BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

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In the Matter of the Application of Rocky	)	**Docket No. 16-035-36**
Mountain Power to Implement Programs	)	**DPU Exhibit PIII 1.0 DIR**
Authorized by the Sustainable	)	
Transportation and Energy Plan Act	)	
	)	

DIRECT TESTIMONY – PHASE III

OF

ROBERT A. DAVIS

ON BEHALF OF THE

UTAH DIVISION OF PUBLIC UTILITIES

April 6, 2017

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Introduction and Purpose of Testimony

Q: Please state your name and occupation.

A: My name is Robert A. Davis. I am employed by the Division of Public Utilities (Division) at the Utah Department of Commerce as a Utility Analyst in the Energy Section.

A: Are you the same Robert A. Davis who testified in Phase One and Phase Two in this docket on behalf of the Division?

A: Yes. I provided direct and rebuttal testimony in Phase One and direct testimony in Phase Two in this same Docket No. 16-035-36.

Q: What is the purpose of your testimony in this phase of the proceeding?

A: My Phase Three testimony presents the Division's analysis and findings in response to Rocky Mountain Power's (Company) Supplemental Application to implement the Company's Electric Vehicle (EV) infrastructure incentive program and accompanying time of use (TOU) tariff sheets.[1] Specifically, the Division recommends the Commission approve only the Company's Electric Vehicle (EV) infrastructure incentive program and accompanying tariff sheet Schedule No. 120. At the time of the parties' direct testimony filing, consensus has not been reached on the Company's proposed Schedule No. 2E.

[1] The tariff is to be implemented by July 1, 2017. The initial step of the EV Program during Phase One was necessary so the Company could begin collecting the necessary funding which began January 1, 2017 to get the pilot program started.

Silence by the Division on any topic does not represent a position of support for or opposition to any particular issue.

Background of STEP

Q: Please provide a brief history of the STEP Program that will be addressed in Phase Three of this proceeding.

A: Senate Bill 115 (SB 115), the Sustainable Transportation and Energy Plan Act, was passed during Utah's 2016 legislative session. SB 115 was codified in part at Utah Code Ann. Section 54-7-12.8 and entitled "**Electric energy efficiency, sustainable transportation and energy, and conservation tariff**."[2] Section 54-7-12.8(6) outlines the funding for the STEP Program. Pursuant to the Phase One Scheduling Order and Notice of Second Scheduling Conference issued on September 26, 2016, the Commission held a scheduling conference in this docket on October 17, 2016. The parties stipulated to a split schedule due to the complexity and timing of component implementation of the Company's application.[3]

On February 7, 2017, the Office of Consumer Services (OCS) filed a motion to amend the

[2] While Section 54-7-12.8 addresses the tariff and funding, Section 54-20-103 addresses the electric vehicle incentive program's statutory substance.
[3] See Report and Order, In the Matter of the Application of Rocky Mountain Power to Implement Programs Authorized by the Sustainable Transportation and Energy Plan Act, 16-035-36, December 29, 2016, pp. 6-8.

scheduling order and requested a scheduling conference to discuss electric vehicles.[4] On February 16, 2017, the parties stipulated to establish a Phase Three schedule in this docket to address the EV portion of the STEP program.[5]

The hearing for Phase One was held on November 30, 2016 with hearings for Phase Two and Phase Three scheduled for April 18, 2017 and May 23, 2017,[6] respectively. The Commission issued its Report and Order for Phase One on December 29, 2016. The Commission approved PacifiCorp's STEP funding of $50 million from 2017 through 2021, representing an annual increase of $10 million per year for the exception of those programs scheduled for Phase Two, and finally EVs in Phase Three of the STEP docket.

Electric Vehicle Program Implementation and Time of Use Rate

Q: Are you offering additional testimony about the EV Incentive and Time of Use (TOU) rate in this phase of the proceeding even though the funding has already been approved by the Commission in Phase One of this docket?

A: Yes. The Commission approved the Company's requested annual $2 million to fund the program, beginning January 1, 2017, in Phase One of this docket. In Phase Three of the

[4] The Office of Consumer Services' Motion to Amend the Scheduling Order and Request for Scheduling Conference, In the Matter of the Application of Rocky Mountain Power to Implement Programs Authorized by the Sustainable Transportation and Energy Plan Act, 16-035-36, February 7, 2016.
[5] Phase Three Scheduling Order and Notice of Hearing, In the Matter of the Application of Rocky Mountain Power to Implement Programs Authorized by the Sustainable Transportation and Energy Plan Act, 16-035-36, February 27, 2017, p. 1.
[6] Id., at p. 2.

docket, the Company is seeking approval to implement the program as detailed in the Company’s supplemental application and accompanying TOU tariff sheets.[7] Section 54-20-103(1)(b) directs the Commission to authorize a program that promotes customer choice in EV charging equipment and TOU rates before July 1, 2017.[8]

Q: Has the Division participated in technical workshops and workgroups to discuss the aspects of the EV Incentive Program and TOU pricing?

A: Yes. There have been additional workshops and workgroups since the conclusion of Phase One in this docket covering topics such as the different technologies that can be used for the charging infrastructure and other program topics. However, the workgroup discussions were mainly centered on TOU rate design and other considerations, such as sample design, to ensure the program is in the public interest.

Q: Would you share the Division’s conclusions and recommendations?

A: In addition to the workshops, the Division has reviewed the Company’s application, pilot or program design, and proposed tariffs for the EV pilot program. While the Division supports the EV pilot, the Division has several concerns with the Company’s proposals, especially the two TOU rates. Therefore, at this time, the Division cannot recommend

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[7] Docket No. 16-035-36, Rocky Mountain Power’s, Supplemental Application to Implement Electric Vehicle Incentive and Time of Use Pricing Programs Authorized by the Sustainable Transportation and Energy Plan Act, January 31, 2017.

[8] See http://www.le.utah.gov/xcode/Title54/Chapter20/54-20-S103.html?v=C54-20-S103_2016051020160510.

that the Commission approve or adopt the Company's proposal in its entirety.

Q: Please explain your concerns with the Company's TOU rates.

A: One benefit of EV use and, thus, a reason for supporting EV charging, is the potential environmental benefit of reduced emissions through use of electric charging instead of fossil fuel emissions. However, EV charging potentially could add substantial load on the system. In fact, the more successful the EV program, the greater the additional load to power the EVs. If this load were to occur during peak hours, the Company may need to acquire additional resources to cover the higher coincident peak. Such acquisitions could offset the benefits of more fully utilizing existing generation during off peak times and add incremental costs that all customers would bear. Much of the workshop discussion among the Parties was designing rate structures that would encourage EV owners to charge their vehicles in (and potentially shift other consumption to) off peak periods.

The parties discussed several rate designs, including TOU demand charges, TOU rates with on and off peak differentials, tiered or block TOU rates with on and off peak differentials, and higher customer charges. While the parties did not reach a consensus on a rate design that would achieve the best outcome for the pilot study, the Company has proposed two TOU rate designs that were discussed by the Parties. The first TOU, Option 1, proposes a 3:1 ratio for on and off peak pricing; the second TOU, Option 2, proposes a 10:1 on and off peak ratio. The Division is concerned that:

a) The difference in the rate design, in concept, between the Company's Option 1 and Option 2 is not significant, meaning, the only difference is a higher ratio in the energy charge (3:1 for Option 1 and 10:1 for Option 2). The Division is concerned that the similarity in the two rate structures may prevent the Parties or the Commission from drawing definitive conclusions about customer behavior under each rate structure or between the two designs.

b) Since EV charging equipment allows the customer to program charging during specified intervals, higher on peak prices may induce customers to charge EVs during off-peak periods. However, while higher on-peak rates may incent customers to avoid charging their vehicles during on-peak periods, the price elasticity of demand[9] for electric consumption has historically been relatively low. In other words, the demand for electricity is typically not very responsive to price signals. While the 3:1 ratio may incent EV owners to charge in off-peak periods, the 3:1 ratio proposed under Option 1 by the Company may not be great enough to induce other behavioral changes.

[9] The ratio of the percentage change in the quantity demanded of a product or resource to the percentage change in its price; a measure of the responsiveness of buyers to a change in the price of a product or resource. McConnell, C.R. & Brue, S. L., (2002). Economics. McGraw-Hill. USA.

c) Option 2, with the 10:1 ratio, may provide a stronger price signal to charge EVs in off-peak periods but may be punitive if customers cannot significantly change their energy use in other areas.

In summary, of the two rate structures proposed by the Company, Option 1 appears to be better suited to encourage EV customers to charge their EVs in off-peak periods, without being overly punitive. An alternate structure could employ a more modest ratio than the Company's proposal of a 10:1 ratio under Option 2, say 4 or 5 to one. But the similarity to Option 1 may prevent drawing useful conclusions and distinctions between the two rates. However, the Division anticipates reviewing other parties' proposals and believes a useful proposal or hybrid proposal will be possible later in this proceeding.

The Division recognizes that designing rates requires balancing several, often opposing, objectives or principles. The Division also understands the complexity of designing TOU rates that meet the difficult criteria imposed by a program such as this. Rate design could encourage off-peak system charging while at the same time cause increases in customer bills due to on-peak usage in other areas of customer energy consumption. The Division is concerned that the recommended structures will not allow comprehensive analysis of EV charging behavior and its consequences, including whether the rates change customer behavior sufficiently.

Q: What if the TOU rates do not incent the EV customers enough to charge their EVs during off-peak times?

A: Considering the current and future penetration of EVs that will be relying on the grid to charge EVs, using any level of charging infrastructure at system peak load times could potentially accelerate the need for large capital investment in generation resources such as simple cycle combustion turbine (SCCT), combined cycle combustion turbine (CCCT), or wind, or require additional front office transactions (FOTs)[10] to meet demand caused by EV charging during peak times. This is contrary to the purpose of the STEP Program and a burden to all customers.

Q: Did the Division review tariff Schedule No. 120 and tariff Schedule No. 2E filed by the Company?

A: Yes. Along with its Supplemental Application, the Company filed tariff Schedule No. 120, Plug-In Electric Vehicle Incentive Pilot Program and tariff Schedule No. 2E, Residential Service – Electric Vehicle Time-of-Use Pilot Option.

Q: What was the result of the Division's review of those sheets?

A: The Division found that the tariff schedules adhere to Commission Rule 746-405-2. However, the parties never came to agreement on the rate design structure contained in Schedule No 2E.

[10] Depending on the amount of energy needed to support demand, FOTs may not be adequate and may be too capital intensive.

Pilot Program Load Study

Q: Does the Division agree with the load study design the Company is proposing as a result of the work group discussions?

A: Yes. The Division participated in the discussions designing the pilot and sample designs to gather as much useful information as possible. The Division understands that all the sample designs are in accordance with Public Utility Regulatory Policies Act (PURPA) standards and are expected to provide estimates of system peak demand that achieve, at a minimum, a level of precision of plus or minus 10 percent for a 90 percent confidence level.

The Company's proposal draws from approximately 2,000 current EV customers. Eligible customers will be selected and split into three groups denominated as follows: random assigned group (RAG), available to select group (ASG), and the Control Group. The RAG will have 40 to 60 customers assigned to TOU 1 and another 40 to 60 assigned to TOU 2. These customers will receive a $200 incentive for participating in the study and another $200 for participating in the TOU rates.

Table 1 (Random Assigned Group - RAG)

Rate	#Customers	Incentive Amount	Total Incentive
TOU 1	40-60	$ 400	$ 24,000
TOU 2	40-60	$ 400	$ 24,000
			$ 48,000

Those customers participating in the ASG can choose TOU 1 or TOU 2 on a first come first serve basis and receive a $200 incentive. The ASG customers will have the option to change to the other TOU rate after a period of one year.

Table 2 (Available to Select Group - ASG)

Rate	#Customers	Incentive Amount	Total Incentive
TOU 1 or TOU 2	200	$ 200	**$ 40,000**

The Control Group will consist of 40 to 60 EV customers currently on residential Schedule 1. These customers will receive a $200 incentive for participation.[11]

Table 3 (Control Group)

Rate	#Customers	Incentive Amount	Total Incentive
Res Sch. 1	40-60	$ 200	**$ 12,000**
		Total	**$ 100,000**

The Division agrees that the study should last at least 12-24 months to gain as much understanding of customer characteristics as possible, while allowing enough time for parties to analyze the data and make recommendations to the Commission within the five-year term of the pilot program. While the Division generally agrees that participating customers should be guaranteed that their bills will not exceed 110

[11] The TOU program allows for $200,000 for incentives with $100,000 reserved for outreach and awareness. Company witness William Comeau, Direct Testimony, at line 183.

percent of what they would be if not on the TOU rate, the Division is concerned that this may lead participants to not change behavior, or otherwise undermine the study.

The Division supports the proposed five-hour peak time window of 3:00 p.m. to 8:00 p.m. in the summer and winter months with an additional two hour window from 8:00 a.m. to 10:00 a.m. during the winter months. This will, according to the Company, likely capture a high percentage (94 percent)[12] of the actual coincident peaks.

Q: Will load research meters be needed for the load study and does the Company explain how the meter expense will be covered?

A: Not specifically. In Mr. Meredith's direct testimony,[13] he explains that for each participant on the EV TOU Pilot, a meter capable of measuring on-peak and off-peak energy would need to be installed at a cost of about $200 for labor and equipment. The Company requests that these meter costs be recovered through funds collected for the STEP program.

Q: How should meter expenses be handled?

A: The Division agrees with the Company that meter costs should be recovered through STEP funds. However, the Company's proposed accounting treatment of meter

[12] Company witness Robert M. Meredith, Direct Testimony, at line 237.
[13] Company witness Robert M. Meredith, Direct Testimony, lines 393-396.

expenses, customer incentives, and outreach, is not clear to the Division. The EV program is allowed $2 million dollars per year for five years. As previously explained, the cash for the incentive is accounted for between incentives and outreach. Therefore, the Division is not sure where the funding for the meters will come from.

If the meter expense cannot be covered with STEP EV funds, the Division proposes that the meter expenses come from the roughly $1 million approved by the Commission in Phase One set aside for additional Conservation, Efficiency and Other New Technology Programs.[14]

Q: Does the Division believe customers with roof-top solar should be allowed to participate in the study?

A: No. The purpose of the study is to determine how EV customers will use energy to charge their EVs and incent them to charge off-peak. It is unclear, as previously mentioned, how the study will discern EV customer behaviors, such as developing energy efficiency practices in other areas of their homes and energy use throughout the day. This means the load study will capture behavioral traits other than just EV charging. Allowing customers with roof-top solar, or other behind-the-meter distributed generation (DG) resources such as storage into the study will skew the intended results

[14] Docket No. 16-035-36, Rocky Mountain Power's, In the Matter of the Application of Rocky Mountain Power to Implement Programs Authorized by the Sustainable Transportation and Energy Plan Act, September 12, 2016, at page 4.

of the study. While roof-top solar customers might be ideal candidates for EVs and TOU rates, they are not well-suited to the study.

<u>Operating, Maintenance, Administrative, and General Expenses</u>

Q: Will there be any additional Operating, Maintenance, Administrative and General (OMAG) expenses that will be recovered outside of the STEP Program through customer rates for the EV Program in Phase Three of this docket? This was a concern identified in Phases One and Two of this docket.

A: It is unclear if there will be any additional OMAG expenses incurred by the Company as a result of the EV incentive program as proposed by the Company. These potential OMAG expenses are not fully known at this time and are purely speculative. The EV portion of the STEP program allows for a maximum of $2 million a year. The Division understands that the Company will seek recovery for any additional ongoing EV related OMAG expenses relating to the program after the pilot ends in a future general rate case.

Q: Would you recommend that the Commission require the Company to identify and report the OMAG expenses incurred by the EV Incentive Program in the same manner as recommended by the parties in Phase One and Phase Two of this proceeding?

A: Yes. In its Phase One Report and Order, the Commission directed the Company to include all program-related OMAG expenses in the STEP budgets.[15] The Commission found value in requiring the Company to track and report the OMAG expenses

[15] Report and Order, In the Matter of the Application of Rocky Mountain Power to Implement Programs Authorized by the Sustainable Transportation and Energy Plan Act, 16-035-36, December 29, 2016, pp. 6-8, and p. 16, item 7.

associated with the programs and that the Company should record them within the STEP budget and records so those expenses could be accounted for during the next general rate case.[16]

Q: Does the Division have any other concerns with respect to the STEP Program that have not been discussed in Phase One, Phase Two, or in this phase of the docket?

A: Yes. The Division participated in discussions with the Company and other stakeholders throughout all three phases of the STEP docket. The Division shared its concerns and offered comments for each of the programs during those discussions. Other than those concerns discussed in this testimony, the Division believes the workshops were helpful in narrowing down issues and finding agreement between the parties.

The Division, however, discovered a small discrepancy during its review of Exhibit RMM-5. Company witness Robert M. Meredith offers a comparison between the incremental cost to charge a Nissan Leaf and the cost to fuel an internal combustion engine (ICE) getting 36.4 mile per gallon in his Exhibit RMM-5.[17] The present TOU Schedule No. 2, and the proposed TOU 1, and proposed TOU 2 do not include various surcharges, including the energy balancing account (EBA), renewable energy credits (RECs), or Help adjustments. The calculations contain only the demand side management (DSM) and

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[16] Id, at p. 12.
[17] Company witness Robert M. Meredith, Exhibit RMM-5.

STEP adjustment. Adding these additional charges would slightly lower the savings over fueling with gasoline.

Q: Given your testimony in this phase of the proceeding, does the Division recommend that the Commission approve the implementation of the EV TOU Pilot Incentive Program to begin July 1, 2017?

A: Yes, with the exception of tariff Schedule No. 2E. The Division finds the Company's EV proposal in this phase of the docket to be in the public interest and recommends that the Commission approve the EV TOU Incentive Program and tariff Schedule No. 120 as outlined in Phase Three of this docket.

The Division has reviewed the Company's Application and Supplemental Application for implementation of the EV Incentive Program as contained in the Commission's Phase One Order and ensuing Phase Two and Phase Three Scheduling Orders in this docket.

The Division believes the Company should be granted approval of its Supplemental Application with the same accounting treatment and reporting as ordered by the Commission in Phase One of this docket, and tariff Schedule No. 120. However, Schedule No. 2E should not be approved in its current form. The Division will continue reviewing proposals and participating in discussions to arrive at a potentially better proposal. As stated previously, the Division recommends that the Company be held accountable to report its progress and actual expenditures on the EV Incentive Program, and the Division will audit and track all the STEP initiatives as proposed through all phases of this proceeding.

Conclusions and Recommendations

Q: Please summarize the Division's conclusions and recommendations.

A: The Division recommends the Commission approve the Company's Supplemental Application and allow it to implement the EV Incentive Program before July 1, 2017.

However, the Division recommends that the Commission's approval in this docket should contain certain conditions and requirements of the Company to provide proper and sufficient accounting and reporting requirements as previously described. These conditions must be adhered to for the pilot program to be a success. With those conditions, the Division recommends the Commission approve the implementation of the Company's EV infrastructure incentive program and accompanying tariff sheet Schedule No. 120 New Plug-in Electric Vehicle Pilot Program. Schedule No. 2E Electric Vehicle Time-of-Use Pilot Option should not be approved until the parties present a better proposal.

Q: Does this conclude your direct testimony?

A: Yes it does.