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BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Application of Rocky Mountain Power for Approval of changes to Renewable Avoided Costs Methodology for Qualifying Facilities Projects Larger than Three Megawatts	**DOCKET NO. 12-035-100** **Utah Clean Energy Exhibit 5.0(D)**

REBUTTAL TESTIMONY OF SARAH WRIGHT
ON BEHALF OF
UTAH CLEAN ENERGY

[METHODOLOGY PROCEEDING]

May 15, 2013

RESPECTFULLY SUBMITTED,
Utah Clean Energy

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Sophie Hayes
Attorney for Utah Clean Energy

INTRODUCTION

Q: Please state your name and business address.

A: My name is Sarah Wright. My business address is 1014 2nd Ave, Salt Lake City, Utah 84103.

Q: In this Docket, did you file Direct, Rebuttal, and Surrebuttal Testimony on behalf of Utah Clean Energy regarding the proposed stay of the avoided costs methodology, and Direct Testimony regarding remaining issues?

A: Yes.

Q: What is the purpose of your rebuttal testimony?

A: I will provide responses to the testimony of Division of Public Utilities ("DPU" or "Division") witness Abdinasir Abdulle, Office of Consumer Services ("OCS" or "Office") witnesses Bela Vastag and Randall J. Falkenberg, Renewable Energy Advisors witness Robert Millsap, and Scatec witness Luigi Resta regarding the following issues:

1. Market proxy method
2. Proxy/PDDRR method
   a. Capacity value
   b. Capacity and energy payments
   c. Integration costs
3. Renewable Energy Credits (RECs)
4. Other issues—risk mitigation

Q. Please summarize your rebuttal conclusions.

A. I make the following conclusions and recommendations:

- I maintain that the market proxy method is a valid method and should be utilized when there are renewable resource targets in the Company's Integrated Resource Plan (IRP).

- Upon further research and discussion, I propose the Capacity Factor Allocation Methodology ("CFAM") as a simple alternative to calculating capacity value in the event that the Effective Load Carrying Capability ("ELCC") method recommended in my direct testimony is deemed too onerous.
- Upon review of evidence presented in the direct testimony of Bob Millsap, I now recommend that renewable QFs receive an "un-capped" energy payment stream in addition to capacity payments beginning in the first year.
- I continue to recommend that there be no integration charge for solar Qualifying Facilities ("QFs") because there is no evidence that the negligible amount of solar on the Company's system imposes any integration costs.
- I join the Division and Scatec in their arguments regarding RECs and continue to recommend that renewable QFs be entitled to RECs associated with their energy generation, unless and until the Company reimburses QFs for the renewable energy attributes of that generation.
- I make an additional recommendation for valuing a component of the risk mitigating benefits of renewable QFs.

MARKET PROXY METHOD

Q. What is your rebuttal conclusion regarding the Market Proxy method?

A. I maintain that the market proxy method is a valid method and should be utilized when there are renewable resource targets in the Company's Integrated Resource Plan (IRP).

Q. Whose direct testimony regarding the Market Proxy method will you address?

A. The Division and the Office.

Q. What is the Division's position with regard to the Market Proxy method?

A. The Division made two arguments. First, the Division agreed with the Company that, under current circumstances, the Market Proxy method does not result in accurate avoided cost prices. Second, the Division argued that the Market Proxy method is flawed and should not be reintroduced should circumstances change.

Q. What is your response to the Division?

A. The Division raised concerns that are similar to Dr. Abdulle's arguments in his direct testimony in the avoided cost docket that led to the approval of the Market Proxy method for wind resources up to the IRP target amount (Docket No. 03-035-14). In the 2005 Order approving the Market Proxy method for wind resources up to the IRP target, the Commission noted, "*All parties agree* a Proxy approach for determining the avoided generation capacity and energy costs associated with a wind QF is appropriate for meeting the IRP planned acquisition of cost effective wind resource[s]." Docket No. 03-035-14, *In the Matter of the Application of PacifiCorp for Approval of an IRP-Based Avoided Cost Methodology for QF Projects Larger than One Megawatt,Report and Order* (Issued October 31, 2005), page 18 (emphasis added).

Despite the Division's concerns with it, parties and the Commission concluded that the proxy method "best reflects the avoided cost of a wind QF up to the IRP target level of wind resources." *Id.* at 20-21. The Commission approved the proxy method as "reasonably accurate but also simple and transparent." *Id.* at 20-21.

The Market Proxy method is a sound method, based on least cost, least risk planning. As long as renewables are selected in the IRP, the IRP target should remain the cumulative amount of renewables called for over the planning horizon, regardless of timing. Whether or not renewable resources are added solely for RPS compliance purposes, or whether they are found to be in the public interest for other reasons, should be determined in the IRP docket after a thorough review of costs and risks. As I mentioned in my direct testimony, it may be appropriate to adjust the acknowledgement process, whereby the Commission acknowledges or doesn't acknowledge portions of the IRP or IRP action plan, in order to facilitate use of the Market Proxy method.

Dr. Abdulle raises concerns with the Market Proxy method but does not provide a solution for fairly calculating avoided costs for renewable QFs when there are renewable targets in the IRP. In my direct testimony, I recognizedthat the Market Proxy method may need to be modified to reflect that the Company is no longer issuing regular RFPs and the fact that we currently do not have a market proxy for solar, biomass, or geothermal resources. But it remains Utah Clean Energy's position that the use of a market proxy is still a reasonably accurate, transparent, and fair means to calculate avoided costs for renewables that are present in the IRP.

Q. What other concerns did the Division raise?

A. The Division expressed concern about the static nature of the Market Proxy method. The Division explained,

> Generally, when a QF is introduced into the portfolio mix, it displaces the highest cost resource in the resource stack. The next QF introduced displaces the next highest cost resource because the highest cost resource already has been displaced by the first QF. Each successive QF, in other words, displaces an existing resource of lesser cost than the previous QF.
> Instead of this logical sequential displacement process, the Market Proxy method assumes that the current wind QF displaces the same resource that the previous wind QF has already displaced. In other words, allowing for differences in operating characteristics, the Market Proxy method assumes the avoided costs of the two wind QFs are identical.
>
> DPU Exhibit 2.0 Abdulle, pages 8-9, lines 154-61.

The Market Proxy method was approved as a means of comparing wind resources to wind resources. It is unfair to compare IRP-selected renewable energy to fossil-fueled plants, as the IRP and risk models associated with it are supposed to consider the additional risk mitigating benefits of renewable energy. Furthermore, given that the IRP is updated every two years, IRP renewable energy targetsare refreshed regularly, and updated IRPs will reflect any renewable QFs that have already been added to the system.

Q: Does the excerpt you included from Dr. Abdulle's testimony raise any other issues you would like to address?

A: Yes. Dr. Abdulle's description of how the GRID model displaces the most expensive resources in the resource stack highlights a concern about assumptions used in the GRID model. The Company calculates indicative pricing for each QF that asks for it,assuming that all QFs who have previously asked for indicative pricing (are in the "queue") will be built. As Dr. Abdulle illustrates, each successive QF modeled displaces 'lower cost resources' than the previous QF.

This is concerning because it is not based in reality. Many QFs never get built; therefore, QFs that are farther down in the queue—that do get contracted and built—may be given an artificially lower price if QF projects higher in the queue are not built. If my understanding is correct, this practice is potentially discriminatory to QF projects.

This problem seems easily rectified, however. The Company could update QF pricing at contract signing by placing the contracting QF at its actual position in thequeue, to reflect the project's actual displacement of resources. There may be other ways to rectify this discrimination, but, regardless, it should be a relatively easy fix.

Q. What is the Office's position regarding the Market Proxy method?

A. The Office concluded that the market proxy method is "no longer appropriate" because the Company is not actively seeking wind resources; wind resources in the IRP are for RPS compliance purposes; RPS requirements may be fulfilled through REC purchases rather than actual wind acquisition; and low gas prices coupled with postponed plans to build capacity have depressed avoided cost prices. OCS 1D Falkenberg, pages 4-8. The Office does not address whether the Market Proxy method would again be a suitable method if one or any of the foregoing were to change.

As I argued above and in my direct testimony, the market proxy method should be utilizedwhen there are renewable resource targets in the Company's Integrated Resource Plan. The market proxy prices should be developed using existing Company contracts and publicly available PPAs, and prices should be refreshed annually.

PROXY/PDDRR METHOD

Capacity Value

Q. What is your rebuttal recommendation regarding the capacity contribution of renewable QFs?

A. I recommend the Capacity Factor Allocation Methodology ("CFAM") as a reasonably accurate and simple alternative to calculating capacity valuecompared to the more complicated Effective Load Carrying Capability ("ELCC") method that I recommended in my direct testimony. I will discuss this method more below.

Q. What did the Office propose regarding capacity contribution?

A. The Office evaluated the Company's capacity contribution proposal and concluded that the Company's method treated wind resources "using a different standard" than thermal resources. Therefore, the Office proposed a method aimed at "equalizing the reliability impacts" of thermal and wind resources. OCS 1D Falkenberg, page 13, line 325. Office witness Falkenberg utilized what he called the "Dependence on Supplemental Capacity Resources" method to calculate a capacity contribution for wind resources of 13.8%. Mr. Falkenberg found that wind capacity contributions, at planning reserve margins between 12% and 16%, fell generally within a range of 14%-18%, but decided to select the lowest observed capacity contribution to be conservative, which corresponded to a planning reserve margin of 16%.

Finally, Mr. Falkenberg concluded, "There is no conceptual reason the Company could not perform its own analysis of this nature, using loss of load hours, or whatever reliability metric it prefers. In future updates, the Company should develop an analysis that treats the reliability of thermal and wind resources comparably." OCS 1D Falkenberg, pages 17-18, lines 411-14.

Q. What is your response to the Office's conclusions and recommendations regarding the capacity contribution of renewable resources?

A. I appreciate Mr. Falkenberg's efforts to equalize the evaluation of the reliability benefits of thermal and renewable resources in an attempt to avoid unlawful discrimination against renewable QFs. However, he has not presented a method that calculates the capacity value of renewable resources, but rather he has proposed a method to equalize the treatment of wind and thermal resources in this particular docket. Mr. Falkenberg has not proposed a capacity valuation methodology that applies to renewable resources in general, or that could be utilized in integrated resource planning, but rather he presented "an analysis to determine the wind capacity contribution that would result in equal reliability between wind and Company owned thermal resources." OCS 1D Falkenberg, page 13, lines 328-30.

I recommend that the Commission approve a capacity valuation method that accurately assesses the capacity contribution of variable resources, including solar as well as wind resources. I discussed one such method in my direct testimony and will discuss another method below. Although I do not support using Mr. Falkenberg's method for this docket, if the Commission decides to use it, I recommend using a 13% planning reserve margin to be consistent with the Company's integrated resource planning assumptions.

Q. Has your recommendation for a capacity value calculation method changed since you submitted your direct testimony?

A. I still support the "effective load carrying capability" ("ELCC") method as the most accurate method for valuing the capacity contribution of renewable resources; however, upon further review of various capacity valuation methodologies I have conducted since submitting my direct testimony, I conclude that the "capacity factor approximation method" ("CFAM") is a reasonably accurate alternative approach to capacity valuation. In my direct testimony, I mentioned both reliability-based capacity valuation methods as well as simpler approximation techniques, and attached an NREL paper that outlined a number of each of these methods. The approximation methods tend to be simpler than the reliability-based methods, but also vary widely in accuracy, "especially for variable generation."[1]

One approximation method—the CFAM—comes closest to matching the accuracy of the reliability-based ELCC method I recommended in my direct testimony. NREL found that the CAFM had a root mean square error (RMSE) of 4.12, compared to the other capacity value approximation techniques, which had RMSEs between 11.9 and 44.4.[2] Because the CAFM is simpler than, yet reasonably accurate compared to, the ELCC method, I now propose it as an acceptable alternative to the ELCC method for valuing the capacity contribution of renewable resources in this docket.

Q. Please describe the Capacity Factor Approximation Method.

A. NREL describes the CFAM as follows:

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[1]Seyed Hossein Madaeni, Ramteen Sioshansi, and Paul Denholm, *Comparison of Capacity Value Methods for Photovoltaics in the Western United States* (NREL, July 2012), page 3, available at: http://www.nrel.gov/docs/fy12osti/54704.pdf
[2]*Id.* at 21.

> A common approximation technique considers the capacity factor of a generator over a subset of periods during which the system faces a high risk of an outage event. These techniques have been applied to wind and PV and compared with reliability-based methods to assess their accuracy. Milligan and Parsons introduce three different approximation methods, which differ based on the set of hours examined. One technique uses the average capacity factor during peak hours, whereas another uses the capacity factor during the peak-LOLP [loss of load probability] hours. A third technique uses the highest-load hours but normalizes the capacity factors by the LOLPs. This technique places higher weight on the capacity factor of the wind plant during hours with high LOLPs. Milligan and Parsons have applied these techniques to the top 1% to 30% of hours and have shown that the approximation can approach the ELCC metric *if a suitable number of hours is considered. Their results suggest that using the top 10% of hours is typically sufficient*. In this report we use the third technique.[3]

Given that the CFAM is simpler than the ELCC method and still reasonably accurate, I recommend this method as a reasonable alternative to the ELCC method.

The Company utilized the highest 100 load hours per year for five years in its study; however, to be most accurate, I recommend that the Company perform the CFAM analysis using its top 10% load hours, as recommended in the NREL study.

Q. How does this recommendation relate to the direct testimony of other parties?

A. The Division did not oppose the Company's method and did not propose a specific capacity value calculation method but recommended that the capacity contribution for QFs should be updated at least annually. Scatec concluded that the Company's capacity valuation method likely underestimated capacity contribution. Given that the CFAM is similar to the Company's method—in that it is based on capacity factor during high load hours—but more comparable to the more accurate reliability-based

[3]Seyed Hossein Madaeni, Ramteen Sioshansi, and Paul Denholm, *Comparison of Capacity Value Methods for Photovoltaics in the Western United States* (NREL, July 2012), page 6, available at: http://www.nrel.gov/docs/fy12osti/54704.pdf (footnotes omitted) (emphasis added).

ELCC method, I assume that my rebuttal recommendation does not directly contradict either of these party's positions.

Q. Have you completed this approximation method for the high load hours presented by the Company in this docket?

A. No. I have requested the loss of load probability information requisite for doing the analysis for the Company's 500 highest load hours from 2007 to 2011. Additionally, the Division submitted a data request to the Company asking for capacity contributions, for the same 500 highest load hours from 2007 to 2011, of both wind and solar, according to the Effective Load Carrying Capability method and the capacity factor approximation method. The Company responded that it "has not performed the requested studies." Rocky Mountain Power's Response to DPU Set 5 (1) in UT Docket 12-035-100.

Energy and Capacity Payment Streams

Q. What is your rebuttal position regarding the capacity and energy payment streams for renewable QFs?

A. As discussed in my direct testimony, I recommend that renewable avoided cost pricing for renewable QFs include a capacity contribution beginning in the first year. Upon review of evidence presented in direct testimony, I now also recommend that renewable QFs receive an "un-capped" energy payment stream.

Q. In his direct testimony on behalf of Renewable Energy Advisors, Mr. Millsap shows that, once the deferrable resource is added, GRID caps the energy payment stream. Millsap direct testimony, lines 31-43. Is this cap an accurate reflection of avoided energy costs?

A. No. Mr. Millsap’s testimony highlights important components of the Proxy/PDDRR method that undervalue the energy value of QFs. The Proxy/PDDRR method compares two GRID runs—one without a QF and one with a QF—in order to determine avoided energy costs. In the second GRID run, with the QF, the QF displaces a fixed portion of the energy produced by the “deferrable resource,” proportionate to the QF’s capacity value. In other words, in the second GRID run,the deferrable resource is made smaller by the partial displacement from the QF.

In the second GRID run, the QF displaces its assigned portion of the deferrable resource at the dispatch cost of the deferrable resource at PacifiCorp's assumed fuel price. The energy cost that comes out of this GRID run is composed partially of the avoided energy costs from that partially displaced resource and partially from the avoided dispatch of other resources or market purchases, as determined in GRID. This second run, compared with the first GRID run (without the QF), creates an avoided energy cost.

Q. Is this the energy cost that results in the energy payment stream to QF resources?

A. Not completely. The energy cost from the second GRID run is the energy cost that is used until the assumed addition of the deferrable resource. Once the deferrable resource is presumed to come online, the Company adjusts the energy payment, outside of the GRID model, by capping the entire energy payment by the dispatch cost of the next deferrable resource at PacifiCorp's assumed fuel price. In other words, the QF energy payment stream is adjusted twice. In addition to reducing the energy payment stream in the second GRID run by assuming that the QF will displace a portion of the deferrable resource, the energy payment is reduced again when the deferrable resource is added, regardless of resources actually displaced in the GRID model by the addition of the QF.

Q. Is this a reasonable adjustment?

A. No. It is inaccurate to place an additional cap on an energy price that has already been adjusted based on the displacement of a portion of the next deferrable resource. Given that GRID already takes the energy cost impacts of partially displacing the deferrable resource into account in its output, it is unreasonable to further reduce energy payments to QFs based on the assumption that, once the deferrable resource comes online, the QF will only displace that resource.

This problem is exacerbated because PacifiCorp's 'preferred portfolio' in its IRP relies heavily on front office transactions through the 2032 planning horizon, even after the next IRP capacity resource is added. In fact, according to the 2013 IRP, projected third-quarter front office transactions*increase* by 60 MW in 2025 to 1072 MW, after the Company adds a CCCT, compared to 2024. PacifiCorp 2013 IRP, Volume 1, page 227. See Exhibit UCE 5.1(R).

If a QF provides energy during periods when the Company is purchasing Front Office Transactions, it is probable that the QF will be avoiding these purchases, rather than generation from a Company-owned gas plant. Under the current scenario, where the Company is relying heavily on market purchases even after the 2024 resource is added, QFs will likely still displace market purchases. Therefore, it is not reflective of avoided costs to cap the entire energy payment based on the dispatch cost of the deferrable resource.

Q. What energy payment approach for renewable QFs would maintain ratepayer neutrality and provide a fairer energy payment to the QF?

A. Because the Proxy/PDDRR method is tied to the next deferrable resource, regardless of what the QF displaces, it does not accurately represent the energy costs avoided by QFs. UCE is not proposing to move away from the Proxy/PDDRR method in this docket; however, we believe that the energy price component should be determined by the GRID model and not capped artificially.

Renewable QFs should receive an "un-capped" energy payment stream based on the GRID model's evaluation of the cost of displaced energy over the contract period. If the GRID runs show that the QF is displacing higher cost resources, the QF should be compensated accordingly. This would be a fairer method to pay the renewable QF for the value of its energy while maintaining ratepayer neutrality.

Q. How does this relate to your direct testimony regarding the payment stream for capacity from renewable QFs?

A. The Company is heavily reliant on the market for its resource needs over the planning horizon, both during its periods of resource "sufficiency" and "deficiency." In effect, the Company is in a constant period of resource deficiency; therefore, QFs should be paid for their capacity contribution starting in the first year. Furthermore, renewable QFs' capacity value contributes to meeting the Company's planning reserve margin in each year of the QF contract—reducing the costs and resources otherwise needed to meet the planning reserve margin from the first year of operation. Therefore, I recommend that renewable avoided cost pricing for renewable QFs include a capacity contribution beginning in the first year.

Integration Costs

Q. What is your rebuttal recommendation regarding integration costs?

A. I continue to recommend that there be no integration charge for solar Qualifying Facilities ("QFs") because there is no evidence that the negligible amount of solar on the Company's system imposes any integration costs. DPU Witness Abdulle's recommendation for a pro-rated integration charge is fairer than assigning a full wind integration charge to solar, but is not supported by evidence that the Company actually incurs any solar integration costs.A solar integration study, as recommended by OCS Witness Falkenberg, could provide information upon which to evaluate whether solar generation incurs integration costs for the Company. However, until there is evidence that the Company incurs integration costs for solar, solar QFs should not be charged an integration cost. Charging solar QFs for costs the Company does not incur does not conform to the principle of ratepayer indifference.

Q. What parties addressed the Company's integration costs proposal?

A. The Division, the Office, and Scatec. There appears to be consensus that utilizing wind integration costs for solar is improper, but parties' recommendations varied. The Division used "Company provided data" to show that solar facilities are less variable than wind on a relative basis and recommended that peak-oriented solar be charged 50% of the wind integration cost and that energy-oriented solar be charged 65% of the wind integration cost. DPU Exhibit 2.0 Abdulle, pages 13-15, lines 253-69. The Office highlighted the lack of evidence determinative of solar integration costs or justifying use of the wind integration cost for solar integration. The Office deferred taking a position on this issue but recommended that the Company be directed to complete a solar integration study. OCS 1D Falkenberg, page 11, lines 267-85. Scatec testified that solar is less costly to integrate than wind. Scatec Direct Testimony, page 10, lines 17-18.

Q. What is your response to the Division's analysis and recommendation?

A. The Division's analysis is compelling in its portrayal of the predictability of the sun's daily rise and fall and we appreciate their effort to look at the variability of solar to adjust the integration charges. But their analysis does not replace a solar integration study and it disregards an important fact about PacifiCorp's system: that, according to its IRP, the Company currently has *no* utility-scale solar on its system.[4] PacifiCorp 2013 IRP, Volume 1, page 84. The Company's solar data presented in this docket was based on *PV Watts* modeling. The assumption that the Company incurs *any* costs for solar integration is unsupported in the record before the Commission. Until the Company performs a solar integration study, utilizing a technical review committee, to quantify actual solar integration costs, solar QFs should not be charged an integration cost.

Q. What is your response to the Office's recommendation that the Company perform a solar integration study?

A. We are supportive ofa solar integration study, as recommended by OCS Witness Falkenberg. It will provide information upon which to evaluate whether solar generation incurs integration costs for the Company. The study should utilize a Technical Review Committee. Until there is information about the actual costs the Company incurs to

[4] 2013 IRP, page 84. On the other hand, PacifiCorp either owns or contracts for 2,186 MW of wind (1,032 of owned resources, 1,154 MW of purchased or exchanged wind). *Id.* at 83-84.

integrate solar energy, it is unreasonable to allocate integration costs to solar QFs. Charging solar QFs for costs the Company does not incur does not conform to the principle of ratepayer indifference.

RENEWABLE ENERGY CREDITS

Q. Do you have any clarifications to provide regarding your direct testimony on the issue of renewable energy credits ("RECs")?

A. Yes. In my direct testimony, I explained that under the Market Proxy method RECs are transferred to the utility. I want to clarify that RECs are transferred to the utility under the Market Proxy method *if* the Company contracted to own the RECs in the most recently executed market-based wind contract.

Q. What parties addressed REC ownership related to renewable QF contracts?

A. The Division, Scatec, and the Office. The Division concluded that RECs should remain with the QF unless the purchase price compensates the QF for environmental attributes. Scatec concluded that RECs remain with the QF unless parties to the power purchase contract agree otherwise. The Office argued that QF power purchase agreements require that RECs be bundled with QF electricity generation.

Q. What is your response to the Division's position?

A. I support the Division's position with regard to REC ownership. The Division explained that PURPA contemplates the purchase of *generic power* and therefore RECs are not part of what the Company buys with an avoided cost payment. DPU Exhibit 2.0 Abdulle, page 16, lines 288-305. With regard to the this docket, the avoided cost methodology proposed by the Company specifically does not compensate QFs for RECs because it is designed narrowly to compensate only for energy and capacity, without consideration of environmental attributes that generate RECs.

Furthermore, I agree with the Division that the Company's REC proposal discriminates against renewable QFs compared to cogeneration QFs: the cost of generic energy and capacity from renewable QFs would be reduced by the value of the RECs conveyed to the utility for free. DPU Exhibit 2.0 Abdulle, page 17, lines 309-26. The Division cited PURPA and Commission orders supportive of its position and concluded that RECs should remain with the developer unless the Company pays for them. DPU Exhibit 2.0 Abdulle, page 18, lines329-45. I support the Division's arguments, and it is Utah Clean Energy's position that Commission and FERC precedent, as well as PURPA itself, support the Division's position.

Q. What is your response to Scatec's position?

A. Scatec showed that the Company's position directly conflicts with FERC precedent. Scatec direct testimony, pages 4-8. Scatec's position is consistent with my understanding of PURPA, Commission and FERC precedent, the Division's position, and my direct testimony.

Q. What is your response to the Office's position?

A. The Office's position regarding REC ownership mirrors the Company's and is therefore unsupportable for the same reasons as described above and in the direct testimony of the Division, Scatec, and Utah Clean Energy. Common fairness requires that the QF retain RECs unless the Company pays for renewable energy credits through its avoided cost pricing. It is the only way to maintain ratepayer indifference and not discriminate between resources.

Q. What is your conclusion regarding REC ownership?

A. The Office, in mirroring the Company's position, has not offered any compelling evidence that transferring REC ownership to the utility would not result in unlawful discrimination between QF resource types, would not violate ratepayer indifference, and would not directly contradict FERC and Commission precedent. Therefore, I join the Division and Scatec in their arguments regarding RECs and continue to recommend that renewable QFs be entitled to RECs associated with their energy generation, unless and until the Company reimburses QFs for the renewable energy credits associated with that generation.

OTHER ISSUES—RISK MITIGATION

Q. Did any other party besides Utah Clean Energy raise the issue of renewables' ability to provide a long-term hedge against fuel price volatility and environmental regulation?

A. Yes, Scatec argued that avoided costs should account for the role large-scale solar plays in hedging against environmental regulatory and fuel price uncertainty. Scatec direct testimony, pages 12-13. Renewable Energy Advisors ("REA") noted the Company's exclusion of potential carbon prices in avoided cost pricing. REA direct testimony, page 2, lines 21-28.

Q. Do you have a response to the issue of renewable risk mitigation?

A. Yes. As I stated in my direct testimony, renewable energy avoids a number costs that ratepayers would bear in the absence of the QF. The cost of inevitable carbon regulation is one such avoidable cost. Regarding the inevitability of carbon regulation, it is of note that the concentration of CO_2, as measured at the Mauna Loa observatory in the Pacific, recently reached a daily average of 400 (399.89) parts per million for what scientist report is the first time in over 800,000 years.[5] For the majority of the 8,000 years of human civilization, and before the industrial revolution, the atmospheric CO_2 concentrations was near 280 parts per million. It is inevitable that we will need to take action, carbon will be regulated, and there will be a cost for carbon emissions.

Avoidable costs of carbon regulation can be estimated and should be included in avoided cost pricing for renewable resources. Utah Clean Energy's consultant, Energy Strategies, calculated avoidable carbon cost estimates based on PacifiCorp's conservative 2013 IRP carbon price scenarios. The IRP base case "medium CO_2 price scenario" doesn't include a carbon cost until 2022 and starts at a cost of $16 per short ton of CO_2. In the "high CO_2 price scenario" the price on carbon begins in 2020, ramping into more stringent requirements over the first two years. The hard cap price scenarios assign carbon prices based on cap and trade mechanisms beginning in 2020 under different gas price scenarios. PacifiCorp's carbon price scenarios are described in the 2013 integrated resource plan at pages 167 through 170.

Evaluation of the range of PacifiCorp's carbon price assumptions demonstrates significant avoidable carbon regulation costs. Using a very conservative assumption of a 20% capacity factor for utility solar, an 80 MW solar plant located in Salt Lake City (again a conservative assumption because large solar facilities will likely be built in southern Utah, which offers a better solar resource) will generate 145.5 GWh each year and avoid a mix of system generation and market purchases.

[5]http://researchmatters.noaa.gov/news/Pages/CarbonDioxideatMaunaLoareaches400ppm.aspx.

Energy Strategies calculated the avoided carbon costs per MWh and levelized the costs over a 20 year period. To be conservative, we assumed that all avoided generation is natural gas generation, which has much lower CO2 emissions than coal generation. Table 1 below shows the levelized cost per ton of CO2 avoided for each of PacifiCorp's Integrated Resource Plan carbon price scenarios and Table 2 shows the levelized value of avoided CO2 emissions per MWh of solar generation. The levelized value of avoided emissions, assuming displacement of natural gas generation, is $3.44/MWh for the 'base' case, $9.31/MWh for the 'high' case, $15.37/MWh for a hard cap, low gas price scenario, and $18.50/MWh for a hard cap, high gas price scenario. QF renewable resources should be compensated for these avoidable costs.

Table 1. 20 year Levelized Cost of CO2 from IRP Scenarios
$/Short Ton

Discount Rate 7.154%

year	None	Base	High	Hard Cap, Base Gas	Hard Cap, High Gas
2013	$0.00	$0.00	$0.00	$0.00	$0.00
2014	$0.00	$0.00	$0.00	$0.00	$0.00
2015	$0.00	$0.00	$0.00	$0.00	$0.00
2016	$0.00	$0.00	$0.00	$0.00	$0.00
2017	$0.00	$0.00	$0.00	$0.00	$0.00
2018	$0.00	$0.00	$0.00	$0.00	$0.00
2019	$0.00	$0.00	$0.00	$0.00	$0.00
2020	$0.00	$0.00	$13.53	$47.47	$57.08
2021	$0.00	$0.00	$19.68	$50.86	$61.17
2022	$0.00	$16.00	$26.05	$54.49	$65.53
2023	$0.00	$16.78	$32.67	$58.38	$70.21
2024	$0.00	$17.61	$39.52	$62.55	$75.22
2025	$0.00	$18.47	$46.62	$67.01	$80.59
2026	$0.00	$19.37	$49.88	$71.80	$86.34
2027	$0.00	$20.32	$53.37	$76.94	$92.52
2028	$0.00	$21.32	$57.11	$82.44	$99.14
2029	$0.00	$22.36	$61.10	$88.35	$106.24
2030	$0.00	$23.46	$65.38	$94.67	$113.84
2031	$0.00	$24.63	$70.02	$101.55	$122.12
2032	$0.00	$25.86	$74.99	$108.88	$132.25
20 year Levelized Cost	**$0.00**	**$7.59**	**$30.50**	**$48.27**	**$58.11**

Table 2. Carbon Value in $ per MWH Based on Avoided Natural Gas Generation

Discount Rate 7.154%

	BASE	HIGH	Hard Cap, Base Gas	Hard Cap, High Gas
	($/MWh)	($/MWh)	($/MWh)	($/MWh)
2013	$0.00	$0.00	$0.00	$0.00
2014	$0.00	$0.00	$0.00	$0.00
2015	$0.00	$0.00	$0.00	$0.00
2016	$0.00	$0.00	$0.00	$0.00
2017	$0.00	$0.00	$0.00	$0.00
2018	$0.00	$0.00	$0.00	$0.00
2019	$0.00	$0.00	$0.00	$0.00
2020	$0.00	$6.13	$21.52	$25.87
2021	$0.00	$8.92	$23.05	$27.73
2022	$7.25	$11.81	$24.70	$29.70
2023	$7.61	$14.81	$26.46	$31.82
2024	$7.98	$17.91	$28.35	$34.10
2025	$8.37	$21.13	$30.37	$36.53
2026	$8.78	$22.61	$32.55	$39.14
2027	$9.21	$24.19	$34.88	$41.94
2028	$9.66	$25.89	$37.37	$44.94
2029	$10.14	$27.70	$40.05	$48.16
2030	$10.63	$29.64	$42.91	$51.60
2031	$11.16	$31.74	$46.03	$55.35
2032	$11.72	$33.99	$49.35	$59.95
Levelized value of avoided CO2 per MWH	**$3.44**	**$9.31**	**$15.37**	**$18.50**

Q. What is your recommendation regarding compensation for avoided carbon regulation costs?

A. Utah Clean Energy recommends that renewable QFs receive payment for carbon regulation costs they avoid at a levelized cost per MWh. The Company's "high" scenario is, in my opinion, a more likely potential cost than the "base" scenario, so I recommend using the "high" scenario cost as a reasonable approximation of avoided carbon regulation costs. This estimate should be updated with the Company's IRP.

CONCLUSION

Q. Do you have any other conclusions or recommendations to make in your rebuttal testimony?

A. I want to make some concluding remarks on ratepayer neutrality, which is an important concept in avoided cost pricing that parties raised in direct testimony. I do not believe the current Proxy/PDDRR method maintains ratepayer neutrality. Renewable QF projects are not paid the full value of the energy and capacity that they bring to the system under the current method.Further, the current method does not compensate renewable QFs for avoidable fuel hedge costs and future regulatory costs that ratepayers will be responsible for paying. If indeed ratepayers were insulated from costs that exceed the forward price curve for fuel and energy and they were protected from the regulatory risks created by PacifiCorp's resource decisions, the Proxy/PDDRR method would come closer to achieving ratepayer neutrality. But alas, customers are at risk for fuel price increases through the energy cost adjustment mechanism (ECAM) and in rate cases, and customers will also bear the costs of carbon regulation.In order to achieve real ratepayer indifference, renewable qualifying facilities must be compensated for the actual costs they allow the utility and ratepayers to avoid.

Q. Does that conclude your testimony?

A. Yes, it does.