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BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Application of Rocky Mountain Power to Establish Export Credits for Customer Generated Electricity	**Docket No. 17-035-61 Phase 2**

SURREBUTTAL TESTIMONY OF SACHU CONSTANTINE

ON BEHALF OF

VOTE SOLAR

September 15, 2020

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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Sachu Constantine. My business address is 360 22nd Street, Suite 730, Oakland, California 94612.

Q. On whose behalf are you submitting this surrebuttal testimony?

A. I am submitting this surrebuttal testimony on behalf of Vote Solar.

Q. Please provide an overview of your educational and professional experience.

A. A detailed overview of my educational and professional experience can be found in my Revised Affirmative Testimony filed May 8, 2020.[1]

Q. By whom are you employed and in what capacity?

A. I serve as Managing Director, Regulatory for Vote Solar. I manage the full regulatory team for Vote Solar and analyze the development and implementation of policy initiatives related to distributed solar generation. My team is responsible for evaluating utility cost-of-service studies, revenue allocation and ratemaking, resource planning, and grid modernization proceedings as well as Load Research Studies ("LRS") and other quantitative analyses.

Q. Have you previously testified before the Utah Public Service Commission ("PSC" or "Commission")?

A. Yes. I submitted Revised Affirmative Testimony dated May 8, 2020, and Rebuttal Testimony dated July 15, 2020, both in Phase 2 of this proceeding.

Q. Have you previously testified before other regulatory commissions?

[1] Vote Solar, *Revised Affirmative Testimony of Sachu Constantine*, May 8, 2020 ("*Constantine Revised Affirmative*"), lines 21-36.

A. No.

II. PURPOSE OF TESTIMONY

Q. What is the purpose of your surrebuttal testimony in this proceeding?

A. My surrebuttal addresses critiques of Vote Solar's affirmative positions in the rebuttal testimony filed by witnesses from Rocky Mountain Power/PacifiCorp ("RMP")[2], the Utah Division of Public Utilities ("DPU")[3], and the Office of Consumer Services ("OCS").[4]

The absence of comments from me on any component of other parties' direct, affirmative, or rebuttal testimony should not be interpreted as acquiescence or agreement. In addition, I reserve the right to express additional opinions, to amend or supplement the opinions in this testimony, or to provide additional rationale for these opinions as additional documents are produced, and new facts are introduced during discovery and hearing. I also reserve the right to express additional opinions in response to any opinions or testimony offered by other parties to this proceeding.

III. SUMMARY OF OPINIONS

Q. Please summarize any changes to your opinions based on the rebuttal testimony presented by RMP, DPU and OCS witnesses.

A. The opinions expressed in my Affirmative and Rebuttal Testimonies remain unchanged. In assessing the costs and benefits of CG exports, the Commission should

[2] RMP, *Rebuttal Testimony of Joelle R. Steward*, July 15, 2020 ("*Steward Rebuttal*"); RMP, *Rebuttal Testimony of Daniel J. MacNeil*, July 15, 2020 ("*MacNeil Rebuttal*"); RMP, *Rebuttal Testimony of Jacob S. Barker*, July 15, 2020 ("*Barker Rebuttal*"); RMP, *Rebuttal Testimony of Robert M. Meredith*, July 15, 2020 ("*Meredith Rebuttal*").
[3] DPU, *Rebuttal Testimony of Robert A. Davis*, July 15, 2020 ("*Davis Rebuttal*"); DPU, *Rebuttal Testimony of* Abdinasir M. Abdulle, July 15, 2020 ("*Abdulle Rebuttal*").
[4] OCS, *Rebuttal Testimony of Michelle Beck*, July 15, 2020 ("*Beck Rebuttal*"); OCS, *Rebuttal Testimony of Philip Hayet*, July 15, 2020 ("*Hayet Rebuttal*").

include a full accounting of the benefits of CG solar, including avoided generation and capacity costs, avoided transmission and distribution costs, and avoided carbon compliance costs, and should value the quantifiable benefits of environmental and health improvements for the citizens of Utah. Vote Solar and its experts have put substantial evidence in the record quantifying each of these benefits. That evidence shows the benefits of CG solar exports substantially exceed costs, even if the value of environmental and health benefits are ignored and, therefore, justifies the restoration of the net metering program.[5]

Accordingly, Vote Solar continues to assert that the findings in this proceeding justify a return to the Schedule 135 NEM program as the "appropriate compensation method for CG exports."[6] This is a fair and reasonable outcome that compensates customer generators for the substantial value their exports provide to RMP and ratepayers in Utah. Vote Solar's proposal is supported by the evidence, easy to administer, and, as discussed below, consonant with the terms of the settlement stipulation between RMP and other intervenors entered during the previous docket ("Settlement Stipulation").[7] Alternatively, the Commission should adopt an ECR of 24.17 cents per kilowatt hour.[8] Under either outcome, setting a fair rate for CG exports will encourage the growth of

[5] Vote Solar, *Rebuttal Testimony of Carolyn A. Berry*, July 15, 2020 ("*Berry Rebuttal*"), lines 41-113; Vote Solar, *Rebuttal Testimony of Sachu Constantine*, July 15, 2020 ("*Constantine Rebuttal*"), lines 149-54.
[6] *Constantine Revised Affirmative*, lines 162-63.
[7] Rocky Mountain Power, *Settlement Stipulation*, Public Service Commission of Utah, Docket No. 14-035-114, Aug. 28, 2017, https://pscdocs.utah.gov/electric/14docs/14035114/296270RMPSettleStip8-28-2017.pdf.
[8] Vote Solar originally proposed an ECR of 22.22 cents per kilowatt hour based, in part, on an avoided generation capacity value of 1.48 cents per kilowatt hour. Dr. Milligan has corrected the value of avoided generation capacity from 1.48 cents to 3.43 cents per kilowatt hour to reflect the cost of a combustion turbine (as he intended) rather than the cost of a duct-firing resource. *See* Vote Solar, *Surrebuttal Testimony of Michael Milligan*, Sept. 15, 2020 ("*Milligan Surrebuttal*"), lines 634-636. Vote Solar has accordingly revised its proposed ECR from 22.22 cents to 24.17 cents per kilowatt hour to reflect this correction.

this valuable technology, which provides substantial benefits to all ratepayers, as outlined in the testimony of Vote Solar's experts.[9]

RMP's proposal is both fundamentally flawed and unsupported by the evidence. RMP's proposed ECR of 1.526 cents per kilowatt hour on average is split into seasonally adjusted, time-varying peak and off-peak rates ranging from 1.325 cents per kilowatt hour for winter off-peak to 2.629 cents per kilowatt hour for summer peak. These rates are so low that they are likely to eliminate incentives for citizens to adopt CG solar in RMP's Utah service territory.[10] RMP arrives at this exceedingly low rate by heavily or entirely discounting every quantifiable benefit that CG solar provides. For instance, RMP calculates avoided energy costs based on an outdated model and obviously wrong backward-looking prices, ignoring PacifiCorp's (RMP's parent company) own forward-looking price projections and its Official Forward Price Curve ("OFPC"). RMP attributes zero value to avoided capacity cost based on the meaningless characterization of CG exports as a "non-firm resource" despite the highly salient facts that CG exports are a dependable and quantifiable resource generated by customers who have made a substantial long-term investment in solar generation and who have no possible alternative buyer other than RMP. Among other things, RMP's argument ignores the contribution that "as-available" resources like CG solar make to capacity contributions.[11] RMP also argues that no credit should be given for avoided

[9] *See, e.g.*, Vote Solar, *Revised Affirmative Testimony of Carolyn A. Berry*, May 8, 2020 ("*Berry Revised Affirmative*"), lines 168-92. Parallel analyses from Utah Clean Energy and Vivint Solar likewise show that the benefits of solar significantly exceed retail rates. *See generally* Utah Clean Energy, *Rebuttal Testimony of Kate Bowman*, July 15, 2020; Vivint Solar, *Rebuttal Testimony of Christopher Worley*, July 15, 2020.

[10] *Meredith Rebuttal*, lines 100-02; RMP, *Direct Testimony of Daniel J. MacNeil*, Feb. 3, 2020 ("*MacNeil Direct*"), Exhibit RMP_DJM-1 ("Export Credit Summary by Element").

[11] *See* Vote Solar, *Rebuttal Testimony of Michael Milligan*, July 15, 2020 ("*Milligan Rebuttal*"), lines 575-88.

transmission and distribution costs ("T&D costs") because they are purportedly too difficult to quantify, even as RMP itself calculates avoided T&D costs for its own energy efficiency programs. RMP further assigns no value to avoided carbon costs merely on the ground that RMP is not presently required to pay them, yet RMP quantifies carbon costs for its own operations and planning purposes. RMP similarly ignores the panoply of health, environmental, and economic benefits that CG exports provide, even as the harm caused by climate change becomes more severe, imminent, and irreversible with each passing year. RMP effectively seeks a subsidy for its corporate shareholders (by underpaying for CG exports) so it can send jobs and economic growth outside of the state, while limiting the growth of in-state jobs and economic activity for citizens of Utah.

RMP not only proposes an unjustifiably low ECR value, but also seeks to institute a number of program features that (i) violate principles of good rate design, (ii) make billing more complex and less easy to understand for customers, (iii) incentivize consumption during times when the grid would most benefit from CG exports, (iv) discriminate against customer generators, and (v) make the adoption of customer generation economically unfeasible. Indeed, RMP's rate design is so counterintuitive, given the longstanding policy objective to incentivize conservation, especially during peak hours, that it is hard to avoid the conclusion that RMP's goal is not fairness, but rather elimination of CG solar generation. For example, RMP proposes $310 in new application and metering fees just to become a CG exporter. These fees are discriminatory in that they are not levied against any other customer class, and, as Dr. Lee stated in his rebuttal testimony average customer generators would not earn even

the $310 in export credits until they have exported solar energy for almost three years under RMP's proposed rates. Even if all such exports were during "peak" hours, it would take the average customer two years to export enough energy to offset these fees.[12] RMP's artificially low ECR and its proposed fees alone will discourage and likely eliminate new CG installment in Utah. Further demonstrating the dampening effect RMP's proposed ECR would have on the adoption of CG solar, average customers would not earn sufficient expert credits to offset a CG investment for 142 years under RMP's proposed structure.[13]

Several parties in this proceeding have opined that the Commission should avoid setting an ECR that acts as a "subsidy" or that shifts costs from one group of ratepayers to another. Vote Solar agrees. In the prior docket, RMP, OCS, and DPU argued vociferously against net metering on the basis of the then-unproven assertion that other ratepayers subsidized CG solar customers.[14] Despite clear proof to the contrary, they continue to do so here, this time by merely turning a blind eye to the proof that the benefits of CG solar outweigh the costs. Indeed, the evidence now conclusively shows that both RMP and non-customer generators receive substantial benefits from customer generators, benefits for which customer generators are not compensated—not the other way around. OCS speculated in Phase 1 of this proceeding that that the costs of net metering outweighed its benefits,[15] and therefore customer generators were being

[12] Vote Solar, *Surrebuttal Testimony of Albert J. Lee*, Sept. 15, 2020 ("*Lee Surrebuttal*"), lines 63-65.
[13] Vote Solar, *Rebuttal Testimony of Albert J. Lee*, July 15, 2020, lines 298-300, 331-34; *Lee Surrebuttal*, lines 70-71.
[14] *See, e.g.*, RMP, *Rebuttal Testimony of Joelle R. Steward*, July 2017, lines 127-29; DPU, *Rebuttal Testimony of Artie Powell*, July 25, 2017, lines 86-87; OCS, *Direct Testimony of James W. Daniel*, June 8, 2017, lines 155-58.
[15] *See generally* OCS, *Direct Testimony of James W. Daniel*, June 8, 2017.

subsidized by other ratepayers. Now that Vote Solar has proven the opposite to be true, OCS continues without any evidentiary basis to repeat its argument that customer generators receive a subsidy, demonstrating an unbending loyalty to RMP and its shareholders rather than the consumers it is supposed to serve and protect. Finally, any consideration of demand-side cost shifting must also consider the benefits from demand-side shift, which is not strictly before this Commission. Vote Solar believes in both customer choice and a modern, clean, affordable electricity grid. Neither of these require a subsidy, but they do require fair compensation for CG exports.

IV. REINSTATING THE NEM PROGRAM

Q. Is the Commission obligated to make a final ruling on the benefits and costs of NEM?

A. Yes. The PSC has never made a final ruling on the benefits and costs of NEM, as required by Utah Senate Bill 208 in 2014.[16] Utah Code Section 54-15-105.1 requires this Commission to:

> (1) determine, after appropriate notice and opportunity for public comment, whether costs that the electrical corporation or other customers will incur from a net metering program will exceed the benefits of the net metering program, or whether the benefits of the net metering program will exceed the costs; and (2) determine a just and reasonable charge, credit, or ratemaking structure, including new or existing tariffs, in light of the costs and benefits.

The Settlement Stipulation provided that the Schedule 136 Transition Program would apply until such time as the appropriate compensation method for CG exports was

[16] 2014 Utah Laws Ch. 53 (S.B. 208); *see also* Utah Code Ann. § 54-15-105.1.

determined in this proceeding.[17] Indeed, in its order approving the prior docket settlement, the Commission acknowledged that "the Settlement does not operate to annul our obligations under Subsection One, rather it prolongs them. Given the additional load studies and other data that will be collected in the meantime, we anticipate being even better equipped to make the required findings at that future date."[18] Instead of foreclosing the possibility of a future NEM Program, the Settlement Stipulation created a transition program as a placeholder to allow for further analysis to determine the proper method of compensating CG exports.

Ms. Steward is wrong when she asserts that Vote Solar is trying to "undo" the Settlement Stipulation by advocating a return to net metering.[19] Ms. Steward reads into the Settlement Stipulation a term that does not exist—namely, a prohibition on restoring the NEM program in the event that the benefits of NEM outweigh the costs. Likewise, Ms. Steward[20] and Mr. Hayet[21] are wrong when they assert that Vote Solar contests the enforceability of the Settlement Stipulation. To the contrary, Vote Solar seeks to apply the plain language of the Settlement Stipulation, which expressly contemplates that this proceeding will help the Commission decide whether a return to net metering is warranted as part of a determination of the proper credit for CG exports. And because Vote Solar has carried its burden to show that the benefits of a net

[17] Rocky Mountain Power, *Settlement Stipulation*, Utah Public Service Commission, Docket No. 14-035-114, ¶ 15, Aug. 28, 2017, https://pscdocs.utah.gov/electric/14docs/14035114/296270RMPSettleStip8-28-2017.pdf.
[18] *Order Approving Settlement Stipulation*, Public Service Commission of Utah, Docket No. 14-035-114, Sept. 29, 2017, p. 9, https://pscdocs.utah.gov/electric/14docs/14035114/297036140351140ass9-29-2017.pdf.
[19] *Steward Rebuttal*, line 195 ("Undoing a settlement three years after the ink is dry would set a precedent that would permanently undermine future settlement efforts . . . ."); *see also Hayet Rebuttal*, lines 86-90.
[20] *Steward Rebuttal*, lines 195-99.
[21] *Hayet Rebuttal*, lines 90-92.

metering program exceed its costs, and because neither RMP nor any other party has sustained its burden of proving a fair export credit rate derived using a scientifically valid methodology, the Commission should restore the NEM program rather than adopt a separate ECR that is more difficult to understand and administer.

Net metering's ease of implementation, its simplicity and transparency, and the ECR alignment with retail consumption rates all weigh in favor of adopting that approach. NEM is clearly an "appropriate compensation method for CG exports," as is sought in the proceeding here.

Q. Do you agree with Mr. Hayet that Vote Solar does not consider all of the costs of the NEM program?

A. No. Vote Solar's calculations are based on a meticulous investigation and demonstrate the substantial benefits that CG exports provide. Mr. Hayet identifies two particular costs that he asserts Vote Solar has not considered: "unjust" retail rate compensation and "shifted costs" to non-participating customers.[22] The first is addressed by Vote Solar's avoided cost analysis, which shows that the value of CG exports meets or exceeds average retail rates by as much as 600%,[23] and by the fact that RMP has entirely failed to consider the benefits from a demand-side shift in consumption.

Mr. Hayet's second assertion is also without basis. Vote Solar's analysis shows that, even under net metering, it is customer generators who produce at least 24.17 cents of benefits per exported kilowatt hour (without including substantial benefits from behind-the-meter usage) and thereby subsidize RMP and other ratepayers. Vote Solar's

[22] *Hayet Rebuttal*, lines 102-05.
[23] *Constantine Revised Affirmative*, line 322 (Table 2).

analysis illustrates that CG customers are more likely to contribute to a net *decrease* in the cost of operating the grid, which translates to lower costs for everyone. This is further supported by analysis from Rocky Mountain Institute, which found that "distributed solar-plus-storage systems, where allowed to compete in all-source procurements or wholesale energy markets, can bid in at lower net costs to the utility or market due to the customer-facing value they provide."[24]

Q. Is there any evidence in the record that reflects an administrative or operational cost to the NEM program?

A. No. There is no evidence in the record to suggest that the administrative cost of a NEM program would be materially different from that of an ECR program. The Commission should assume that if RMP had any such evidence, it would have offered it.

V. VOTE SOLAR'S ECR VALUE CALCULATION

Q. Does Vote Solar's proposed ECR result in a "subsidy" to customer generators from other RMP ratepayers?

A. No. As I mention above, several witnesses misconstrue Vote Solar's proposed ECR as a form of subsidy to customer generators and mischaracterize CG exports as a burden that RMP and non-participating customers must absorb.[25] As shown in Table 2 of my Revised Affirmative Testimony, however, average retail energy rates are significantly lower than the full value of CG exports.[26] Even under a net metering regime, RMP

[24] Charles Teplin et al., Rocky Mountain Institute, *The Growing Market for Clean Energy Portfolios: Economic Opportunities for a Shift from New Gas-Fired Generation to Clean Energy Across the United States Electricity Industry,* 2019, p. 49, https://rmi.org/cep-reports.
[25] *See, e.g.*, *Steward Rebuttal*, lines 119-21; *Hayet Rebuttal*, lines 102-05.
[26] *Constantine Revised Affirmative*, line 322 (Table 2).

corporate shareholders still receive a windfall, and no costs are "shifted" onto non-CG ratepayers.

Moreover, CG solar has never been "subsidized" by RMP or other ratepayers, and there exists no evidence in the record to the contrary. Ms. Steward contends that "[t]he solar industry has already had the benefit of subsidies for many years, which have likely supported the decline in costs which enable solar to now be a more competitive resource."[27] While she is apparently referring to government subsidies, she certainly offers no proof that either RMP or its ratepayers have provided those alleged "subsidies." To the extent that Ms. Steward intends to imply otherwise, her contentions are without merit and should not be credited in the absence of real evidence bearing on the relative costs and benefits of CG solar exports. And to the extent Ms. Steward refers to government subsidies, those are distinct from rate-based subsidies and thus have no bearing on ratemaking. It should not be lost on this Commission that government subsidies also extend to energy sources other than solar, including but not limited to fossil fuels[28] and dwarf government subsidies to the solar industry.

Even under the current Transition Program's ECR (which RMP seeks to cut significantly), CG customers provide surplus benefits to the grid, RMP shareholders,

[27] *Steward Rebuttal,* lines 126-29.

[28] *See, e.g.*, Environmental and Energy Study Institute, *Fossil Fuel Subsidies: A Closer Look at Tax Breaks and Societal Costs*, p. 2, July 2019, https://www.eesi.org/files/FactSheet_Fossil_Fuel_Subsidies_0719.pdf ("The federal government provides numerous subsidies, both direct and indirect, to the fossil fuel industry. Special provisions in the U.S. tax code designed to specifically support and reward domestic fossil fuel-related production are direct subsidies. Other provisions in the tax code aimed at businesses in general create indirect subsidies that are not exclusive to the fossil fuels industry. In certain cases, quantifying these subsidies is fairly simple. In the case of indirect subsidies, establishing an amount associated with these subsidies is more challenging. While not covered in this fact sheet, another source of federal aid to the fossil fuel industry is the discounted cost of leasing federal lands for fossil fuel extraction. Some fossil fuel subsidies provide public assistance, such as the Low Income Home Energy Assistance Program (LIHEAP), which assists low-income households with heating costs.").

and other ratepayers without compensation. RMP pays customer generators 3.4-9.2 cents per kilowatt hour of exported energy, and then sells that energy to other ratepayers for 10.2 cents per kilowatt hour.[29] Other than unsubstantiated assertions that CG exports somehow saddle RMP with additional costs, no witness has shown that non-customer generators do not benefit and receive value from each kilowatt hour of CG exports. Thus, even under RMP's transition rate for CG exports, customer generators do not receive any subsidy or shift costs onto other ratepayers.

Q. How do you respond to critiques of Vote Solar's assigned value to avoided energy costs?

As Dr. Milligan points out in his Rebuttal and Surrebuttal testimony, in setting a value for avoided energy costs, RMP relies on a flawed GRID model that, among other things, uses historical pricing data that cannot possibly account for future changes to the grid. RMP's GRID model output attributes the bulk of the cost saving from CG solar comes to reduced coal generation, but during peak periods, other, more expensive resources would be turned down first and thus would provide more savings than RMP acknowledges. Moreover, as Dr. Milligan demonstrates in his rebuttal, the backwards looking prices do not accurately represent a forecast of *future* prices, which serves to drive down avoided energy costs dramatically.[30] Perhaps recognizing the limitations of the GRID model, PacifiCorp has indicated that it intends to retire the GRID model and replace it with another, presumably more robust model to calculate avoided energy costs.[31] The Commission should not accept a proposed value for avoided energy cost

[29] DPU, *Direct Testimony of Robert A. Davis*, Mar. 3, 2020, lines 430-31.
[30] *Milligan Rebuttal*, lines 167-69.
[31] *Id.* at lines 319-23.

based on a flawed, outdated, and soon-to-be retired model whose flaws are readily apparent.

In contrast, Dr. Milligan uses the OFPC, which itself is produced by RMP's parent company, PacifiCorp.[32] The OFPC is forward-looking and capable of accounting for crucial variables like resource retirements, changes in the transmission network, shifts in demand, and other changes to the grid.

Q. How do you respond to critiques of Vote Solar's assigned value to avoided capacity costs?

As Dr. Milligan explained in his Revised Affirmative Testimony,[33] CG exports during times of system peak decrease the amount of energy capacity that RMP requires to serve its customer demand. This undeniable value can, and should, be quantified—as Dr. Milligan has done[34]—and factored into the ECR.

RMP purports to justify assigning zero value to avoided capacity costs based on the characterization of CG exports as a "non-firm resource," meaning there is no contractual commitment to deliver CG solar-generated energy to RMP.[35] This argument is a red herring and lacks merit. Customer generators and their exports are entirely captive; there is no buyer but RMP to whom a CG customer can sell exports, regardless of whether there is a formal sales contract with RMP. Customer generators also make substantial long-term investments in their solar arrays, which makes their exports quantifiable and sufficiently reliable to value. The implication that CG solar

[32] *Id.* at lines 109-11, 199.
[33] *Milligan Revised Affirmative*, lines 359-61.
[34] *Id.* at 557-66.
[35] *MacNeil Direct*, lines 66-68.

generators would abandon their fixed-cost investment and stop exporting has no basis in economic reality and speculation that consumers will act against their own economic interests cannot be the basis of valid ratemaking. In any event, there is certainly no evidence offered by any party to this proceeding demonstrating that CG solar generation is likely to be abandoned. These customer investments will produce CG exports for at least twenty years. RMP has every ability to measure those exports and profit from them. It, therefore, has no basis to disregard the avoided capacity benefits that CG exports provide based on the irrelevant observation that solar exports are not subject to a contractual commitment, especially when RMP also fails to consider and value the immense avoided capacity costs from behind-the-meter consumption. Dr. Milligan calculated avoided capacity costs using a reliable and tested method of which RMP has failed to offer any legitimate critiques.

Q. How do you respond to critiques of Vote Solar's assigned value to transmission and distribution costs?

A. RMP witness Jacob Barker states that (i) the value of T&D capital investment deferral is "difficult to quantify," (ii) relying on CG exports "to defer capital investment places undue risk on the system," and (iii) the Company therefore has not included a value for T&D capacity deferral in its proposed export credit.[36] Vote Solar's witnesses explain, however, how CG exports can defer or avoid the need for transmission and distribution capacity related capital investment,[37] and they provide a reasonable calculation for

[36] *Barker Rebuttal*, lines 35-41.
[37] Vote Solar, *Revised Affirmative Testimony of Curt Volkmann* ("*Volkmann Revised Affirmative*"), May 8, 2020, lines 63-115.

avoided transmission and distribution capacity costs due to CG exports.[38] In his Rebuttal Testimony, Mr. Curt Volkmann provides examples of how CG exports materially reduce peak loads and the associated need for capacity-related T&D capital investments.[39] Likewise, in his Surrebuttal Testimony, Mr. Volkmann notes that every other jurisdiction in the U.S. with an established value-of-solar methodology and tariff has included a component for T&D capacity deferral.[40] Indeed, Pacific Power in Oregon, a PacifiCorp company, includes a component for T&D capacity deferral in its value-of-solar calculation.[41]

DPU witness Robert Davis states, without evidence, that, at the current penetration of CG in the State of Utah, there is little capacity avoidance.[42] His statement is demonstrably false. Mr. Volkmann and Dr. Yang illustrate that, even at the current level of CG penetration, CG exports materially reduce peak loads and can thereby defer or eliminate the need for T&D capacity investments.[43] If rates are adopted that fairly compensate CG solar, solar penetration will increase and there will be further material capacity avoidance.

OCS witness Philip Hayet states that exported energy from CG is non-firm, and it is therefore inappropriate to include an export credit component reflecting avoided T&D capacity.[44] Mr. Hayet's contention that T&D costs should not be credited because CG

[38] Vote Solar, *Revised Affirmative Testimony of Spencer S. Yang* ("*Yang Revised Affirmative*"), May 8, 2020, lines 180-187.
[39] Vote Solar, *Rebuttal Testimony of Curt Volkmann*, July 15, 2020, lines 172-246.
[40] *Volkmann Surrebuttal*, lines 78-82.
[41] Pacific Power, *UM 1910—Updated Values for Resource Value of Solar Calculation*, July 18, 2019, https://edocs.puc.state.or.us/efdocs/HAD/um1910had155442.pdf.
[42] *Davis Rebuttal*, lines 177-78.
[43] *Yang Revised Affirmative*, lines 80-133, 275-342; *Volkmann Revised Affirmative*, lines 63-115.
[44] *Hayet Rebuttal*, lines 610-714.

solar is not a "firm" resource fails for the reasons I have already described above relating to avoided energy costs.

Q. Should CG exports' environmental and health benefits be excluded from Vote Solar's ECR?

A. No. Dr. Berry and I explained the host of environmental and health benefits that come from CG exports.[45] For example, we explained previously that climate change and environmental damage brought on by intensive fossil fuel use for energy are threats that customer generation of solar energy helps to remediate. These are direct threats to RMP itself, yet RMP ignores these benefits. Due to the carbon emissions embedded in conventional electricity generation and the nature of transmission and distribution infrastructure, electric utilities like RMP are among the most vulnerable industries to climate- and environment-related risks.[46] These risks include, among others, (1) physical risks (impacts to assets and operations due to physical climate impacts); (2) financial risks (impacts to the cost of capital due to climate-related exposure and confidence in risk management); (3) economic risks (risk of stranded assets or decreased sales due to increased viability of alternatives); (4) regulatory risks (impacts to operating and capital costs due to changing regulations); and (5) reputational risks (loss of goodwill due to perceived response to climate change). This has been seen with devastating effect in the recent wildfires in the Western United States; areas of

[45] *Berry Revised Affirmative*, lines 646-780

[46] The Task Force on Climate-Related Financial Disclosures identified the energy sector, including electric utilities, as one of four non-financial groups with "the highest likelihood of climate-related financial impacts." *Final Report: Recommendations of the Task Force on Climate-Related Financial Disclosures*, June 2017, p. 16, https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-2017-TCFD-Report-11052018.pdf.

California, in particular, have required preemptive grid shutdowns or been constantly on the brink of doing so.

Dr. Berry has already cited the EPA's publication "*Public Health Benefits per kWh of Energy Efficiency and Renewable Energy in the United States: A Technical Report,"* which identifies several health ailments resulting from fossil fuel pollutants.[47] Many recent publications likewise support the inclusion of pollution pricing in setting public policy, including from the Environmental Defense Fund[48] and MIT.[49] While not specifically aimed at ECR valuation, these reports highlight the inclusion of price signals to encourage solar development as an offset to environmental and health costs from traditional generation. Dr. Berry calculates the values of these benefits using sound methods, and RMP offers no legitimate or science-based reasoning justifying any failure to account for these critical benefits in the Commission's ruling.

Solar offers customers a carbon-free alternative to the options that the present-day grid provides. Rooftop solar performs just like central station solar, is closer to load, and allows customers to share in the cost of energy infrastructure that benefits all ratepayers. An energy portfolio that includes high penetrations of distributed energy resources ("DERs") costs less than an equivalent portfolio that instead includes gas assets or even just central station renewables. Rocky Mountain Institute ("RMI") found, for example, that if "the economic value of clean energy portfolios can be fully captured, customers would save $29 billion through 2040 and the electricity sector

[47] *Berry Revised Affirmative*, line 657 n.72.
[48] Environmental Defense Fund, *The true cost of carbon pollution*, https://www.edf.org/true-cost-carbon-pollution.
[49] Nancy Stauffer, *Researchers find benefits of solar photovoltaics outweigh costs*, Energy Futures, Spring 2020, https://news.mit.edu/2020/researchers-find-solar-photovoltaics-benefits-outweigh-costs-0623.

would reduce CO2 emissions by 100 MT/year."[50] RMI further notes that the inclusion of DERs in clean energy portfolios facilitated over 85% of those savings, and that was without modeling the full benefit of customer generation/storage hybrids.[51]

In short, Vote Solar has demonstrated the propriety of including environmental and health benefits in its ECR. These benefits are substantial and benefit all ratepayers, and under RMP's rate, customer generators receive no compensation for then. That is an unjust outcome. This Commission should adopt Vote Solar's findings, which include a calculation of the avoided environmental and health costs from CG exports.

Q. How do you respond to RMP assigning zero value to the benefits of avoided carbon costs?

RMP's assignment of zero value to avoided carbon costs from CG exports is at odds with the practices of its parent company, PacifiCorp, which has acknowledged that the risk of carbon costs must be priced into future fossil generation investments. For example, in its Securities and Exchange Commission 10K filing, PacifiCorp stated that climate related issues "may have a direct impact on the costs of electricity production and increase the price customers pay or their demand for electricity."[52] PacifiCorp's statements acknowledge the value of avoided carbon costs. Its public filing also noted that "[e]nvironmental laws and regulations continue to evolve, and PacifiCorp is unable

[50] Charles Teplin et al., Rocky Mountain Institute, *The Growing Market for Clean Energy Portfolios: Economic Opportunities for a Shift from New Gas-Fired Generation to Clean Energy Across the United States Electricity Industry,* 2019, p. 47, https://rmi.org/cep-reports.
[51] *Id.* at p. 49.
[52] Berkshire Hathaway Energy Company et al*.,* Annual Report, Form 10-K, Dec. 31, 2019, p. 76, https://www.brkenergy.com/assets/upload/financial-filing/BHE%2012.31.19%20Form%2010-K_FINAL.pdf.

to predict the impact of the changing laws and regulations on its operations and financial results."[53]

It is possible to quantify the risks PacifiCorp describes in its SEC filings. Indeed, PacifiCorp does so. Its 2019 IRP shows RMP's estimated future carbon compliance costs as part of its planning, thus explicitly factoring in future carbon costs in its decision-making.[54]

In short, carbon prices are already incorporated into RMP's 2019 IRP in a way that increases total system costs, and this is exactly what Vote Solar's experts use to quantify this benefit. CG exports reduce this uncertainty and resulting costs because CG exports emit no carbon. It is illogical and contrary to the mission of setting a fair and reasonable ECR to ignore these costs and reduce their value to zero, as RMP has done.

Q. How do you respond to RMP's assignment of zero value to local economic benefits from DG solar?

RMP has opposed giving any value to the local economic benefits that come with CG exports. This is a transparent attempt by RMP to convince the Commission not to assign value to the growth of one of its competitors and should be met with great skepticism by a body charged with protecting the public good in Utah. Meanwhile, as Dr. Berry notes, PacifiCorp is building or planning to build substantial renewable resources, a large portion of which will be located outside the State of Utah, for its own profit.[55] In effect, RMP seeks a subsidy (by underpaying for CG exports) so it can send

[53] *Id.* at p. 191.
[54] *Berry Revised Affirmative*, lines 739-42.
[55] *Berry Revised Affirmative*, lines 316-17.

jobs and economic benefits outside of Utah, while limiting the growth of in-state jobs and economic activity. Because RMP is effectively a business competitor of customer generators, the Commission should be especially wary of allowing RMP to build its own renewable empire on the backs of Utah CG solar customers and ratepayers.

Only Vote Solar has presented convincing evidence of the (positive) role CG solar will have in driving local economic growth. Ms. Beck even concedes that she "did not review in detail the studies and assumptions Vote Solar relied upon in its estimates of potential local economic benefits" before concluding that "it appears to [her] that embedding [Vote Solar's] proposed level of benefits into the Export Credit Rate" is unreasonable.[56]

Q. Is there evidence in the record to warrant charging customer generators for "integration costs" or "wear-and-tear" related to their energy exports to the grid?

A. No. RMP attempts to impose integration costs that are not grounded in any reliable evidence or the facts regarding its own practices. As Dr. Milligan explained in his Rebuttal Testimony and Mr. Volkmann explained in his Revised Affirmative Testimony,[57] there is no basis for including integration costs in the ECR. First, there exists no scientifically valid, generally accepted method for calculating integration costs, so RMP's calculation is inherently subjective and inadmissible. In fact, there is no evidence that integration costs are actually incurred at the current CG penetration level. Second, CG solar can provide the grid services that integration costs supposedly

[56] *Beck Rebuttal*, lines 150-53.
[57] *Milligan Rebuttal*, lines 537-40; *Volkmann Revised Affirmative*, lines 277-359.

cover. Third, including speculative integration costs in the ECR is discriminatory—conventional resources like gas and coal do not receive the same assessment even though they impose integration costs on the grid.

DPU's suggestion that wear-and-tear costs be assessed against CG exports is similarly flawed. As Mr. Volkmann explains in his Rebuttal Testimony,[58] there is simply no evidence that these costs are incurred. On the contrary, CG customers should be credited for using technology that can provide grid services, like smart inverters, which can help RMP defer or avoid capital investments in voltage-regulating equipment. Customer generators, therefore, should not be charged for integration costs.

Q. Does Vote Solar's proposed ECR account for all the benefits that CG exports provide?

A. No. Vote Solar's proposal is conservative, both in terms of its proposed return to net metering and its cost/benefit calculations. Vote Solar's calculation does not consider other benefits from CG exports, such as ancillary services, reliability and resiliency value, avoided fossil fuel lifecycle costs, reduced security risk, and market price impacts. Vote Solar has limited its proposed ECR to only some of the benefits that accrue in front of the meter, which makes its value calculation for CG exports a conservative estimate of the benefits provided.

Vote Solar's proposal also does not quantify the benefits from customer generators' "behind-the-meter" usage of the energy they produce. This usage results in less energy that RMP needs to produce; fewer line losses for RMP while transporting energy;

[58] *Volkmann Rebuttal*, lines 157-58.

smaller required investments in generation equipment and capacity; and the host of social, environmental, and health benefits that come from an energy source that spurs local job growth and reduces carbon emissions and compliance costs. Although not factored into Vote Solar's calculation of an appropriate ECR, the Commission should keep these benefits in mind, as RMP's proposed rate would effectively kill CG growth in Utah. That, in turn, will result in substantial costs accruing to RMP's ratepayers that could otherwise be offset by CG growth.

Q. Does Vote Solar agree that RMP's proposed rate for CG exports is just and reasonable?

No. RMP now proposes to reduce the amount by which customer generators are compensated by over 80%. RMP reaches this exceedingly low rate by heavily or entirely discounting nearly every benefit that CG solar provides. As Dr. Lee has outlined in his surrebuttal testimony, RMP's rate would lengthen the payback period for an average residential investment in solar to nearly 22 years.[59] This would coincide the expected lifetime of many CG investments and, consequently, would reduce or eliminate the adoption of CG technology. All ratepayers and the grid will consequently suffer from increased dependence on fossil fuels and the costs, investments, and externalities that accompany them.

Vote Solar, based on the detailed analysis of its experts, proposes a return to net metering or a single rate for exports—24.17 cents per kilowatt hour—either of which

[59] *Lee Surrebuttal*, line 83 (Table 1).

is reasonable, easy to understand, easy to administer, and easy to act upon, while RMP proposes an ECR based on an artificially low valuation of the benefits of CG exports.

VI. COMPARISON OF ECR PROGRAM FEATURES

Q. Is RMP's "no netting" proposal a preferable framework for compensating CG exports over hourly netting?

A. It is not. RMP's "no-netting" proposal means that CG customers will be unable to offset their consumption of energy from RMP with their sale of energy to RMP. Under a "no-netting" structure, CG customers will receive no actionable price signal because the technology does not exist to allow CG customers to understand, in real time, whether they are a net importer or exporter. Thus, they are unable to appropriately plan the timing of their consumption around periods when they know they will be a net exporter.

An actionable price signal is one that drives customer behavior based on the price customers will pay or receive for a given item. For example, when a store charges a fee to ship an item to a customer, that sends a price signal that customers will spend less if they buy the item in store and more if they buy the item to be shipped at home. Customers then have the option of paying more for at-home delivery or less for an in-store purchase—but it is a well-informed, rational decision, and one that may change depending on how urgently a customer needs an item. But if price signals are too opaque (like not knowing what shipping an item cost until a month later), too confusing (like an ever-changing shipping formula) or too minimal (like charging only one cent for shipping), then they cease to have the same effect in driving customer behavior.

RMP's proposal of no netting means that CG customers will have to take stock of their export and consumption 3,600 times each hour to understand whether they are a net exporter and to try to plan their consumption accordingly. This is unworkable primarily because customers do not have the technology or means to understand their generation and consumption at this level of granularity. Even if customers had unlimited access to information and understood that they were exporting at 3:07pm, there is no reasonable way for them to understand whether they will be exporting continuously over the next 45 minutes when deciding whether to run a load of laundry or their dishwasher. The sun may disappear for a few minutes; the washing machine or dishwasher may enter a portion of its cycle fifteen minutes later where it consumes more energy; and any number of other variables may affect whether a customer generator's exports momentarily exceed consumption. One key to an actionable price signal is a long enough period in which consumption can reasonably take place or be scheduled—or not take place or be scheduled, in favor of deferring consumption to another block of time. Under RMP's proposal, customer generators will lack the knowledge to defer consumption until times when they are an exporter because the period is too small to plan around.

Vote Solar proposes that exports be netted on an hourly basis.[60] This allows customers to understand their usage and export patterns so they can plan their consumption in hourly blocks accordingly. Hourly netting serves the goal of having customer generators make economically rational choices, like choosing when to run energy-

[60] *Constantine Revised Affirmative*, lines 76, 376-77, 386-423.

heavy appliances. Moreover, hourly netting reflects daily life. Utah families cannot accommodate narrow fifteen-minute timeframes when planning dinner; television viewers cannot speed up their favorite shows to finish in fifteen minutes; dishwashers generally cannot start and finish in a fifteen-minute block of time. Hourly netting sends an actionable price signal, which benefits all ratepayers by driving customer generators' consumption to times of lower demand. This is precisely what any ECR should do. RMP is wrong when it argues that customers can understand the features of its rate structure such as "no netting" and that its ECR proposal will cause customer generators to drive their exports toward peak hours and consumption toward off-peak hours.[61]

Q. Does RMP's proposed ECR better incentivize CG exports during peak hours and CG consumption during off-peak hours?

A. No. Under RMP's proposal, the price customers will be paid for CG at peak value, 2.413 cents per kilowatt hour, is so low when compared to the price customers will pay for energy from RMP, 10.2 cents per kilowatt hour, that customers will be incentivized to consume as much power as they can.[62] RMP has also failed to introduce any evidence to show that the peak and off-peak rates it proposes are different enough in magnitude to push consumption from peak to off-peak times.

And RMP's proposed peak and off-peak periods for CG do not match peak periods that RMP has set in other rate schedules.[63] This means that while non-CG customers are being incentivized to avoid consumption during peak periods, CG customers are being

[61] *Meredith Rebuttal*, lines 40, 120-23.
[62] *Berry Rebuttal*, lines 291-98.
[63] *Id*. at lines 47-48, 203-13.

incentivized to consume during peak periods. Driving inefficient consumption during peak periods, and discouraging exports when the grid needs it most, are counterintuitive results that the Commission should not permit.

Q. Does RMP's proposal that the ECR be updated annually, rather than be fixed for twenty years, better account for changing conditions?

A. No. RMP seeks to inject unnecessary uncertainty into potential CG customers' investment decisions by resetting the ECR each year for all Schedule 137 customers. An annual update removes any certainty from CG customers who are contemplating what, for most Utah families, are substantial investments that they make for a variety of reasons: to reduce their dependence on fossil fuels, to provide self-sustaining energy and reduce dependence on a monopolistic utility, to improve the environment through clear energy, or simply to recover the costs of their investment in power generation by sharing their excess energy with their neighbors.[64] The numerous comments received by the Commission in the proceeding reflect the diversity of reasons why Utahns desire to install rooftop solar. Although some customers may be unaffected by annual price changes, most customers would undoubtedly be unwilling to make the substantial personal investment that CG requires with this uncertainty lingering.

Vote Solar proposes that a customer generator's ECR be fixed for a period of 20 years. Customer generators should be able to evaluate the impact that an investment in solar would have on their personal finances, and a long-term rate allows customers to estimate, albeit roughly, their exports and the credits they will received. By investing

[64] *Constantine Rebuttal*, lines 332-34, 380-87.

substantial private capital in their own energy source, individual families and businesses fix a portion of their energy costs and can reduce their monthly expenses once their system is paid off, similar to a mortgage. Customer generators should have the certainty of a long-term rate when adopting solar technology, even if the ECR changes gradually for future customer generators.

Mr. MacNeil acknowledges that RMP "already offers a 15-year fixed price option for fixed-tilt solar resources under Utah Schedule 37,"[65] and I described in my Revised Affirmative Testimony how RMP's own Subscriber Solar program allows customers to fix the price they pay for solar energy for a period of 20 years.[66]

Q. Does RMP's proposal to update the ECR annually better adhere to principles of gradualism by permitting changes to take place over a longer period of time?

No. Good rate design should account for the fact that similarly situated individuals should be charged or credited similar rates. RMP now proposes to reduce the amount by which customer generators are compensated by over 80%. This is an unwarranted and sudden decrease to a rate not only well below what is just and reasonable, but also well below what current customer generators receive. That a new customer generator in 2021 may receive less than one-fifth in compensation per exported kilowatt hour compared to what a customer generator exporting in 2020 receives clearly violates the principle of gradualism.

Ms. Beck opines that updating the ECR each year is appropriate to allow for changing conditions; for instance, to quantify carbon pricing.[67] But she provides no justification

[65] *MacNeil Rebuttal*, lines 1101-02.
[66] *Constantine Revised Affirmative*, lines 446-49.
[67] *Beck Rebuttal*, lines 168-81.

for updating solar customers' rates more frequently than other rates for other customers who are in the same class for cost-of-service regulation. Nor does she address the inconsistent treatment between Schedule 137 customers and RMP's Subscriber Solar customers and wholesale providers.

Q. Should the Commission adopt RMP's proposal that excess export credits expire at the end of each year?

A. No. RMP proposes to have export credits expire each year, purportedly to ensure that customers properly size their solar systems.[68] Yet, RMP has failed to offer any evidence that taking credits away will accomplish this goal. RMP seeks to pocket the profits from those exports—which RMP will sell to other customers at full retail rate—for its corporate shareholders, while paying nothing in return.

Vote Solar proposes that customer generators' excess export credits either rollover or be paid to customer generators at the end of each year.[69] Unlike RMP's proposal, it would incentivize customers to continue exporting, rather than consume, energy during times of peak demand. RMP's proposal would incentivize consumption for customers who might otherwise forfeit their credits. And as I explained in my earlier testimony, setting a cap on system sizes more efficiently encourages proper sizing and avoids taking value away from CG exporters.[70] Mandatory forfeiture also runs counter to the efficient use of energy resources.

Q. Is RMP's ECR proposal transparent and easy to understand?

[68] *Meredith Rebuttal*, lines 157-62.
[69] *Constantine Rebuttal*, lines 498-504.
[70] *Constantine Rebuttal*, lines 492-96.

A. No, and even a brief comparison demonstrates that Vote Solar's proposal is more transparent and easier to understand than RMP's proposal. Simplicity and transparency make up one of two principles that an ECR should serve, according to Ms. Beck.[71] Net metering is the most transparent option available and the one that is the easiest for customers to understand and RMP to administer. Ms. Beck does not address the transparency and simplicity of Vote Solar's proposal at all. She focuses only on the purported transparency of RMP's proposal. But RMP's proposal is not easy to understand for the reasons I described above, and it is certainly less simplistic and transparent that net metering. Ms. Beck also does not consider the complexity and opacity of CG customers being forced to make multi-decade investments without the stability of a fixed ECR from year to year.

Q. Does Vote Solar make any other recommendations for its ECR?

A. Yes. As I outlined in my earlier testimony, eligibility for each ECR vintage should be consistent with the terms of eligibility adopted for legacy access to the net metering program; and both existing net metering and transition customers should have the option to enroll in the new ECR program at their sole discretion.[72] Both of these promote transparency and stability.

VII. SUMMARY

Q. What are your recommendations?

A. This Commission should restore the net metering program, which remains an available option under the Settlement Stipulation. Vote Solar's statistically sound load research

[71] *Beck Rebuttal*, line 40.
[72] *Constantine Revised Affirmative*, lines 473-89, 512-17.

study and the work of Vote Solar's experts show the tremendous benefits that CG exports provide to the grid, RMP, and all ratepayers. These benefits vastly outweigh any costs of CG exports or administering the NEM program—neither of which RMP has proven exist to any reasonable degree. And they do not account for the benefits to the grid from CG customers' behind-the-meter usage of their produced energy. Alternatively, if the Commission chooses to set an ECR, it should value CG exports at 24.17 cents per kilowatt hour. It should also adopt the program features set forth by Vote Solar and not the punitive, unsubstantiated, confusing features proposed by RMP.

Q. Does this conclude your testimony?

A. Yes.

CERTIFICATE OF SERVICE

I hereby certify that on this 15th day of September, 2020 a true and correct copy of the foregoing was served by email upon the following:

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