

Corrected Second Supplemental Direct Testimony

Rick T. Link

1 available to serve the company's customers by meeting both near-term and long-term
2 needs for additional resources. My second supplemental direct testimony explains the
3 following:

- 4 • The Combined Projects continue to provide net customer benefits under all
5 scenarios studied through 2036, and in seven of the nine scenarios through
6 2050.
- 7 • Customer benefits increase to \$167 million in the medium case through 2050
8 (as compared to \$151 million in the supplemental direct filing), and range from
9 \$357 million to \$405 million in the medium case through 2036.
- 10 • The analysis reflects consideration of an interconnection-restudy process, that:
11 1) eliminated certain bids, including the company's McFadden Ridge II
12 benchmark bid, from consideration in the 2017R RFP; and 2) supported an
13 increase to the assumed level of interconnection capacity in the constrained area
14 of PacifiCorp's system in eastern Wyoming.
- 15 • Sensitivity analysis continues to show substantial benefits of the Combined
16 Projects persist when paired with PacifiCorp's wind repowering project and are
17 not displaced or reduced when considering the potential procurement of solar
18 PPA bids, updated with best-and-final pricing, submitted into the on-going RFP
19 for solar resources, the 2017S RFP.

20 **UPDATED 2017R RFP FINAL SHORTLIST**

21 **Q. Did the company update the list of winning bids from the 2017R RFP?**

22 A. Yes. The company's 109 MW McFadden Ridge II benchmark resource was removed
23 from the final shortlist and replaced with the company's 250 MW Ekola Flats

UPDATED SYSTEM MODELING PRICE-POLICY RESULTS

Q. Please summarize the updated PVRR(d) results calculated from the SO model and PaR through 2036.

A. Table 2-SS summarizes the updated PVRR(d) results for each price-policy scenario alongside the same results summarized in my supplemental direct testimony. The PVRR(d) between cases with and without the Combined Projects, reflecting the updated final shortlist from the 2017R RFP, are shown for the SO model and for PaR, which was used to calculate both the stochastic-mean PVRR(d) and the risk-adjusted PVRR(d). The data used to calculate the updated PVRR(d) results shown in the table are provided as Exhibit RMP___(RTL-2SS).

**CORRECTED Table 2-SS Updated SO Model and PaR PVRR(d)
(Benefit)/Cost of the Combined Projects (\$ million)**

| Price-Policy Scenario | Second Supplemental Direct (Updated Final Shortlist) | | | Supplemental Direct (Original Final Shortlist) | | |
|---------------------------------------|---|--------------------------------------|----------------------------------|---|--------------------------------------|----------------------------------|
| | SO Model PVRR(d) | PaR Stochastic Mean PVRR(d) | PaR Risk- Adjusted PVRR(d) | SO Model PVRR(d) | PaR Stochastic Mean PVRR(d) | PaR Risk- Adjusted PVRR(d) |
| Low Gas, Zero CO ₂ | (\$185) | (\$150) | (\$156) | (\$145) | (\$126) | (\$131) |
| Low Gas, Medium CO ₂ | (\$208) | (\$179) | (\$188) | (\$186) | (\$146) | (\$152) |
| Low Gas, High CO ₂ | (\$370) | (\$337) | (\$355) | (\$297) | (\$280) | (\$294) |
| Medium Gas, Zero CO ₂ | (\$377) | (\$319) | (\$334) | (\$306) | (\$268) | (\$280) |
| Medium Gas, Medium CO ₂ | (\$405) | (\$357) | (\$386) | (\$343) | (\$333) | (\$349) |
| Medium Gas, High CO ₂ | (\$489) | (\$448) | (\$469) | (\$430) | (\$409) | (\$428) |
| High Gas, Zero CO ₂ | (\$699) | (\$568) | (\$596) | (\$619) | (\$531) | (\$557) |
| High Gas, Medium CO ₂ | (\$716) | (\$603) | (\$633) | (\$636) | (\$561) | (\$588) |
| High Gas, High CO ₂ | (\$781) | (\$694) | (\$728) | (\$696) | (\$627) | (\$658) |

1 Over a 20-year period, the Combined Projects reduce customer costs in all nine
2 price-policy scenarios. This outcome is consistent in both the SO model and PaR
3 results. Under the central price-policy scenario, when applying medium natural gas,
4 medium CO₂ price-policy assumptions, the PVRR(d) net benefits range between
5 \$357 million (up from \$333 million), when derived from PaR stochastic-mean results,
6 and \$405 million (up from \$343 million), when derived from SO model results. Net
7 benefits increase relative to those shown in my supplemental direct testimony. This is
8 driven by the increased interconnection capacity associated with the Aeolus-to-
9 Bridger/Anticline transmission line, which enables selection of the Ekola Flats
10 benchmark resource. Without this update, there was not sufficient interconnection
11 capacity to accommodate the Ekola Flats benchmark with the TB Flats I and II and
12 Cedar Springs bids.

13 **Q. Did you update the potential upside to these PVRR(d) results associated with**
14 **renewable energy credit (“REC”) revenues?**

15 A. Yes. Consistent with my direct and supplemental direct testimony, the PVRR(d) results
16 presented in Table 2-SS do not reflect the potential value of RECs generated by the
17 incremental energy output from the updated final shortlist projects. Accounting for the
18 performance estimates from the updated final shortlist projects, customer benefits for
19 all price-policy scenarios would improve by approximately \$34 million (up from
20 \$31 million in my supplemental direct analysis) for every dollar assigned to the
21 incremental RECs that will be generated from the winning bids through 2036.
22 Quantifying the potential upside associated with incremental REC revenues is simply
23 intended to communicate that the net benefits from the winning bids could improve if

1 UPDATED REVENUE REQUIREMENT MODELING PRICE-POLICY RESULTS

2 Q. Please summarize the updated PVRR(d) results calculated from the change in
3 annual revenue requirement through 2050.

4 A. Table 3-SS summarizes the updated PVRR(d) results for each price-policy scenario
5 calculated off of the change in annual nominal revenue requirement through 2050
6 alongside the same results summarized in my supplemental direct testimony. The
7 annual data over the period 2017 through 2050 that was used to calculate the updated
8 PVRR(d) results shown in the table are provided as Exhibit RMP___(RTL-3SS).

9 CORRECTED Table 3-SS. Updated Nominal Revenue Requirement PVRR(d)
(Benefit)/Cost of the Combined Projects (\$ million)

| Price-Policy Scenario | Second Supplemental Direct (Updated Final Shortlist) | Supplemental Direct (Original Final Shortlist) |
|------------------------------------|---|---|
| Low Gas, Zero CO ₂ | \$184 | \$195 |
| Low Gas, Medium CO ₂ | \$127 | \$159 |
| Low Gas, High CO ₂ | (\$147) | (\$79) |
| Medium Gas, Zero CO ₂ | (\$92) | (\$34) |
| Medium Gas, Medium CO ₂ | (\$167) | (\$151) |
| Medium Gas, High CO ₂ | (\$304) | (\$275) |
| High Gas, Zero CO ₂ | (\$448) | (\$411) |
| High Gas, Medium CO ₂ | (\$499) | (\$453) |
| High Gas, High CO ₂ | (\$635) | (\$559) |

10 When system costs and benefits from the Combined Projects are extended out
11 through 2050, covering the full depreciable life of the owned-wind projects included in
12 the updated 2017R RFP final shortlist, the Combined Projects reduce customer costs in
13 seven out of nine price-policy scenarios. Customer net benefits range from \$92 million

1 in the medium natural gas, zero CO₂ price-policy scenario (up from \$34 million) to
2 \$635 million in the high natural gas, high CO₂ price-policy scenario (up from
3 \$559 million). Under the central price-policy scenario, when applying medium natural
4 gas, medium CO₂ price-policy assumptions, the PVRR(d) benefits of the Combined
5 Projects are \$167 million (up from \$151 million). The Combined Projects provide
6 significant customer benefits in all price-policy scenarios, and the net benefits are
7 unfavorable only when low natural-gas prices are paired with zero or medium CO₂
8 prices. These results continue to show that upside benefits far outweigh downside risks.

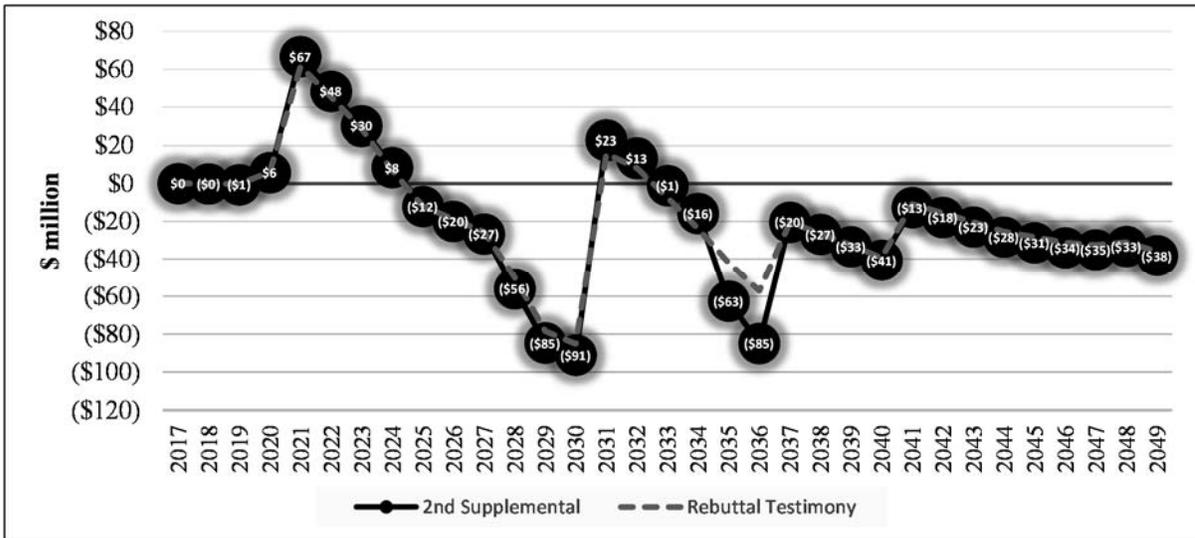
9 As is the case with the system-modeling results, net benefits increase relative
10 to those shown in my supplemental direct testimony. As stated earlier, this is driven by
11 the increased interconnection capacity associated with the Aeolus-to-Bridger/Anticline
12 transmission line, which enables selection of the Ekola Flats benchmark resource.
13 Without this update, there was not sufficient interconnection capacity to accommodate
14 the Ekola Flats benchmark with the TB Flats I and II and Cedar Springs bids.

15 **Q. Is there additional potential upside to these PVRR(d) results associated with REC**
16 **revenues?**

17 A. Yes. Consistent with my direct and supplemental direct testimony, the PVRR(d) results
18 presented in Table 3-SS do not reflect the potential value of RECs generated by the
19 incremental energy output from the Wind Projects. Accounting for the performance
20 estimates from the updated final shortlist projects, customer benefits for all price-policy
21 scenarios would improve by approximately \$43 million (up from \$39 million in my
22 supplemental direct analysis) for every dollar assigned to the incremental RECs that
23 will be generated from the winning bids through 2050.

1 change in NPC, emissions, non-NPC variable costs, and system fixed costs that are
 2 affected by, but not directly associated with, the Combined Projects.

3 **CORRECTED Figure 1-SS Updated Total-System Annual Revenue Requirement
 With the Combined Projects (Benefit)/Cost (\$ million)**



4 The data shown in this figure for the updated economic analysis have the same
 5 basic profile as the data from the economic analysis summarized in my supplemental
 6 direct testimony. Despite a reduction in PTC benefits associated with changes in federal
 7 tax law, the reduced costs from winning bids from the 2017R RFP continue to generate
 8 substantial near-term customer benefits and continue to contribute to customer benefits
 9 over the long term. The Combined Projects produce net benefits in 23 years out of the
 10 30 years that the proposed owned-wind resources selected to the 2017R RFP final
 11 shortlist are assumed to operate.

12 As noted in my supplemental direct testimony, the year-on-year reduction in net
 13 benefits from 2036 to 2037 is driven by the company’s conservative approach to
 14 extrapolate benefits from 2037 through 2050 based on modeled results from the 2028-
 15 through-2036 time frame. This leads to an abrupt reduction in the benefits in 2037, and

1 **CORRECTED Table 4-SS Updated Solar Sensitivity with Solar PPAs Included
in lieu of the Combined Projects (Benefit)/Cost (\$ million)**

| | Sensitivity | Benchmark | Change in |
|--|-------------|-----------|-----------|
| Medium Gas, Medium CO₂ | | | |
| SO Model | (\$343) | (\$405) | \$61 |
| PaR Stochastic Mean | (\$228) | (\$357) | \$129 |
| PaR Risk Adjusted | (\$237) | (\$386) | \$149 |
| Low Gas, Zero CO₂ | | | |
| SO Model | (\$196) | (\$185) | (\$11) |
| PaR Stochastic Mean | (\$139) | (\$150) | \$11 |
| PaR Risk Adjusted | (\$145) | (\$156) | \$11 |

2 In this sensitivity, the SO model selects 1,122 MW of solar PPA bids in the low
3 natural gas, zero CO₂ price-policy scenario and 1,419 MW of solar PPA bids in the
4 medium natural gas, medium CO₂ price-policy scenario. All of the selected solar PPA
5 bids are for projects located in Utah.

6 In the medium natural gas, medium CO₂ price-policy scenario, a portfolio with
7 the Combined Projects delivers greater customer benefits relative to a portfolio that
8 adds solar PPA bids without the Combined Projects. Customer benefits are greater
9 when the resource portfolio includes the Combined Projects without solar PPA bids by
10 \$149 million in the medium natural gas, medium CO₂ price-policy scenario based on
11 the risk-adjusted PaR results. In the low natural gas, zero CO₂ price-policy scenario,
12 the portfolio with the Combined Projects delivers slightly greater customer benefits
13 relative to a portfolio that adds solar PPA bids without the Combined Projects when
14 modeled in PaR, and slightly lower customer benefits when analyzed with the SO
15 model. The decrease in net benefits in the solar PPA portfolio is \$11 million based on
16 the risk-adjusted PaR results.

17 When analyzed without the Combined Projects, the solar PPA bids produce net

1 **CORRECTED Table 5-SS Updated Solar Sensitivity with Solar PPAs Included
With the Combined Projects (Benefit)/Cost (\$ million)**

| | Sensitivity | Benchmark | Change in |
|--|-------------|-----------|-----------|
| Medium Gas, Medium CO₂ | | | |
| SO Model | (\$647) | (\$405) | (\$242) |
| PaR Stochastic Mean | (\$519) | (\$357) | (\$163) |
| PaR Risk Adjusted | (\$543) | (\$386) | (\$157) |
| Low Gas, Zero CO₂ | | | |
| SO Model | (\$312) | (\$185) | (\$127) |
| PaR Stochastic Mean | (\$250) | (\$150) | (\$100) |
| PaR Risk Adjusted | (\$259) | (\$156) | (\$103) |

2 In this sensitivity, the SO model continues to choose the winning bids included
3 in the updated 2017R RFP final shortlist as part of the least-cost bid portfolio. In
4 addition to these wind resource selections, the SO model selects 1,042 MW of solar
5 PPA bids in the low natural gas, zero CO₂ price-policy scenario and 1,419 MW of solar
6 PPA bids in the medium natural gas, medium CO₂ price-policy scenario. Again, all of
7 the selected solar PPA bids are for projects located in Utah.

8 When the solar PPAs are assumed to be pursued in addition to the Combined
9 Projects, total net customer benefits increase. This result is consistent with the
10 company’s expectation expressed during the technical conference conducted on
11 January 17, 2018 that cost-effective solar opportunities would not displace the
12 Combined Projects, but would only potentially add to incremental resource
13 procurement opportunities that might provide net customer benefits. Importantly, this
14 sensitivity produces net benefits that are greater than the net benefits from the
15 Combined Projects without the solar PPAs. This confirms that near-term renewable
16 procurement is not a matter of whether the company should pursue the Combined
17 Projects *or* the solar PPAs, but whether the company should consider both

1 opportunities. At this time, it is clear that the Combined Projects provide significant net
 2 benefits, and that these benefits are not eliminated if the company were to also pursue
 3 solar PPA bids through the 2017S RFP.

4 **WIND REPOWERING SENSITIVITY**

5 **Q. Has the company updated its sensitivity analysis related to the wind repowering**
 6 **project?**

7 A. Yes. The wind repowering sensitivity was updated to reflect the updated final shortlist
 8 and to reflect the most recent cost and performance estimates for the wind repowering
 9 project as described in my supplemental direct testimony filed in Docket No. 20000-
 10 519-EA-17.

11 **Q. What were the results of the updated wind-repowering sensitivity?**

12 A. Table 6-SS summarizes PVRR(d) results for this wind-repowering sensitivity. This
 13 sensitivity was developed using SO model and PaR simulations through 2036 for the
 14 medium natural gas, medium CO₂ and the low natural gas, zero CO₂ price-policy
 15 scenarios. The results are shown alongside the benchmark study in which the Combined
 16 Projects were evaluated without wind repowering.

17 **CORRECTED Table 6-SS Wind Repowering
 Sensitivity (Benefit)/Cost (\$ million)**

| | Sensitivity | Benchmark | Change in |
|--|-------------|-----------|-----------|
| Medium Gas, Medium CO₂ | | | |
| SO Model | (\$608) | (\$405) | (\$204) |
| PaR Stochastic Mean | (\$541) | (\$357) | (\$184) |
| PaR Risk Adjusted | (\$567) | (\$386) | (\$181) |
| Low Gas, Zero CO₂ | | | |
| SO Model | (\$334) | (\$185) | (\$149) |
| PaR Stochastic Mean | (\$281) | (\$150) | (\$131) |
| PaR Risk Adjusted | (\$295) | (\$156) | (\$138) |

1 available to serve the company's customers by meeting both near-term and long-term
2 needs for additional resources. My second supplemental direct testimony explains the
3 following:

- 4 • The Combined Projects continue to provide net customer benefits under all
5 scenarios studied through 2036, and in seven of the nine scenarios through
6 2050.
- 7 • Customer benefits increase to \$~~177151~~196167 million in the medium case through
8 2050 (as compared to \$~~177151~~ million in the supplemental direct filing), and
9 range from \$~~333357~~ million to \$405 million in the medium case through 2036.
- 10 • The analysis reflects consideration of an interconnection-restudy process, that:
11 1) eliminated certain bids, including the company's McFadden Ridge II
12 benchmark bid, from consideration in the 2017R RFP; and 2) supported an
13 increase to the assumed level of interconnection capacity in the constrained area
14 of PacifiCorp's system in eastern Wyoming.
- 15 • Sensitivity analysis continues to show substantial benefits of the Combined
16 Projects persist when paired with PacifiCorp's wind repowering project and are
17 not displaced or reduced when considering the potential procurement of solar
18 PPA bids, updated with best-and-final pricing, submitted into the on-going RFP
19 for solar resources, the 2017S RFP.

20 **UPDATED 2017R RFP FINAL SHORTLIST**

21 **Q. Did the company update the list of winning bids from the 2017R RFP?**

22 A. Yes. The company's 109 MW McFadden Ridge II benchmark resource was removed
23 from the final shortlist and replaced with the company's 250 MW Ekola Flats

UPDATED SYSTEM MODELING PRICE-POLICY RESULTS

Q. Please summarize the updated PVRR(d) results calculated from the SO model and PaR through 2036.

A. Table 2-SS summarizes the updated PVRR(d) results for each price-policy scenario alongside the same results summarized in my supplemental direct testimony. The PVRR(d) between cases with and without the Combined Projects, reflecting the updated final shortlist from the 2017R RFP, are shown for the SO model and for PaR, which was used to calculate both the stochastic-mean PVRR(d) and the risk-adjusted PVRR(d). The data used to calculate the updated PVRR(d) results shown in the table are provided as Exhibit RMP___(RTL-2SS).

**CORRECTED Table 2-SS Updated SO Model and PaR PVRR(d)
(Benefit)/Cost of the Combined Projects (\$ million)**

| Price-Policy Scenario | Second Supplemental Direct (Updated Final Shortlist) | | | Supplemental Direct (Original Final Shortlist) | | |
|---------------------------|---|--------------------------------------|----------------------------------|---|--------------------------------------|----------------------------------|
| | SO Model PVRR(d) | PaR Stochastic Mean PVRR(d) | PaR Risk- Adjusted PVRR(d) | SO Model PVRR(d) | PaR Stochastic Mean PVRR(d) | PaR Risk- Adjusted PVRR(d) |
| Low Gas, Zero CO2 | (\$185) | (\$126150) | (\$132156) | (\$145) | (\$104126) | (\$109131) |
| Low Gas, Medium CO2 | (\$208) | (\$155179) | (\$164188) | (\$186) | (\$124146) | (\$131152) |
| Low Gas, High CO2 | (\$370) | (\$313337) | (\$334355) | (\$297) | (\$258280) | (\$272294) |
| Medium Gas, Zero CO2 | (\$377) | (\$295319) | (\$310334) | (\$306) | (\$246268) | (\$258280) |
| Medium Gas, Medium CO2 | (\$405) | (\$333357) | (\$362386) | (\$343) | (\$311333) | (\$327349) |
| Medium Gas, High CO2 | (\$489) | (\$424448) | (\$445469) | (\$430) | (\$388409) | (\$406428) |
| High Gas, Zero CO2 | (\$699) | (\$545568) | (\$572596) | (\$619) | (\$509531) | (\$535557) |
| High Gas, Medium CO2 | (\$716) | (\$579603) | (\$609633) | (\$636) | (\$539561) | (\$567588) |
| High Gas, High CO2 | (\$781) | (\$671694) | (\$705728) | (\$696) | (\$605627) | (\$636658) |

1 Over a 20-year period, the Combined Projects reduce customer costs in all nine
2 price-policy scenarios. This outcome is consistent in both the SO model and PaR
3 results. Under the central price-policy scenario, when applying medium natural gas,
4 medium CO₂ price-policy assumptions, the PVRR(d) net benefits range between
5 ~~\$333333~~ million (up from ~~\$344333~~ million), when derived from PaR stochastic-mean
6 results, and \$405 million (up from \$343 million), when derived from SO model results.
7 Net benefits increase relative to those shown in my supplemental direct testimony. This
8 is driven by the increased interconnection capacity associated with the Aeolus-to-
9 Bridger/Anticline transmission line, which enables selection of the Ekola Flats
10 benchmark resource. Without this update, there was not sufficient interconnection
11 capacity to accommodate the Ekola Flats benchmark with the TB Flats I and II and
12 Cedar Springs bids.

13 **Q. Did you update the potential upside to these PVRR(d) results associated with**
14 **renewable energy credit (“REC”) revenues?**

15 A. Yes. Consistent with my direct and supplemental direct testimony, the PVRR(d) results
16 presented in Table 2-SS do not reflect the potential value of RECs generated by the
17 incremental energy output from the updated final shortlist projects. Accounting for the
18 performance estimates from the updated final shortlist projects, customer benefits for
19 all price-policy scenarios would improve by approximately \$34 million (up from
20 \$31 million in my supplemental direct analysis) for every dollar assigned to the
21 incremental RECs that will be generated from the winning bids through 2036.
22 Quantifying the potential upside associated with incremental REC revenues is simply
23 intended to communicate that the net benefits from the winning bids could improve if

1 **UPDATED REVENUE REQUIREMENT MODELING PRICE-POLICY RESULTS**

2 **Q. Please summarize the updated PVRR(d) results calculated from the change in**
 3 **annual revenue requirement through 2050.**

4 A. Table 3-SS summarizes the updated PVRR(d) results for each price-policy scenario
 5 calculated off of the change in annual nominal revenue requirement through 2050
 6 alongside the same results summarized in my supplemental direct testimony. The
 7 annual data over the period 2017 through 2050 that was used to calculate the updated
 8 PVRR(d) results shown in the table are provided as Exhibit RMP___(RTL-3SS).

9 **CORRECTED Table 3-SS. Updated Nominal Revenue Requirement PVRR(d)**
(Benefit)/Cost of the Combined Projects (\$ million)

| Price-Policy Scenario | Second Supplemental Direct (Updated Final Shortlist) | Supplemental Direct (Original Final Shortlist) |
|------------------------------------|--|--|
| Low Gas, Zero CO ₂ | \$155184 | \$169195 |
| Low Gas, Medium CO ₂ | \$98127 | \$133159 |
| Low Gas, High CO ₂ | (\$176147) | (\$10579) |
| Medium Gas, Zero CO ₂ | (\$12192) | (\$6034) |
| Medium Gas, Medium CO ₂ | (\$196167) | (\$177151) |
| Medium Gas, High CO ₂ | (\$333304) | (\$301275) |
| High Gas, Zero CO ₂ | (\$477448) | (\$437411) |
| High Gas, Medium CO ₂ | (\$528499) | (\$479453) |
| High Gas, High CO ₂ | (\$664635) | (\$585559) |

10 When system costs and benefits from the Combined Projects are extended out
 11 through 2050, covering the full depreciable life of the owned-wind projects included in
 12 the updated 2017R RFP final shortlist, the Combined Projects reduce customer costs in
 13 seven out of nine price-policy scenarios. Customer net benefits range from ~~\$12192~~

1 million in the medium natural gas, zero CO₂ price-policy scenario (up from \$~~6034~~
2 million) to \$~~664635~~ million in the high natural gas, high CO₂ price-policy scenario (up
3 from \$~~585559~~ million). Under the central price-policy scenario, when applying
4 medium natural gas, medium CO₂ price-policy assumptions, the PVRR(d) benefits of
5 the Combined Projects are \$~~196167~~ million (up from \$~~177151~~ million). The Combined
6 Projects provide significant customer benefits in all price-policy scenarios, and the net
7 benefits are unfavorable only when low natural-gas prices are paired with zero or
8 medium CO₂ prices. These results continue to show that upside benefits far outweigh
9 downside risks.

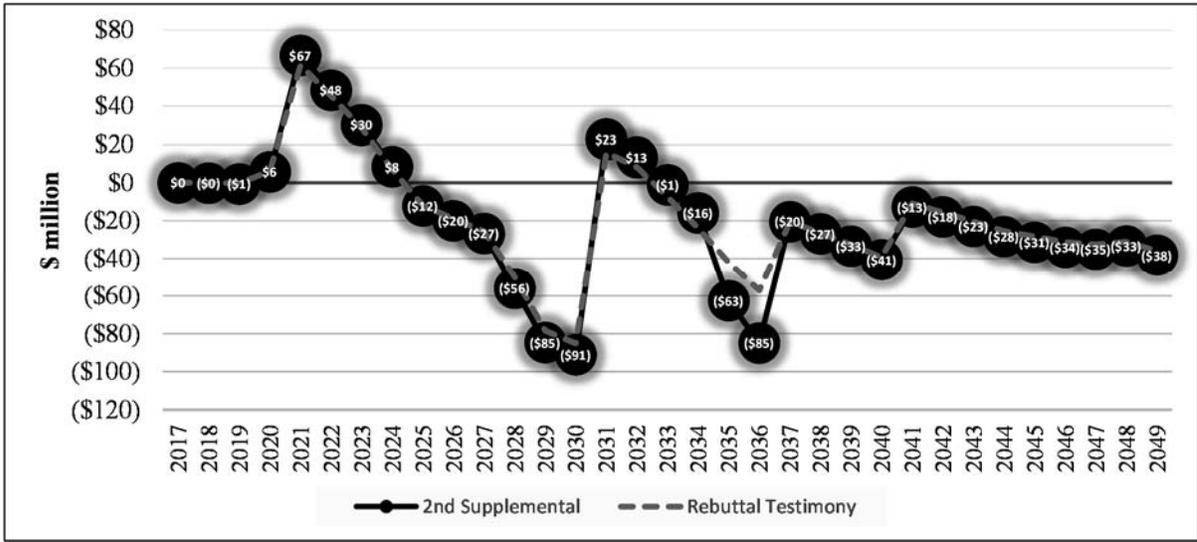
10 As is the case with the system-modeling results, net benefits increase relative
11 to those shown in my supplemental direct testimony. As stated earlier, this is driven by
12 the increased interconnection capacity associated with the Aeolus-to-Bridger/Anticline
13 transmission line, which enables selection of the Ekola Flats benchmark resource.
14 Without this update, there was not sufficient interconnection capacity to accommodate
15 the Ekola Flats benchmark with the TB Flats I and II and Cedar Springs bids.

16 **Q. Is there additional potential upside to these PVRR(d) results associated with REC**
17 **revenues?**

18 A. Yes. Consistent with my direct and supplemental direct testimony, the PVRR(d) results
19 presented in Table 3-SS do not reflect the potential value of RECs generated by the
20 incremental energy output from the Wind Projects. Accounting for the performance
21 estimates from the updated final shortlist projects, customer benefits for all price-policy
22 scenarios would improve by approximately \$43 million (up from \$39 million in my
23 supplemental direct analysis) for every dollar assigned to the incremental RECs that

1 are netted against updated system impacts from the Combined Projects, reflecting the
 2 change in NPC, emissions, non-NPC variable costs, and system fixed costs that are
 3 affected by, but not directly associated with, the Combined Projects.

4 **CORRECTED Figure 1-SS Updated Total-System Annual Revenue Requirement
 With the Combined Projects (Benefit)/Cost (\$ million)**



5 The data shown in this figure for the updated economic analysis have the same
 6 basic profile as the data from the economic analysis summarized in my supplemental
 7 direct testimony. Despite a reduction in PTC benefits associated with changes in federal
 8 tax law, the reduced costs from winning bids from the 2017R RFP continue to generate
 9 substantial near-term customer benefits and continue to contribute to customer benefits
 10 over the long term. The Combined Projects produce net benefits in 23 years out of the
 11 30 years that the proposed owned-wind resources selected to the 2017R RFP final
 12 shortlist are assumed to operate.

13 As noted in my supplemental direct testimony, the year-on-year reduction in net
 14 benefits from 2036 to 2037 is driven by the company's conservative approach to
 15 extrapolate benefits from 2037 through 2050 based on modeled results from the 2028-

1 Projects were evaluated without solar PPA bids.

2 **CORRECTED Table 4-SS Updated Solar Sensitivity with Solar PPAs Included
in lieu of the Combined Projects (Benefit)/Cost (\$ million)**

| | Sensitivity | Benchmark | Change in |
|--|-----------------------|-----------------------|---------------------|
| Medium Gas, Medium CO₂ | | | |
| SO Model | (\$343) | (\$405) | \$61 |
| PaR Stochastic Mean | (\$206228) | (\$333357) | \$127129 |
| PaR Risk Adjusted | (\$216237) | (\$362386) | \$146149 |
| Low Gas, Zero CO₂ | | | |
| SO Model | (\$196) | (\$185) | (\$11) |
| PaR Stochastic Mean | (\$123139) | (\$126150) | \$311 |
| PaR Risk Adjusted | (\$130145) | (\$132156) | \$311 |

3 In this sensitivity, the SO model selects 1,122 MW of solar PPA bids in the low
4 natural gas, zero CO₂ price-policy scenario and 1,419 MW of solar PPA bids in the
5 medium natural gas, medium CO₂ price-policy scenario. All of the selected solar PPA
6 bids are for projects located in Utah.

7 In the medium natural gas, medium CO₂ price-policy scenario, a portfolio with
8 the Combined Projects delivers greater customer benefits relative to a portfolio that
9 adds solar PPA bids without the Combined Projects. Customer benefits are greater
10 when the resource portfolio includes the Combined Projects without solar PPA bids by
11 ~~\$146149~~ million in the medium natural gas, medium CO₂ price-policy scenario based
12 on the risk-adjusted PaR results. In the low natural gas, zero CO₂ price-policy scenario,
13 the portfolio with the Combined Projects delivers slightly greater customer benefits
14 relative to a portfolio that adds solar PPA bids without the Combined Projects when
15 modeled in PaR, and slightly lower customer benefits when analyzed with the SO
16 model. The decrease in net benefits in the solar PPA portfolio is ~~\$311~~ million based on
17 the risk-adjusted PaR results.

**CORRECTED Table 5-SS Updated Solar Sensitivity with Solar PPAs Included
With the Combined Projects (Benefit)/Cost (\$ million)**

| | Sensitivity | Benchmark | Change in |
|--|-----------------------|-----------------------|-----------------------|
| Medium Gas, Medium CO₂ | | | |
| SO Model | (\$647) | (\$405) | (\$242) |
| PaR Stochastic Mean | (\$455519) | (\$333357) | (\$122163) |
| PaR Risk Adjusted | (\$479543) | (\$362386) | (\$116157) |
| Low Gas, Zero CO₂ | | | |
| SO Model | (\$312) | (\$185) | (\$127) |
| PaR Stochastic Mean | (\$197250) | (\$126150) | (\$71100) |
| PaR Risk Adjusted | (\$206259) | (\$132156) | (\$74103) |

In this sensitivity, the SO model continues to choose the winning bids included in the updated 2017R RFP final shortlist as part of the least-cost bid portfolio. In addition to these wind resource selections, the SO model selects 1,042 MW of solar PPA bids in the low natural gas, zero CO₂ price-policy scenario and 1,419 MW of solar PPA bids in the medium natural gas, medium CO₂ price-policy scenario. Again, all of the selected solar PPA bids are for projects located in Utah.

When the solar PPAs are assumed to be pursued in addition to the Combined Projects, total net customer benefits increase. This result is consistent with the company's expectation expressed during the technical conference conducted on January 17, 2018 that cost-effective solar opportunities would not displace the Combined Projects, but would only potentially add to incremental resource procurement opportunities that might provide net customer benefits. Importantly, this sensitivity produces net benefits that are greater than the net benefits from the Combined Projects without the solar PPAs. This confirms that near-term renewable procurement is not a matter of whether the company should pursue the Combined Projects *or* the solar PPAs, but whether the company should consider both

1 opportunities. At this time, it is clear that the Combined Projects provide significant net
 2 benefits, and that these benefits are not eliminated if the company were to also pursue
 3 solar PPA bids through the 2017S RFP.

4 **WIND REPOWERING SENSITIVITY**

5 **Q. Has the company updated its sensitivity analysis related to the wind repowering**
 6 **project?**

7 A. Yes. The wind repowering sensitivity was updated to reflect the updated final shortlist
 8 and to reflect the most recent cost and performance estimates for the wind repowering
 9 project as described in my supplemental direct testimony filed in Docket No. 20000-
 10 519-EA-17.

11 **Q. What were the results of the updated wind-repowering sensitivity?**

12 A. Table 6-SS summarizes PVRR(d) results for this wind-repowering sensitivity. This
 13 sensitivity was developed using SO model and PaR simulations through 2036 for the
 14 medium natural gas, medium CO₂ and the low natural gas, zero CO₂ price-policy
 15 scenarios. The results are shown alongside the benchmark study in which the Combined
 16 Projects were evaluated without wind repowering.

17 **CORRECTED Table 6-SS Wind Repowering
 Sensitivity (Benefit)/Cost (\$ million)**

| | Sensitivity | Benchmark | Change in |
|--|-----------------------|-----------------------|-----------|
| Medium Gas, Medium CO₂ | | | |
| SO Model | (\$608) | (\$405) | (\$204) |
| PaR Stochastic Mean | (\$517541) | (\$333357) | (\$184) |
| PaR Risk Adjusted | (\$543567) | (\$362386) | (\$181) |
| Low Gas, Zero CO₂ | | | |
| SO Model | (\$334) | (\$185) | (\$149) |
| PaR Stochastic Mean | (\$257281) | (\$126150) | (\$131) |
| PaR Risk Adjusted | (\$271295) | (\$132156) | (\$138) |