

Rocky Mountain Power
Docket No. 14-035-114
Witness: Michael G. Wilding

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Rebuttal Testimony of Michael G. Wilding

July 2017

1 **Q. Are you the same Michael G. Wilding who submitted direct testimony on behalf**
2 **of the Company in this proceeding?**

3 A. Yes.

4 **Q. What is the purpose of your rebuttal testimony?**

5 A. My testimony presents and supports certain updates to the Company’s net power cost
6 (“NPC”) analysis of the net metering program (“NEM Program”) for the 12-month
7 period from January 1, 2015 through December 31, 2015 (“Study Period”).
8 Specifically, I discuss NPC results with: 1) updated integration costs based on the
9 2017 Integrated Resource Plan (“IRP”), and 2) the addition of variable operations and
10 maintenance (“O&M”) costs for coal and gas plant operation.

11 In addition, my testimony responds to issues raised by the Energy Freedom
12 Coalition of America witness Eliah Gilfenbaum, HEAL Utah witness Jeremy Fisher,
13 Vivint Solar (“Vivint”) witnesses Tom Plagemann and Richard Collins, and Vote Solar
14 witness David DeRamus. In particular, I address the following:

15 1. Integration Costs – Vivint, Vote Solar, and HEAL Utah point out that the integration
16 cost assumptions used in the NPC analysis are higher than those in the 2017 IRP.¹

17 The Company concurs and the NPC analysis has been updated to be consistent with
18 the recently filed 2017 IRP of \$0.60/MWh.

19 2. Variable O&M Costs – HEAL Utah, Vivint, and Vote Solar recommend the
20 Company include variable O&M production costs in our unit dispatch costs.² The

¹ Vivint Solar witness Richard Collins Direct Testimony, ll. 529-57; Vote Solar witness David W. DeRamus Direct Testimony, ll. 878-81; HEAL Utah witness Jeremy Fisher Direct Testimony p. 9-10.

² Collins Direct Testimony, ll. 490-504; DeRamus Direct Testimony, ll. 876-7.

21 NPC analysis has been updated to include annual variable O&M costs for coal and
22 gas units.

23 3. NPC Analysis – The parties shared a common concern that the NPC analysis does
24 not capture all benefits of the NEM Program. Specifically, I address the following:

25 • Capacity benefit provided by the NEM Program: The Company is resource
26 sufficient until 2029 and therefore the capacity benefit is properly captured in
27 the NPC analysis.

28 • Resource mix to serve incremental load: The Company used its Generation and
29 Regulation Initiative Decision Tools (“GRID”) production cost model to
30 determine the resource mix to serve incremental load associated with the NEM
31 Program. GRID has been used in all general rate cases since 2003. The costs
32 associated with each resource type are 2015 actual NPC.

33 **Updated NPC Analysis**

34 **Q. Has the Company updated its NPC analysis and provided supporting exhibits and**
35 **workpapers?**

36 **A.** Yes. Exhibit RMP___(MGW-1R) contains the updated NPC analysis of the NEM
37 Program for the Study Period, which includes the solar integration cost from the
38 2017 IRP and variable O&M costs.

39 **Q. What is the result of the updated NPC analysis?**

40 **A.** Updating the NPC analysis to include variable O&M and the solar integration costs
41 from the 2017 IRP increases the NPC benefit to \$24.87/MWh, or \$1.44 million as seen
42 in Lines 45 and 46 of Exhibit RMP___(MGW-1R) and summarized in Table 1 below.
43 The difference from the original filing is approximately \$150,000.

TABLE 1
2015 NPC NEM Analysis

NPC Component	Change (MWh)	2015 Actual NPC Weighted (\$/MWh)	2015 NPC Benefit of Solar
System Balancing Sales	22,471	\$ 9.90	
System Balancing Purchases	17,233	\$ 7.60	
Coal Generation/Fuel Expense + Variable O&M	16,900	\$ 7.45	
Natural Gas Generation/Fuel Expense + Variable O&M	1,182	\$ 0.52	
Integration Costs		\$ (0.60)	
Total	57,785	\$ 24.87	\$ 1,437,202

44 **Integration Costs**

45 **Q. Why did the Company update the integration costs from its previous filing?**

46 A. Vivint, Vote Solar, and HEAL Utah each proposed the NPC analysis be updated to
 47 reflect the solar integration costs from the recently filed IRP. At the time of the
 48 compliance filing in November 2016, the NPC analysis referenced the most current
 49 source for integration costs previously approved by the Commission in Docket
 50 No. 12-035-100 (the “QF Docket”).³ On April 4, 2017, the Company filed its 2017 IRP
 51 which reflects the Company’s current assumptions about future costs. Solar integration
 52 costs were updated from \$2.83/MWh to \$0.60/MWh,⁴ which results in an increased
 53 benefit for the NEM Program. The 2017 IRP has not yet been acknowledged by the
 54 Commission, but the Company is updating to provide the most current integration
 55 costs.

³ See Docket No. 12-035-100, Order on Phase II Issues, at 34 (Utah P.S.C. August 16, 2013). In the QF Docket, the Commission approved, among other things, solar integration charges the equivalent of 65 percent and 50 percent of wind integration charges for fixed solar and tracking solar resources, respectively, from the Company's 2012 Wind Integration Study (the "Phase II Order").

⁴ Integrated Resource Plan - Volume II, Appendices, Appendix F - Flexible Reserve Study, p. 75. The IRP has integration cost of \$0.60/MWh (see Exhibit RMP__(MGW-1R) line 44).

56 **Variable O&M Costs**

57 **Q. How were the variable O&M costs included in the analysis?**

58 A. To the extent that the NEM program avoids variable O&M costs, the annual weighted
59 average variable O&M cost for coal and natural gas plants were added to the 2015
60 actual unit costs for coal and natural gas, respectively. This is reflected in Lines 38 and
61 39 of Exhibit RMP___(MGW-1R). The result was an annual weighted average variable
62 O&M cost of \$1.22/MWh for coal plants and \$0.24/MWh for gas plants, respectively.

63 **Q. What costs are included in variable O&M costs?**

64 A. The variable O&M costs for natural gas plants are comprised of chemical costs and
65 water. The variable O&M costs for coal plants include chemical costs and ash handling.

66 **NPC Analysis**

67 **Q. Did the Company consider the impact of the NEM Program on avoided generation**
68 **capacity?**

69 A. Yes. There are no avoided capacity costs from the NEM Program generation because
70 there are no deferrable capacity investments. The carrying cost of new generation
71 capacity should be included only during periods of resource deficiency requiring
72 capacity investments. Deficiency period is identified as the next major thermal resource
73 acquisition in the Company's latest IRP filing. In the recent update to Utah Schedule 37
74 tariff filing, the deficiency period is 2029 based on the first major thermal resource in
75 the 2017 IRP.⁵

76 In addition, when the GRID model is used to calculate the marginal cost of
77 energy, as was done in this case, the marginal energy costs capture the ability of the

⁵ See Docket No. 17-035-T07, RMP updated schedule 37 Tariff Sheets Using Current Methodology.

78 capacity resource to be dispatched into the market, as well as any reduction in market
79 sales related to the deferral of such capacity, therefore no additional adjustment is
80 needed.

81 **Q. Can the capacity value of the NEM Program be valued using the California Public
82 Utility Commission (“CPUC”) resource adequacy (“RA”) process?**

83 A. No. Vivint suggests the capacity of the NEM Program be valued using the CPUC RA
84 process because PacifiCorp has available transmission into California. The value used
85 for capacity pricing is a California Independent System Operator (“CAISO”) price and
86 the Company is not a member of the CAISO. In fact, the source of the capacity pricing
87 is a technical report discussing the benefits of integration with CAISO.⁶ In addition,
88 the Company neither owns nor controls the NEM program resources and therefore the
89 Company would not be able to bid the resources into a capacity market. Furthermore,
90 the Company uses its resources to serve load and not to bid into CAISO.

91 **Q. How did the Company determine the resource mix that would serve the
92 incremental load if there was no generation from the NEM Program?**

93 A. The Company performed two GRID studies, a base study and a study without
94 generation from the NEM Program (“No NEM Study”), and compared the change in
95 resources between the two studies. The study period was calendar year 2015, consistent
96 with the Commission’s November 10, 2015 Order.⁷

97 **Q. Can you please provide an overview of what the GRID model does?**

98 A. GRID is an hourly production cost dispatch model that dispatches PacifiCorp resources

⁶ <https://www.caiso.com/Documents/Study-TechnicalAppendix-Benefits-PacifiCorp-ISOIntegration.PDF>.

⁷ See Docket No. 14-035-114, Order (November 10, 2015), where the Commission adopted the analytical framework.

99 to serve its load obligation through the most economic means possible given the
100 constraints of the Company's system. GRID has been used in every GRC the Company
101 has filed in Utah since 2003.

102 **Q. Does GRID choose the highest cost resource to serve incremental load in the No**
103 **NEM Study?**

104 A. No. The GRID model optimizes all Company resources to meet the additional load at
105 the lowest possible cost. Vote Solar states that “[i]t is more reasonable to expect that
106 the output from the [distribute generation] reduces the marginal (highest cost) output
107 at the top of the stack.”⁸ The No NEM study did choose the marginal resource but this
108 is not the same as the highest cost. For example, the next resource in the stack with
109 available capacity was a coal unit, however there are more expensive resources that are
110 either being used to hold reserves or are not dispatched for economic purposes.

111 **Q. Vote Solar claims there is an error in the NPC analysis because GRID uses an**
112 **average heat rate rather than a marginal heat rate.⁹ Please explain the heat rate**
113 **function in the GRID model.**

114 A. A heat rate curve identifying a unit's heat rate as a function of unit output is input into
115 the GRID model, and the dispatch is based on the incremental/marginal heat rate over
116 a unit's dispatchable range (i.e. the average incremental/marginal heat rate between
117 minimum and maximum dispatch). This allows a unit's dispatch cost to be reflected as
118 a single value which is necessary for computation in the linear program logic. After a
119 unit's hourly dispatch is determined, the GRID model reports fuel consumption based

⁸ DeRamus Direct Testimony, ll. 874-6.

⁹ DeRamus Direct Testimony, l. 877.

120 on the heat rate specific to that level of dispatch.

121 **Q. What is the source of the costs associated with the change in resources in the NPC**
122 **analysis?**

123 A. The costs used in the NPC analysis are the 2015 actual NPC. HEAL Utah points out
124 some differences in costs in the GRID studies and actuals;¹⁰ however, these differences
125 are inconsequential as the NPC analysis relies on actual NPC.

126 **Q. Does this conclude your direct testimony?**

127 A. Yes.

¹⁰ Fisher Direct Testimony, p.12.