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Division of Public Utilities

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COMMENTS

To: Utah Public Service Commission

From: Utah Division of Public Utilities

Chris Parker, Director

Artie Powell, Energy Section Manager

Bob Davis, Utility Technical Consultant

Charles Peterson, Utility Technical Consultant

Date: May 14, 2019

Re: Comments and Recommendations, Docket No. 16-035-36, – In the Matter of the Application of Rocky Mountain Power to Implement Programs Authorized by the Sustainable Transportation and Energy Plan Act (“STEP”).

RECOMMENDATION (APPROVAL with RECOMMENDATIONS)

The Division of Public Utilities (“Division”) reviewed Rocky Mountain Power’s (“RMP”) Application seeking approval from the Utah Public Service Commission (“Commission”) to spend remaining STEP Program funds. Based on RMP’s filing, information provided during its April 2, 2019, technical conference, and responses to data requests provided by RMP, the Division recommends the Commission approve RMP’s application to spend roughly \$2 million for the Intermodal Hub Project, \$3.3 million for the Battery Demand Response Project, and \$16.5 million for the Advanced Resiliency Management System Project. The Division makes its recommendation conditioned on RMP agreeing to provide quarterly updates on the projects and to meet with the Division and other stakeholders to discuss an exit strategy for the STEP Program during quarter four of this year.

ISSUE

On March, 8, 2019, RMP filed its Application with the Commission seeking authorization to implement: (1) the Intermodal Hub Project; (2) the Battery Demand Response Project; and (3) the Advanced Resiliency Management System Project. On March 8, 2019, the Commission

issued an Action Request to the Division asking it to review the filing for compliance and make recommendations. The Commission asked the Division to report back by April 8, 2019. On March 13, 2019, the Commission gave its Notice of Scheduling Conference. On March 22, 2019, the Commission issued its Scheduling Order, Notice of Technical Conference, and Notice of Hearing. The Commission seeks comments from parties by May 14, 2019, reply comments by May 31, 2019, and set a hearing date for June 17, 2019. These are the Division's comments and recommendations.

BACKGROUND

The STEP program is an extensive five-year program consisting thus far of four phases and one instance of reallocations to previously authorized funds. For brevity, the full background of the docket will not be repeated.

RMP began implementing various STEP programs in phases beginning in 2017. In the fifth tranche, Phase Five, RMP is seeking authorization from the Commission to spend \$5,265,575 from the "Other Innovative Technology" monies consisting of \$1,995,575 to fund the Intermodal Hub Project and \$3,270,000 to fund the Battery Demand Response Project. Finally, RMP requests combining the remaining "USIP" and "Conservation and Efficiency Technology" monies to fund the \$16,520,000 ARMS project and remaining USIP incentive obligations.

On February 6, 2019, the Commission approved RMP's request to reallocate funds within the Clean Coal Technology Program and approve additional Innovative Utility funds for the Battery Storage and Solar Project. The adjustments, along with the proposed funds for this phase, leaves approximately \$1,395,860 of un-allocated funds, and an undefined amount of unspent USIP incentive funds of approximately \$2 million. The STEP Program, all projects combined, is projected to utilize \$48,029,283 of the \$50 million authorized over the five-year pilot period.¹

DISCUSSION

The Commission approved the \$50 million STEP Program in its December 29, 2016 Phase One Report and Order. Utah Code Annotated § 54-7-12.8 and § 54-20-101 promulgates the types of projects and use of authorized funds under the discretion of the Commission. The Commission

¹ Rocky Mountain Power, Docket No. 16-035-36, Application, March 8, 2019, Table 1 Updated STEP Funding Budget, pg. 4.

may review the expenditures made by a large-scale electric utility for a program described in Subsection (1) in order to determine if the large-scale electric utility made the expenditures prudently in accordance with the purpose of the program.²

RMP claims the proposed projects will provide valuable information that will help it manage system impacts as a result of electric vehicle (“EV”) charging infrastructure, self-sustained multi-family communities, and address reliability issues from distributed generation and outages. While the Division recognizes that RMP has an obligation to serve its customers, which includes researching innovative ways to serve its customers as demands and technologies change, certain aspects of the proposed projects, if presented as stand-alone projects outside of the STEP Program, may not be in the public interest. Specifically, the use of rate payer funds to the primary benefit of a single customer or entity without the offsetting knowledge and experience that will enhance RMP’s ability to meet changing customer demands and benefit all ratepayers in the future, would likely not be in the public interest.

Weighing the potential benefits for all customers as an outcome of RMP’s proposed projects versus the benefits to the single customer or entity, the Division concludes that the proposals marginally meet the public interest standard as explained further for each project.

Intermodal Hub Project

The essence of the Intermodal Hub Project is a significant research and design project in collaboration with Utah State University (“USU”) and the Utah Transit Authority (“UTA”) to develop and deploy algorithms along with hardware to utilize existing UTA infrastructure more efficiently. The project provides charging infrastructure for various types of EVs at UTA’s Salt Lake Central Station. UTA also expects a load factor improvement at its Salt Lake Central Station as a result of using its electric TRAX light-rail commuter line and other power equipment at the station more efficiently.³ RMP is requesting \$1,995,575 of STEP funds for this project.

RMP provides power to UTA’s Central Station through a single step-down transformer and then distributes power to various circuits at UTA’s Central Station. The power required to move the TRAX trains sets the demand charge and load factor at the station. This power arrives as AC and then is converted to DC through UTA’s equipment exclusively for the TRAX lines.

² https://le.utah.gov/xcode/Title54/Chapter20/54-20-S105.html?v=C54-20-S105_2016051020160510 at ¶ (2).

³ RMP responses to DPU Data Request 10.10 and 10.11.

The system experiences a large 3-5 second energy spike when a train pulls away from the station. These spikes occur approximately every 15-minutes in conjunction with the TRAX schedule. The primary goal of the project is to develop and deploy algorithms that will work in conjunction with the train schedule to charge busses and other EVs during the non-spike time of energy use. The TRAX trains will have priority while the EV charging for electric busses and other vehicles takes place between the spikes dependent upon the algorithms.

The Division is concerned this project may only marginally be in the public interest because ratepayer funds are being used to the primary benefit of one customer offset by experience and information that might benefit all customers in the future. Funds provided by other ratepayers might lower the power bill of UTA by improving its load factor as a result of the EV charging technology.⁴ In addition, this project uses ratepayer funds to purchase chargers that might generate revenues for UTA through fees charged to interstate and urban passenger car and truck traffic. If successful, UTA may explore utilizing its system to create more EV charging locations across its other approximate fifty TRAX substations.

It is not obvious that algorithms can be developed and deployed that will successfully coordinate the charging of busses, interstate and urban passenger car and truck traffic, and other charging applications as stated in Mr. Campbell's testimony, while keeping the TRAX trains on schedule. However, if the project is successful, the load factor at the station will improve as a result of the technology making the distribution grid more efficient, thus potentially lowering costs to all customers. The project provides RMP distribution engineers with valuable knowledge regarding power balancing, demand response, and a better understanding of high-power multi-modal vehicle charging settings so that it can provide solutions to its other customers' EV charging infrastructure power management needs as the grid becomes more progressive.

The Division concludes the growing demand for EV transportation infrastructure requires a better understanding of how the demands of charging infrastructure impacts the utility's infrastructure. This includes researching ways to develop infrastructure without having to significantly increase its size and costs to meet the peak demand requirements of EV charging

⁴ Load factor is defined as Average Load divided by Peak Load.

infrastructure. As RMP modernizes its grid, understanding power balancing and demand response is key to utilizing the system efficiently.

In response to DPU Data Request 12.1 regarding the load factor concerns, RMP explains the Salt Lake Central station has eight meters feeding multiple circuits. The circuits feed the TRAX lines, office space, bus garage, parking lights, and de-icing equipment. On average, the typical TRAX train station experiences roughly 1 MW of demand, or two-percent of the entire UTA system of fifty substations.⁵ The Division concludes that the percentage of load factor for this single station compared to UTA's other substations along the TRAX lines is insignificant and the benefits of the gained knowledge to RMP's personnel outweigh the potential benefits to UTA.

In response to DPU Data Request 14.1, RMP confirms that it will be co-owner of the software copyrights created by Utah State University. It is uncertain at this time if UTA plans to develop EV charging at its other TRAX substations or sell the software to other entities. Should UTA, or others, use the technology, RMP's customers will likely see some benefit as a result of the copyright agreement.

The Division recommends the Commission approve the Intermodal Hub Project. The Division concludes the project is calculated to provide valuable data and learning opportunities to all stakeholders as EV charging infrastructure is developed to meet growing EV transportation needs. The Division recommends the Commission direct RMP to have quarterly updates on the Intermodal Hub Project throughout the remainder of the STEP Program to keep interested parties current on its progress including all accounting associated with the project.

Battery Demand Response Project

The Battery Demand Response Project provides an opportunity to study how a complex, behind-the-meter ("BTM") multi-family community, solar and storage system, might interact with the distribution grid under different scenarios. RMP is requesting \$3,270,000 of STEP funds for this project.

The \$3,270,000 of requested funds will be used to augment the purchase of Sonnen batteries in conjunction with funds provided by Wasatch (\$3,270,000 of the estimated \$12

⁵ RMP response to DPU Data Request 12.1.

million in battery costs). In return, RMP claims it will have access to information over the twenty-year life of the project. This information includes BTM demand response, load shaping, billing and rate design, reliability, back-up power, and micro-grid applications. The project seems reasonable in intent and an opportunity for RMP personnel to gain valuable knowledge. However, the design expectations raise a question to its validity for several reasons.

The Division's understanding is that there will be 5.2 MW of on-site solar providing energy to charge 621 - 8 kW batteries, which in combination can provide seventy-five percent of the energy needs to 600 units, an estimated 104 EV chargers, other ancillary buildings, and common areas. At the same time, the batteries might be used to provide demand response as needed by RMP. The Division does not have the expertise to fully determine the feasibility of the design, but given the efficiencies of solar and unknown characteristics of the batteries, it seems like a tall order even with the energy efficient design of the apartments. It is unclear to the Division the quantity and quality of information RMP personnel will actually glean from this project.

The Division initially had concerns that this project is similar in scope to the Panguitch Solar plus Storage Project (STEP Phase One) and is unneeded in acquiring the stated operational information. In response to DPU Data Request 10.28, RMP explains the difference between this project and the Panguitch Solar plus Storage Project is that Panguitch focuses on solving voltage constraints on the transmission system by installing a solar and battery system on the downstream distribution system. The Battery Demand Response project will provide BTM opportunities, such as daily load shaping, customer demand response, and data to inform rates for customers with batteries.⁶

During the Technical Conference held on April 2, 2019, RMP told those in attendance that most of the data and learning opportunity would occur as the rental units are tested under different scenarios before being offered to renters. The Division's understanding is that limited information will be gleaned once the units become occupied over the twenty-year period. Each unit will, however, have a bi-directional meter, meaning that RMP may see some usage patterns

⁶ Id., 10.28.

from the meter similar to Schedule 136⁷ Customer Generation customers. The units gather most of their energy from the solar panels, batteries, or both. However, there may be times when the grid supports each unit's needs or export surplus energy to the grid when available. Export and delivery information on a solar plus storage customer may potentially be beneficial in the future for rate design purposes. There are no other meters planned for the community to provide data to RMP for demand response, load shaping, or reliability data as a stand-alone load. RMP explained to the group that should the grid go down, the Soleil complex will go into "island mode" and completely disconnect from the utility for safety reasons. The Division understands the complex may act in the capacity of a micro grid and support the grid during such an event in the future as technology permits. However, at the present time, the project is designed to supply energy to the 600 units and ancillary EV chargers and buildings, not support the grid.

The demand response attributes of the project are uncertain. RMP will have control over the individual 621 batteries through software developed by Sonnen. Similar to the Cool Keeper Program, RMP would utilize the batteries to support grid reliability when needed. RMP explained to the group that the demand response control of the batteries would be part of the renter's agreement giving it full access as needed. However, RMP has not determined how it will utilize the batteries at this time.

The Division is concerned this project may only marginally meet the public interest for two reasons. First, STEP funds will purchase batteries to make the project economic for Wasatch. Otherwise without the STEP funds, Wasatch would not proceed with the battery portion of the project.⁸ Second, the information RMP personnel might glean from the project does not seem robust, and is likely to be sporadic over the twenty-year period. However, the goal of the STEP Program is to research and gather useful data through projects such as this so RMP can provide better service and reliability in the future. With the anticipation of more and more types of communities like the Soleil project in the future, the Division deems it important for RMP personnel, and others, to gain knowledge of such technologies and how that knowledge might be used to improve the system.

⁷ Schedule 136 customers are solar export credit solar customer generation customers with BTM solar and some storage.

⁸ Direct Testimony of William J. Comeau, Docket No. 16-035-36, March 8, 2019, lines 74-75.

The Division recommends the Commission approve the Battery Demand Response Project conditioned upon proof of Herriman City's approval for lithium iron phosphate batteries within living areas. In the event the batteries cause problems, the Division recommends the Commission direct RMP to provide assurance that it and ratepayers are protected from subsequent legal action. The Division recommends the Commission direct RMP to have quarterly updates of the Battery Demand Response Project throughout the remainder of the STEP Program to keep interested parties current on its progress, including all accounting associated with the project.

Advanced Resiliency Management System Project – ARMS

The proposed budget for this project is \$16,520,000. The project has two parts: (1) a proposal to modify current automated meter reading ("AMR") meters to provide data similar to advanced metering infrastructure ("AMI") meters through software upgrades; and (2) deploy a communication mesh network and line sensors. The proposed cost to develop and deploy the AMR system is \$11,290,000. The cost to develop and deploy the Communication based Fault Circuit Indicator ("CFCI") and Encoder Receiver Transmitter ("ERT") Gateway network is \$5,230,000.

The predominant portion of the \$11,290,000 is the development costs of the software that enables AMR meters to provide AMI meter quality data. The Division's understanding is that Itron maintains the copyrights to the software and can sell it to its other customers.⁹ The estimated \$11.3 million also includes the deployment of the technology on RMP's existing AMR meter infrastructure.

The use of STEP funds to develop software that can be sold to Itron's other customers would not typically be in the public interest. However, the Division is concerned with RMP's slow deployment of more advanced AMI meter infrastructure necessary to better understand distributed generation impacts to its system, system reliability, and the ability to design reasonable rates. At the same time, the Division is concerned that monies already spent to deploy AMR meter infrastructure may become stranded costs if replaced by AMI meter technology in the near future. In response to DPU Data Request 13.2, RMP explains that the average useful life

⁹ RMP response to DPU Data Request 10.41.

of its AMR meters is twenty-plus years and the average age of currently installed AMR meters in Utah is almost 10-years.¹⁰ In response to DPU Data Request 10.39, RMP estimates that it would cost approximately \$147 million to replace the AMR meters with AMI meters.¹¹ With the current AMR meters at roughly half-life and the cost to replace them with AMI meters, the Division concludes that this portion of the project benefits all ratepayers by providing a near-term software solution to its AMI deployment concerns by expanding AMR capabilities to reasonably emulate the capabilities of AMI technology. An additional benefit of this software upgrade helps customers understand their usage patterns by offering next-day interval meter data.

The Division's review of the ERT Gateway network development, line sensors, and CFCI deployment, seems reasonable and in the public interest. The creation of the communication network throughout the State,¹² line sensors, and CFCIs, will improve RMP's ability to maintain its system by providing reliable power through improved Sustained Average Interruption Duration Index ("SAIDI") and Customer Average Interruption Duration Index ("CAIDI") times, and provide valuable data as more distributed generation is added to the system.

The Division recommends the Commission approve the ARMS Project. The Division recommends the Commission direct RMP to have quarterly updates of the ARMS Project throughout the remainder of the STEP Program to keep interested parties current on its progress including all accounting associated with the project.

Exit Strategy for the STEP Program

The Division recommends the Commission direct RMP to meet with the Division and other stakeholders during quarter four of this year to discuss how to end the STEP Program. Among other topics, the parties should discuss how the approximate \$1.4 million of un-allocated funds and un-used USIP incentive funds should be used as the STEP Program closes out in 2021, and early 2022 for the EV Program.¹³ The Division recommends that the Commission direct RMP to

¹⁰ Id., 13.2.

¹¹ Id., 10.39.

¹² Id., 10.37.

¹³ The EV Program runs from October 1 to September 30 in any play year to capture committed incentives not delivered.

provide an explanation of how it plans to account for projects that will continue after the STEP Program closes out.

CONCLUSION

RMP is seeking Commission approval to spend remaining STEP Program funds. Based on the foregoing discussion, the Division recommends the Commission approve RMP's request with the Division's recommendations and conditions discussed above: (1) the Intermodal Hub Project; (2) the Battery Demand Response Project; and (3) the Advanced Resiliency Management System Project. The Division recommends the Commission direct RMP to meet with interested parties quarterly throughout the remainder of the STEP Program to update those interested on the progress of the Projects. The Division recommends the Commission direct RMP to meet with the Division during the fourth quarter of this year to discuss the exit strategy for the STEP Program.

cc: Joelle Steward, RMP
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Service List