BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Application of Rocky	:	Docket No. 12-035-100
Mountain Power for Approval of Changes to	:	
Renewable Avoided Cost Methodology for	:	Phase 2
Qualifying Facilities Projects Larger than	:	
Three Megawatts	:	All Other Issues

SURREBUTTAL TESTIMONY OF

RANDALL J. FALKENBERG

ON BEHALF OF THE

OFFICE OF CONSUMER SERVICES

May 30, 2013

1   **Q.   PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2   A.   Randall J. Falkenberg, PMB 362, 8343 Roswell Road, Sandy Springs, Georgia 30350. I

3   am the same witness who filed direct and rebuttal testimony in this proceeding.

4   **Q.   WHAT IS THE PURPOSE OF THIS SURREBUTTAL TESTIMONY?**

5   A.   I provide limited comments on the rebuttal testimony of Utah Clean Energy witness

6   Wright, Division of Public Utilities ("DPU or Division") witness Abdulle and Rocky

7   Mountain Power ("Company") witness Duvall.

8   **Utah Clean Energy Witness Wright**

9   **Q.   STARTING AT LINE 244 MS. WRIGHT ADVOCATES PAYING QFS AN**
10   **"UNCAPPED ENERGY PRICE" RATHER THAN A "CAPPED" PRICE AS IS**
11   **DONE UNDER THE CURRENT PDDRR METHOD. DO YOU AGREE?**
12
13   A.   No. Once QFs are receiving the capacity payment, they are being paid to supply energy

14   based on the capital and operating costs of the avoided unit. Energy payments are the

15   lesser of the market energy price (as determined by GRID) or the variable cost of the

16   avoided unit. Under her proposal, QFs would have the "best of both worlds" – the high

17   capacity cost of the avoided unit, and the market energy cost even if the resulting payment

18   rate exceeds the variable cost of the avoided unit. However, the avoided unit is included in

19   the expansion plan because of the energy savings it produces compared to market

20   purchases. If the avoided unit costs the same as market energy there would be no reason to

21   incur the cost of building the resource.

22   **Q.   CAN YOU PROVIDE AN EXAMPLE THAT ILLUSTRATES THIS POINT?**

23   A.   Yes. To see why this is a problem, consider a hypothetical situation where the market

24   energy price is $40/MWH, and the variable cost of the avoided unit is $30/MWH. Assume

25   also that the capacity cost of the avoided unit is $120/kW-year. In that case, the "all in

26   cost" of the avoided unit would be $44.4/MWH.[1] This is what it would cost the utility to

27   provide the energy produced by the avoided unit. Under Ms. Wright's proposal the QF

28   would be paid $54.4/MWH because it would get the energy cost from the market

29   ($40/MWH) instead of the variable cost of the avoided unit ($30/MWH.) Consequently,

30   customers would be charged $54.4/MWH for energy the utility could have produced itself

31   for $44.4/MWH.

32 **Q. HOW WOULD MS. WRIGHTS' PROPOSAL WORK IN THE EVENT THAT A**
33   **WIND RESOURCE BECAME THE AVOIDED UNIT?**
34
35 A.   While this is a rather unlikely scenario at present, it does illustrate the inequity of her

36   proposal.[2] Assume that as in the above example, the market energy price is $40/MWH,

37   and that the cost of a wind project on an all-in basis was $39/MWH (capital and O&M net

38   of production tax credits.) Under Ms. Wright's proposal, the wind QFs would be paid

39     $39/MWH for the avoided unit's fixed costs plus $40/MWH for the market energy cost, or

40     $79/MWH.   However, for the utility to supply the same energy would only cost

41     $39/MWH. Consequently, her proposal would violate the PURPA ratepayer neutrality

42   requirement.

43 **Q. MS. WRIGHT CONTINUES TO SUPPORT THE USE OF THE MARKET PROXY**
44   **METHOD WHEN RENEWABLES ARE PART OF THE IRP PREFERRED**
45   **PORTFOLIO. HAS SHE INTRODUCED ANY NEW EVIDENCE IN SUPPORT**
46   **OF HER POSITION?**
47
48 A.   No. Her testimony is simply not persuasive. As pointed out in my direct and rebuttal

49   testimony, there are too many problems with the market proxy method to continue to use it

50   in any situation. Because renewable resources are not now part of the preferred portfolio

51   and may not be in the preferred portfolio for some time, this is a rather academic question.

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[1]   This assumes a 95% capacity factor. The capacity cost is $120/8760/.95 = .0144 $/kWh, or $14.4 $/MWH. When added to the variable cost the result is $44.4/MWH.

[2]   While seemingly unlikely, this scenario could occur, for example, if Production Tax Credits ("PTCs") were substantially increased and/or Utah implemented a Renewable Portfolio Standard**.**

52   The PDDRR method produces reasonable avoided costs whether or not renewable

53   resources are part of the preferred portfolio.

54   **DPU Witness Abdulle**

55   **Q.   DR. ABDULLE CRITICIZES THE METHOD YOU PROPOSE TO DETERMINE**
56   **   THE CAPACITY VALUE FOR INTERMITTENT RESOURCES.   DO YOU**
57   **   AGREE WITH HIS CRITICISMS?**
58
59   A.   No. Dr. Abdulle testifies as follows:

60   The results of this method depend on the difference between the thermal alone load-
61   serving capacity and the thermal-wind load-serving capacity. These two values need to be
62   matched in such a way that they both belong to the same hour of the same day and month
63   in the same year. Failure to match these values in this manner would, inevitably, result in
64   an over or under estimation of the amount of additional wind needed to serve the load.
65   (Abdulle Rebuttal page 3.)
66
67   Dr. Abdulle's assertion is incorrect. In a reliability analysis, the goal is to

68   determine the risk of shortages, or the number of shortage events, not necessarily when

69   they occur. Addition of substantial renewable resources to a thermal system will change

70   the timing of shortage conditions because the pattern of available capacity for wind and

71   solar, differs from that of thermal. The time when a thermal system is short on capacity

72   depends on load and the availability of thermal resources. Because thermal resources are

73   mechanical devices, there is no reason to expect a specific temporal pattern to unplanned

74   outages. This is not the case for renewable generation, which will follow seasonal and

75   diurnal patterns.

76   If wind (or solar) resources are added to the system, the timing of shortages will

77   depend on the available capacity of the <u>combined</u> wind and thermal resources. As there is

78   no reason to assume that the available wind and thermal capacity will be correlated, in

79   some cases thermal shortages will be offset by a wind surplus, and vice-versa.

80   Consequently, the times when shortages will occur depends on when the sum of wind and

81   thermal output is smallest. This will not necessarily occur at the same time when thermal

82   capacity is lowest, as Dr. Abdulle suggests.

83   **Q.   CAN YOU PROVIDE AN EXAMPLE TO ILLUSTRATE THIS?**

84   A.   Figures 1S below shows wind, thermal and the combined wind plus thermal capacity

85   available based on some of the Company's hourly availability data but scaled to 5000 MW

86   installed capacity for thermal and 2000 MW for wind.[3]   The figure shows that the

87   minimum thermal capacity is 4068 MW at hour 13. In hour 13, if wind is included, the

88   total capacity available is 4846 MW, an increase of 778 MW (4846-4068). Dr. Abdulle's

89   testimony suggests this is the increased amount of load that wind allows to be served.

90   However, when wind resources are combined with thermal, the time of the minimum

91   available capacity shifts from hour 13 to hour 23 and the combined (thermal + wind)

92   amount would now be 4601 MW. The increased capacity due to wind at hour 13 (778

93   MW) does not represent the actual amount of load that could be served due to wind.

94   Rather, inclusion of wind increases the minimum (combined wind and thermal) capacity

95   available to only 4601 MW at hour 23. This is an increase of 533 (4601-4068) MW not

96   778 MW as suggested by Dr. Abdulle.   The analysis I performed used this sort of

97   comparison to determine how much load serving ability wind adds to the supply mix,

98   given a reserve margin target (ranging from 12%-16%) which implies a specific number of

99   shortages. Consequently, there is no need to match the hours of the comparison of load

100   serving capability as suggested by Dr. Abdulle, and in fact, it would produce the wrong

101   answer.

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[3]   This scaling is intended to preserve confidentiality (avoiding the need to redact the results) and to make the illustration more obvious.

Figure 1S: Illustration of Wind Capacity Contribution
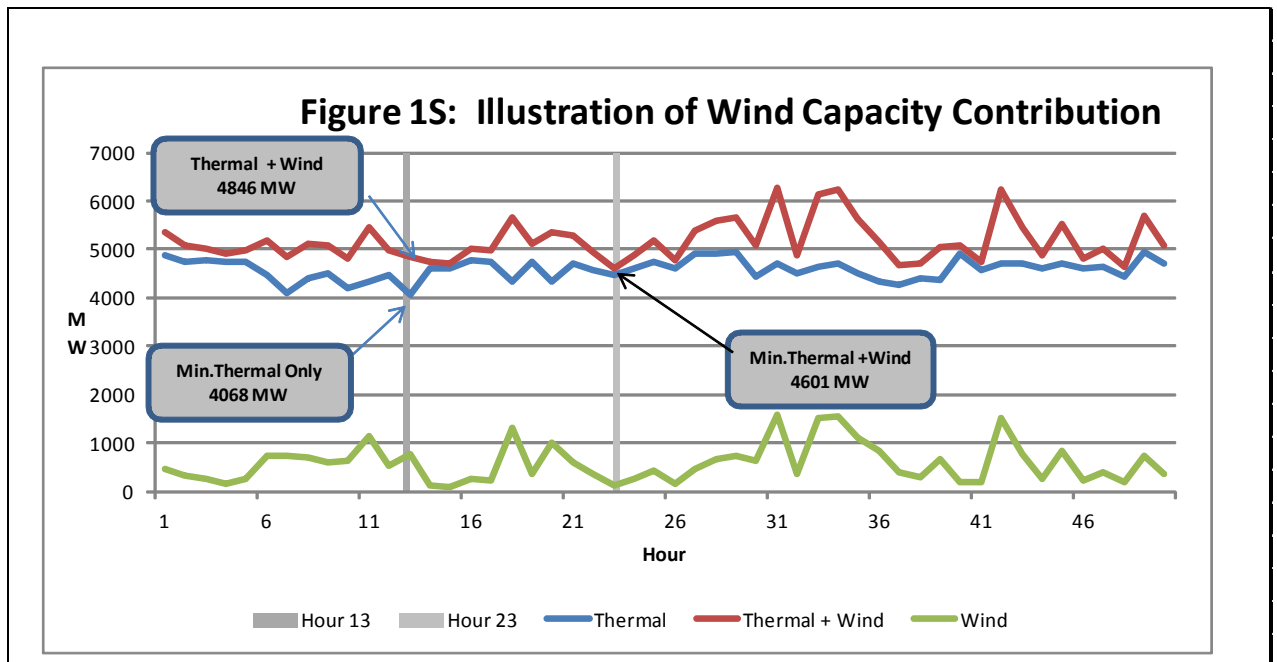
102
103

104 **Q.** **ON PAGE 4, LINE 74, DR. ABDULLE CRITICIZES YOUR APPROACH ON THE**
105   **BASIS THAT EVEN IF CORRECTED FOR THE MATCHING PROBLEM, IT**
106   **WOULD PRODUCE UNRELIABLE RESULTS. PLEASE COMMENT.**
107
108 A.   This criticism depends on his conclusion that not "matching" the hours is an error and must

109   be corrected. As shown above, this is an incorrect assertion on his part.

110 **Q.** **DR. ABDULLE RECOMMENDS USE OF A RELIABILITY BASED METHOD TO**
111   **DETERMINE THE CAPACITY VALUES FOR INTERMITTENT RESOURCES.**
112   **DO YOU AGREE?**
113
114 A.   Yes. While I believe the method I have proposed would produce reasonable results, given

115   the amount of research and analysis already conducted within the industry on this issue, it

116   would be preferable to use one of the methods documented in the NREL Report Ms.

117   Wright provided, or the IEEE paper attached to Dr. Abdulle's testimony. I see no reason

118   one of those methods could not be implemented in this case, and recommend the

119   Commission order the Company to do so. The record in this docket is sufficiently

120   developed for the Commission to reach a decision. In my rebuttal testimony, I provided

121   calculations based on the simplest of the NREL methods. These figures could be used in

122   this case as an alternative should the Company claim it is not possible to perform the

123   analysis directed by the Commission. Further, my originally proposed method is also a

124   reasonable and readily available alternative for wind.

125   **Q.   DR. ABDULLE PROPOSES THAT A RANGE OF ALTERNATIVE RESULTS**
126   **BASED ON HIS OWN ANALYSIS BE APPLIED ON AN INTERIM BASIS. DO**
127   **YOU AGREE WITH HIS RECOMMENDATION?**
128
129   A.   No. Dr. Abdulle's methodology lacks any foundation in either reliability or statistical

130   analysis. His approach consists of various ad-hoc weightings of the results from the 500

131   hours of historical data. The results derived depend entirely on the weighting used, and

132   Dr. Abdulle provides no justification for any of the alternative methods he proposes. The

133   weighting methods he proposes have nothing to do with the reliability calculations he

134   advocates (such as hourly Loss of Load Probability) nor with the actual probability of any

135   of the 500 observations (which is 1/500 for each data point). His method simply lacks any

136   support and his results depend entirely on whatever ad-hoc method is adopted, as

137   evidenced by the wide range of results he presents.

138   **Rocky Mountain Power Witness Duvall**

139   **Q.   MR. DUVALL ARGUES THAT YOUR PROPOSED CAPACITY VALUE**
140   **METHOD SHOULD NOT BE ADOPTED BECAUSE IT DEALS WITH EXISTING**
141   **UNITS, NOT THE AVOIDED UNIT. PLEASE COMMENT.**
142
143   A.   I disagree.   First, the purpose of this case is to determine the proper method for

144   determining renewable QF payments based on current conditions. The purpose is not, as

145   Mr. Duvall argues, deciding how to implement the 2005 Order. Mr. Duvall agrees the

146   2005 Order needs to be changed with respect to the Market Proxy method. He also

147   proposes to implement a valuation method (based on the 90% exceedence level) that was

148   not part of the methodology approved in the 2005 Order and also proposes use of a new

149   method for determining wind integration costs. Consequently, his reliance on the order is

150   misplaced.

151   Further, if Mr. Duvall's reasoning were applied to the Company's own thermal

152   units, very few would be considered as firm resources because coal-fired power plants are

153   simply not as reliable as a new combined cycle plant.

154   Finally, reliability impacts the reserve margin requirements which drive the need

155   for new capacity (i.e. the avoided unit.) The reliability based approaches measure the

156   reliability benefits of renewable QFs in a way the Company's simplistic method cannot.

157   **Q.   MR. DUVALL OBJECTS TO APPLYING THE NREL STUDY RESULTS**
158   **QUOTED BY MS. WRIGHT ON THE BASIS THAT THOSE RESULTS WERE**
159   **DETERMINED ON A WECC BASIS AND ARE NOT SPECIFIC TO**
160   **PACIFICORP. DO YOU AGREE?**
161
162   A.   As I pointed out in my rebuttal testimony, the NREL <u>results</u> by themselves are not

163   Company specific, therefore, of limited value for this case. However, that does not mean

164   the underlying <u>methodologies</u> are inappropriate for PacifiCorp. I recommend the

165   Commission require the Company to implement a capacity value based on one of the

166   reliability methods as discussed above.

167   **Q.   DOES THIS CONCLUDE YOUR TESTIMONY?**

168   A.   Yes.