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BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

In the Matter of the Application of Rocky Mountain Power to Implement the Programs Authorized by the Sustainable Transportation and Energy Plan Act	**Docket No. 16-035-36** UCE Exhibit 6.0 – Phase Three Rebuttal Testimony

PHASE THREE (ELECTRIC VEHICLES) SUREBUTTAL TESTIMONY OF SARAH WRIGHT

ON BEHALF OF

UTAH CLEAN ENERGY

DATED this 16th of May, 2017

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Sophie Hayes
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INTRODUCTION

Q: Please state your name, position, and business address.

A: My name is Sarah Wright. I am the executive director of Utah Clean Energy, located at 1014 2nd Avenue, SLC, UT 84013.

Q: On whose behalf are you testifying?

A: I am testifying on behalf of Utah Clean Energy (UCE).

Q: Did you previously file testimony on in Phase three of this docket?

A: Yes, I filed direct testimony in Phase three of this docket on April 6, 2017 and rebuttal testimony on April 27, 2017.

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

A. The purpose of my rebuttal testimony is to address the remaining issues to be litigated in this docket – the energy rate and time of use periods to apply during the electric vehicle time of use pilot program. All other issues have been resolved by stipulation of the parties. In this testimony, I present a TOU rate design proposal that we developed in consultation with the Office of Consumer Services and the Division of Public Utilities.

As discussed in my rebuttal testimony, for purposes of the pilot program, I, along with the Office of Consumer services, supported a compromise approach for adopting rates for the TOU pilot: two similar rate options, one with a tiered inclining block rate and one without. Including one tiered option will help us evaluate whether an inclining block TOU rate sends signals to conserve *and* shift usage to off peak times relative to a non-tiered TOU rate option.

Unfortunately, at the time of rebuttal testimony, Utah Clean Energy was not able to recalculate a rate proposal consistent with this recommendation because we did not have work papers from the Company with sufficient capability to calculate this rate. Since rebuttal testimony, Utah Clean Energy has received work papers from the Company and worked with analysts from OCS and DPU to put together a tiered TOU pilot program rate design (Tiered TOU Option 2).

UCE worked with OCS and DPU to develop Tiered Rate Option 2 to align closely with RMP's Rate Option 1, but with the addition of inclining blocks. We designed these rates with the following objectives: to maintain approximately the same differential between on and off peak as is used in RMP's Rate Option 1, but also to provide a meaningful differential between Tiers 1 and 2 for both on and off peak time periods. Also for the sake of consistency, we chose to adopt RMP's chosen on and of peak periods. I will discuss how we developed this rate in more detail below.

Utah Clean Energy recommends that the Commission approve RMP's Rate Option 1 and a Tiered Rate Option 2, as the two TOU rate options to study during the TOU pilot program. We further recommend that the Commission order a Compliance Phase of this proceeding, in order for the Company to verify the rates and bill impacts for this rate option.

TOU Rate Design

Q. Given your review of all the testimony filed by parties in this docket has your rate design proposal for the TOU pilot changed?

A. Not in concept, but we have now had an opportunity to evaluate numbers associated with the position I outlined in my rebuttal testimony. As I explained in my rebuttal testimony, I was persuaded that it would be useful in the pilot to study two similar TOU rates: one with inclining block rates and one without. Since that time, Utah Clean Energy has worked in consultation with the Office of Consumer Services and the Division of Public Utilities to develop an inclining block TOU rate proposal. Please see below and my Surrebuttal Work Papers for this proposal.

Consistent with my rebuttal position, I support a pilot program that utilizes two rate structures: 1) the Company's flat rate TOU Rate Option 1 and 2) a similar option that also includes an inclining two tier block rate (Tiered Rate Option 2). Utah Clean Energy supports including one tiered TOU rate option in this electric vehicle charging pilot program because electric vehicles have the potential to increase RMP's load – not just at peak times but overall. We believe it is in the best interest of ratepayers to evaluate whether a tiered TOU option creates an incentive for overall efficiency *as well as* load shifting relative to a non-tiered TOU option. This information will be valuable in developing TOU rates that are just and reasonable going forward after the pilot phase of this program. Please see Table 1 below that shows a summary of Tiered Rate Option 2 rates.

Table 1 – Tiered Rate Option 2

	TOU rate option 1 (Non-Tiered rate) (Company's rate option 1)	**TOU rate option 2 (Tiered rate)**
Customer charge – 1 Phase	$6.00	$6.00
Customer charge – 3 Phase	$12.00	$12.00
On peak Tier 1 (0-200 kWh)	22.2755 ¢/kWh	18.3316 ¢/kWh
On peak Tier 2 (>200 kWh)		22.2755 ¢/kWh
Off peak Tier 1 (0-800 kWh)	6.7880 ¢/kWh	6.1105 ¢/kWh
Off peak Tier 2 (>800 kWh)		7.7233 ¢/kWh

Q. How did you develop the tiers for this rate proposal?

A. First, for simplicity and consistency's sake, we decided to adopt RMP's proposed on and off peak time periods. Second, we determined a reasonable number of kilowatt hours to include in the first tier (on a monthly basis). To do this, we looked to average residential consumption, which is just under 700 kWh/month, and added 300 kWh to account for new energy demand associated with charging an electric vehicle. Thus, we included 1,000 kWh per month in the first tier.

Third, we divided these first tier kilowatt hours into on and off peak time periods based on historic load research data that shows that approximately 20% of residential

consumption occurs during the on peak hours, as defined by the Company in its TOU proposal. Thus, we assigned 200 kWh to on-peak, Tier 1 (20% of 1000 kWh), while we assigned 800 kWh to off-peak, Tier 1. On-peak, Tier 2 applies to consumption over 200 kWh during on-peak hours, and off-peak, Tier 2 applies to consumption over 800 kWh during off-peak hours.

Q. How did you develop the rates for this proposal?

A. First, we designed rates consistent with the following two design criteria: 1) maintain approximately the same differential between on and off peak as that used in RMP's Rate Option 1; 2) provide a meaningful differential between Tiers 1 and 2 for both on and off peak periods (to encourage efficiency and conservation).

We worked with the Office and the Division to develop our rates. OCS used the Company's load research data to create pivot tables that split the kWh into on and off peak based on 0-200 kWh and > 200 kWh on peak tiers and 0-800 kWh and > 800 kWh off peak tiers. We used these tables to calculate the percentage of kWhs across our tier categories during summer and winter. Then we applied these percentages to the on and off peak kWh for summer and winter months from Mr. Meredith's work paper, "Meredith Workpprs Copy UT EV TOU Pilot 1-31-2017" to calculate the forecasted kWh units for each of our proposed tiers.

Once we had the forecasted kWh units, we hard wired the on peak tier 2 price at the company's Rate Option 1 on peak price of 22.2755 ¢/kWh. We also calculated the 6.1105 ¢/kWh first tier off peak price based on Mr. Meredith's spreadsheets. The 6.1105

¢/kWh is based on moving 60% from the cost of energy at 3.4003 ¢/kWh and 40% from the average energy rate of 10.1759 ¢/kWh to a middle point of 6.1105 ¢/kWh.

After determining the off peak tier 1 price of 6.1105 ¢/kWh, we set the tier 1 on peak to be three times that (for a differential of 3:1). Hence, the tier 1 on peak price was set at 18.3316 ¢/kWh. Once the three energy prices were set (tier 1 on peak, tier 2 on peak, tier 1 off peak), we used goal seek to calculate the tier 2 off peak energy price, which turned out to be 7.7233 ¢/kWh.

Q. **Do you support the Company's proposed time of use periods for your proposed TOU option 2?**

A. For the purpose of this pilot program we support the company's time of use periods for TOU Rate Option 1 and Tiered Rate Option 2, as illustrated in Table 1, above.

Q. What is the differential between the on and off peak rates?

A. The differential between the on peak and off peak rates in Tier 1 is 3:1. The differential between the on peak and off peak rates in Tier 2 is 2.9:1. The differential between the second on peak tier and the first off peak tier is 4:1.

Q. What is the differential between tiers 1 and 2 in both the on and off peak periods?

A. The difference between the off peak first and second tier is just over 1.6 cents. The Difference between the on peak first and second tiers is just under 4 cents.

Q. What are the bill impacts of this proposal?

A. The bill impacts of this proposal are shown below in Table 2 (with the bill impacts of the Company's Rate Option 1 shown below that in Table 3 for comparison).

Table 2 – Bill impacts of Tiered Rate Option 2

	Present Sch 1	% of Switching from On-Peak to Off-Peak									
kWh	0%	0%	Saving	10%	Saving	25%	Saving	50%	Saving	75%	Saving
500	$55	$53	5%	$51	7%	$49	11%	$46	18%	$42	24%
698	$78	$71	9%	$69	12%	$66	16%	$61	22%	$56	28%
750	$85	$76	10%	$74	13%	$71	16%	$65	23%	$60	29%
1,000	$114	$100	12%	$97	15%	$93	19%	$87	24%	$80	29%
1,250	$146	$128	12%	$124	15%	$118	19%	$110	25%	$102	30%
1,500	$179	$157	12%	$152	15%	$145	19%	$133	25%	$124	30%
1,750	$211	$186	12%	$180	15%	$171	19%	$157	26%	$146	31%
2,000	$243	$215	12%	$208	14%	$198	19%	$181	26%	$168	31%
2,500	$308	$273	12%	$264	14%	$252	18%	$231	25%	$212	31%
3,000	$373	$330	11%	$320	14%	$305	18%	$280	25%	$256	31%

Table 3 – Bill Impacts of RMP Rate Option 1

		Present	Sch 2E - % of Switching from On-Peak to Off-Peak								
kWh		0%	0%	Saving	10%	Saving	25%	Saving	50%	Saving	75%	Saving
500		$55	$60	-9%	$58	-5%	$56	0%	$51	8%	$47	16%
698	*	$78	$81	-4%	$79	-1%	$75	4%	$69	12%	$63	20%
750		$85	$87	-3%	$84	0%	$80	5%	$73	13%	$67	21%
1,000		$114	$114	0%	$110	3%	$105	8%	$96	16%	$87	24%
1,250		$146	$141	4%	$136	7%	$130	11%	$118	19%	$107	27%
1,500		$179	$168	6%	$162	9%	$154	14%	$141	21%	$127	29%
1,750		$211	$195	8%	$188	11%	$179	15%	$163	23%	$147	30%
2,000		$243	$222	9%	$214	12%	$204	16%	$186	24%	$168	31%
2,500		$308	$275	11%	$266	14%	$253	18%	$230	25%	$208	33%
3,000		$373	$329	12%	$318	15%	$302	19%	$275	26%	$248	33%

Q. Why should the Commission approve your recommendation when it is being presented at the time of surrebuttal?

A. The concept behind UCE's proposal is not new and represents sound ratemaking principles. UCE has been working closely with the Office and the Division since filing rebuttal testimony to ensure that Tiered Rate Option 2 is something they can support as well. I recommend the Commission approve the compromise approach supported by UCE, the Division, and the Office to implement two TOU pilot rates – one with and one without tiers. I further recommend that the Commission order a compliance phase to allow the Company time to verify the Tiered Rate Option 2 rates and ensure bill impacts are reasonable.

RESPONSE TO RMP

Q. Mr. Meredith claims that both of the company's proposals encourage energy efficiency in all hours (lines 436-441). Do you agree?

A. No. An off-peak rate of 3.4 cents applied to 80% or more of residential consumption does not encourage conservation or efficiency and may have long term negative consequences.[1] Such a low rate for the majority of hours could lead to customer decisions to invest in *more* electricity consuming devices and use *more electricity* at economically inefficient and unsustainable levels. This is inconsistent with the principle of conservation of electric resources. The more moderate differential provided in the

[1] See Page 7 of Sarah Wright's Direct Testimony for additional discussion.

Company's Rate Option 1, alongside a tiered TOU rate option, will provide more durable rates to test in this pilot program.

Q. Mr. Meredith argues that non-tiered time of use rates send better price signals to conserve than tiered TOU rates because conservation measures that target peak prices are valued higher in the IRP (lines 481-494). What are your thoughts on his conclusion?

A. Mr. Meredith offers some analysis to support his position, but I do not find it persuasive enough to exclude a tiered TOU rate as part of this pilot. Inclining tiered rates have been used for years to encourage conservation, and are currently employed in residential rates in Utah for that purpose. A TOU rate without inclining tiers may encourage profligate electricity use in off peak hours. For example, customers may over-cool their homes during off-peak hours to reduce consumption during peak hours. Tiered pricing coupled with TOU rates encourages conservation and energy efficient behaviors in all hours – taking steps such as turning off lights, adjusting thermostats, using blinds – *as well as* an incentive to charge EVs in off peak hours. Tiered rates have been used in Utah for over 15 years to encourage conservation and to encourage investments in energy efficient technologies and appliances. Mr. Meredith has not provided sufficient justification for moving away from this important, longstanding rate design. Therefore it should be studied during the EV TOU pilot.

Q. In his rebuttal testimony Mr. Meredith explains that energy charges in this electric vehicle pilot should not include inclining block pricing (lines 497-524). Do you agree?

A. No. Inclining block tiered rates coupled with TOU are completely appropriate for an electric vehicle incentive program. Even if a customer does all their charging on Tiered Rate Option 2's second tier off peak rate they still will save significantly compared to gas. It will only cost about $26 dollars to travel over 1100 miles per month![2] An efficient gas vehicle that gets 35 miles per gallon traveling 1123 miles per month would cost over $80 dollars in monthly fuel costs.

Q. Mr. Meredith claims that including TOU pricing with inclining block pricing will be too confusing for customers and undermine PEV adoption (lines 509-517). Do you agree?

A. No. As I stated in my direct and rebuttal testimony, Utah ratepayers already have tiered pricing, and we are only layering the TOU pricing onto the tiered rates that customers are already well accustomed to and familiar with.

Q. Mr. Meredith states that UCE's proposed rates run contrary to the core principles that he espoused in his direct testimony and were also discussed at the workshops (lines 582-618). What is your response to Mr. Meredith's statement?

A. For clarification, there was never a consensus on the principles for the rate design for this tariff. But I respond to his concerns below.

[2] The U.S. Department of Transportation, Federal Highway Administration, states that an average American drives 13,476 miles per year, i.e., 1123 miles per month. An average EV consumes 30 kWh for every 100 miles (0.3 kWh per mile). *See* https://www.fhwa.dot.gov/ohim/onh00/bar8.htm; https://www.fueleconomy.gov/feg/noframes/34918.shtml.

- Mr. Meredith claims that inclining block pricing will dis-incentivize electric vehicle adoption

I have addressed this previously in my testimony and above. EV owners will save money on a TOU tiered rate if they charge off peak.

- Promoting Economic Efficiency - UCE tiered rate TOU option provides a weaker signal to shift usage to off peak than the company's options

The tiered TOU option *promotes economic efficiency* by sending price signals to encourage customers to shift their usage from on peak to off peak hours *and* to conserve energy and make economically and energy efficient decisions.

Importantly, Utah residents are already accustomed to tiered rates. Adding TOU on top of tiered rates will require education just as a shift to non-tiered TOU rates will require education. But a tiered TOU option will encourage customers to shift usage to off peak while still sending signals to conserve energy at all times – all while simultaneously saving electric vehicle owners on their fuel costs!

RESPONSE TO WESTERN RESOURCE ADVOCATES

Q. Mr. Wilson mentions that the issue of energy efficiency should be addressed in a general rate case instead of this pilot program (lines 65-70). Do you agree?

A. No. Energy conservation is an equally important component of any rate design, including EV TOU rates. The intent of this pilot is to inform rates. We cannot ignore the principles of energy efficiency and conservation in this pilot. We must gather information

that we can use outside of the pilot program. Including a rate structure with an inclining block rate will provide this information.

Q. Mr. Wilson states that, since the pilot is limited to few participants, adding tiered rates will complicate the analysis (lines 73-79). What is your response to this statement?

A. I disagree. Utah Clean Energy has not proposed studying more than two rates. In my rebuttal testimony, I was persuaded by other witnesses that a pilot that studied two similar TOU rate designs – one with and one without tiered rates – was in the public interest. This will enable us to analyze and compare the impact of the TOU component and the tiered pricing component. Even though this pilot is limited to small number of participants, the real purpose of this program is to test EV TOU rates that we can use in the future. *As the EV market continues to grow and there is increasing EV load on the grid, we want to ensure that our rates send the right signals to shift usage and encourage energy conservation in all hours.*

Q. Mr. Wilson mentions that he is not concerned with the impact on the price of energy for uses other than EV charging (lines 81-90). What is your response?

A. Mr. Wilson has not acknowledged that, even though this is a pilot program, the ultimate objective is to inform EV TOU rates that we can adopt in the future. If we ignore the issue of rate impacts on different customers and other usage, the load research study will be testing rates that don't make any sense for the long term. This study is not just a science experiment, but rather an expensive study, at a cost to ratepayers, to inform future

rates. Utah Clean Energy supports electric vehicles, but we do not want to sacrifice efficiency, conservation, or other public interest goals for purposes of this pilot program.

CONCLUSION

Q. Please summarize your testimony.

A. Utah Clean Energy recommends that the Commission adopt two TOU rates for the TOU pilot program: the Company's Rate Option 1 and our proposed Tiered Option 2. I further recommend that the Commission order a compliance phase following their order so the Company may verify and implement this proposal.

Q. Does this conclude your testimony?

A. Yes.