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DEPARTMENT OF COMMERCE
Office of Consumer Services

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To: Utah Public Service Commission

From: Office of Consumer Services
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Date: May 14, 2019

Re: 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).

Introduction

In March of 2016, the Utah Legislature passed and the Governor signed into law the Sustainable Transportation and Energy Plan Act (STEP).¹ The STEP Act allows the Company to implement qualifying programs, approved by the Commission, during a five-year pilot program period.

On March 8, 2019, Rocky Mountain Power (RMP or Company) filed with the Public Service Commission (Commission), an application to authorize the approval of three new programs under the Sustainable Transportation and Energy Plan Act (STEP). The Company seeks Commission authorization for:

1. the Power Balance and Demand Response to Optimize Charging at Intermodal Hub Project (intermodal hub project);
2. the Wasatch Development Partnership Project for Battery Demand Response (battery demand response project); and
3. the Advanced Resiliency Management System Project (ARMS project).

¹ To read the STEP Act, see: https://le.utah.gov/xcode/Title54/Chapter20/54-20.html?v=C54-20_2016051020160510

On March 22, 2019, the Commission issued a Scheduling Order, Notice of Technical Conference, and Notice of Hearing. This notice established Tuesday, May 14, 2019 and Friday, May 31, 2019 as the deadlines for interested parties to submit comments and reply comments, respectively. The Office of Consumer Services (Office) submits the following comments in accordance with the Commission’s established schedule.

The Intermodal Hub Project

The proposed Intermodal Hub Project is described by the Company as “a comprehensive research, development and public demonstration project that will serve as a model for deployment of efficient large-scale, multi modal charging centers consisting of common grid and charging infrastructure with managed power load balancing and operating costs through demand response software and hardware strategies. A primary objective of this project is to develop tools that can avoid oversizing infrastructure equipment by optimizing system design.”² The Company seeks Commission approval to allocate \$1,995,576 of STEP funding over three years for the Intermodal Hub Project.

The proposed approach combines the electric needs of a light rail system, electric buses, interstate and urban passenger and truck traffic, park-and-ride customers, and first-and-last mile ride hailing and car share serve providers – all at a single site. The Intermodal Hub is centrally located with a diverse range of vehicles operating at or near the Hub making it a suitable site for the Intermodal Hub Project.

The Intermodal Hub Project is a site-level energy management system through which the Company expects to develop control system tools, increase utilization of charging equipment, evaluate the potential for a utility demand response program and conduct a cost benefit evaluation.

The proposed Power Balance and Demand Response Intermodal Hub, and associated research components will be used to manage power flow between the grid and various electric vehicle (EV) charging needs. “The project will leverage a data-driven methodology for forecasting charging demand and expand to consider scheduled routes and demands for TRAX light rail, electric bus route schedules, and vehicle-to-infrastructure communication to inform the Intermodal Hub energy management system of anticipated demands.”³

In this filing, the Company does not provide a cost benefit analysis of the proposed Intermodal Hub Project, nor does the enacting legislation require such an analysis for Commission approval. However, the Office believes that the Commission should require the Company to provide a cost benefit analysis at the conclusion of the Intermodal Hub Project as will be further explained later.

² Direct testimony of James A. Campbell, lines 104-109.

³ Direct testimony of James A. Campbell, lines 43 – 47.

The Company states that the project will be managed to mitigate project risks and that appropriate risk mitigation measures will be identified and resolved in the project development phase, with appropriate timeframes for resolution. The Office believes that even with appropriate planning with a project of this nature circumstances may arise that may impede progress on the project. The Office recommends that the Commission require the Company to report on any elements of the project that are not resolved within the “appropriate timeframes” specified.

Goals of the Intermodal Hub Project

The primary goals of the Intermodal Hub Project are to reduce peak loads and increase utilization of charging equipment. The Company proposes to use “controls, demand management, and intelligent scheduling to limit peak demand while maintaining high quality service.”⁴ The Company believes that this will minimize infrastructure upgrade and operating costs at the site as well as some upstream transmission and distribution equipment costs.

The objectives for the Intermodal Hub Project, as stated by the Company, are to “develop best practices for new technology function and deployment and to evaluate the merit of the technology’s application.”⁵

In its response to DPU data request 10.11 the Company states: “it is expected that the proven benefits from the technology on this pilot project will show that the technology can pay for itself through infrastructure and demand charge cost savings and will catalyze broader deployment of EV charging stations in Utah.” The only way that the Company’s assertion can be demonstrated is through a comprehensive cost-benefit study that evaluated all costs and benefits at the end of the pilot. The Office recommends that the Commission require such a study.

Partners in the Intermodal Hub Project

The Company proposes to partner with Utah State University’s Sustainable Electrified Transportation Center (SELECT), and the Utah Transit Authority (UTA) to develop software for a power balance and demand response control system. The software will be developed at SELECT’s Electric Vehicle Roadway (EVR) research facility and test track and deployed at the UTA’s Salt Lake City Intermodal Hub for data collection and a demonstration of sustainable electrified transportation technology. The software will manage “multi-modal vehicle charging at sites with high peak demand” by optimizing the system design through increased utilization of charging equipment and reducing peak loads.

At the completion of the project, all equipment associated with the project installed at the USU EVR will be owned and operated by USU, and the equipment installed at the SLC UTA Intermodal Hub will be owned and operated by UTA. The Company states it will retain the right to access, participate in, and/or propose follow up projects involving the

⁴ Direct testimony of James A. Campbell, lines 59 – 60.

⁵ Exhibit RMP___(JAC-1) page 2 of 12.

equipment. Utah State University and Rocky Mountain Power will jointly own the software that will be developed for the Intermodal Hub Project.⁶

Projected Growth in Electric Vehicles

According to the Company there are currently 9,068 electric vehicles registered in Utah⁷ and the electric vehicle market continues to increase. EV charging infrastructure is predicted to be an impediment to the advancement of vehicle electrification. The Intermodal Hub Project will enable EV adoption by providing low cost solutions to charging infrastructure expansion.

Potential Future Applications of the Technology

If the technology developed through the Intermodal Hub Project is successful, the Company asserts that the potential exists for future applications. For example in the April 2, 2019 technical conference, the Company identified the following opportunities for future deployment of the technology:

- UTA study identified 70 potential charging locations
- 50 light rail substation upgrades are needed
- Other transit possibilities
 - Park City
 - Zion National Park
 - Airport
- Truck and distribution centers
- Other industries
- Company and USU will hold outreach and workshops to share findings⁸

The Office believes that with the expected increase in electric vehicles of all types e.g., cars, trucks, buses, transport vehicles, etc., finding ways to decrease the expense of upgrades to substations, distribution centers, etc. and to better utilize the infrastructure by optimizing charging should be beneficial to all customers. If the technology is effective, it could also provide opportunities for faster deployment and adoption of electric vehicles. Thus, helping to reduce tailpipe emissions and improve air quality on the Wasatch Front.

The Office recommends that the Commission approve the Intermodal Hub Project subject to the conditions outlined in our recommendation section below.

Battery Demand Response Project

The Company has proposed that \$3.27 million of STEP funding be allocated to a new project which will allow the Company to have access to and control of a third party's behind-

⁶ Company response to OCS data request 27.3.

⁷ Company response to DPU data request 12.2.

⁸ April 2, 2019 technical workshop handout, page 20.

the-meter integrated solar-battery system. The Company plans to study how the integrated system operates and use the battery system for demand response purposes similar to the current Cool Keeper program. The Company will gain control of the solar-battery system by entering into a contract with Wasatch Development, a real estate development company, who will own the solar-battery system. Dedicated sets of photovoltaic solar panels and one 8 kW lithium iron phosphate battery will be connected to each apartment in the 600 unit Soleil apartment complex which is currently being constructed by Wasatch Development in Herriman, Utah. Common area buildings will house an additional 21 solar/battery systems for a total of 621 batteries for the entire complex. In aggregate, the system will consist of approximately 5.2 MW of solar panels and 5 MW of batteries. The batteries provide up to 12.5 MWh of stored electrical power. The apartment complex is expected to be completed by December 2020.

The Company indicates that it has three primary outcomes for the project:⁹

1. Use the system for demand response by discharging excess battery capacity into the grid during peak load conditions on the grid.
2. Understand how solar/battery systems change load shapes. The solar/battery system will change the timing and duration of the apartment complex's peak loads.
3. Inform the development of a future rate design for customers with behind-the-meter batteries.

In addition to these three outcomes, the Company also believes the project will enable it to study the effects on the distribution system of these types of systems, learn how batteries can balance the intermittency of solar panels (especially in the area of frequency response)¹⁰ and gain knowledge for future large scale deployments of battery storage systems on the distribution system.

If the Company were to fund the acquisition of the entire solar/battery system, the cost would be approximately \$34 million - \$22 million for the solar panel system and \$12 million for the batteries.¹¹ The Company proposes to provide Wasatch Development \$2.5 million of STEP funds toward the purchase of the battery system in return for control of the system for 25 years. Wasatch Development has indicated that without the STEP subsidy (and the available investment tax credits), it would not add batteries to the solar panel system at the Soleil apartment complex. The Company states that this project is in the public interest because by partnering with Wasatch Development, the Company will be able to test the feasibility and economic benefit of battery demand response and study the behavior of a solar/battery system for a fraction of what it would cost if the Company owned the system.

The remaining \$770,000 (\$3.27 million minus \$2.5 million) of the STEP funds for this project would be spent on software, data analysis and systems customization to allow the solar/battery system to integrate with the Company's systems. In addition, the project is

⁹ Page 3 of the Direct Testimony of William J. Comeau and pages 2 – 3 of Exhibit WJC-1.

¹⁰ Page 12 of April 2, 2019 Technical Conference Presentation.

¹¹ Pages 4 and 6 of Exhibit WJC-1.

forecasted to require ongoing expenses of \$51,000 per year over the life of the project for battery software and project administration costs.¹²

The Office believes that the proposed Battery Demand Response Projects meets the requirements of the STEP legislation – falling under Section 54-20-105(c), an Innovative Utility Program that provides for the “investigation, analysis, and implementation of a battery storage or electric grid related project”. The Office agrees with the Company that the proposed project is a cost effective way for the Company to study a large behind-the-meter solar/battery system and the Office recommends that the Commission approve the project.

The Office is concerned that this is another STEP project that will have ongoing annual costs after the STEP program sunsets on January 1, 2022. The Office recommends that the Commission require the Company to report annually and at the time a new STEP project is proposed the aggregate total of ongoing OMAG for all existing and proposed STEP projects by year for the remaining lives of the projects.

Advanced Resiliency Management System (ARMS) Project

RMP is seeking Commission approval to allocate \$16.52 million in STEP funding towards the newly proposed ARMS project. The Company describes the ARMS project as “an advanced outage management system” composed of advanced electric meters and distribution line sensors that relay operational data back to the Company’s control center. RMP claims the data received through the technology of this new program will allow the Company to detect electricity outages and identify the outage location more quickly – both at end user meters and on targeted distribution lines. The Company also says it will study the outcomes of this project in order to further improve and modernize the grid.

Deployment of Advanced Electronic Meters

RMP’s application describes that the Company plans to upgrade its existing electric meter system – without replacing most of the hardware. Specifically, while the Company explains that the vast majority of its customer meters are Automated Meter Reading (AMR) meters, from which RMP employees collect data wirelessly by way of vehicle-mounted Encoder Receiver Transmitter (ERT) technology¹³, the system can be improved with targeted deployment of newer and more capable smart meters – called Advanced Metering Infrastructure (AMI) meters. The Company explains that a relatively smaller number of AMI meters (138,000) can be selectively deployed creating an “ERT gateway mesh network” capable of communicating with existing AMR meters and wirelessly sending all customer usage data directly back to RMP’s control center. The remaining 764,000 already-deployed AMR meters would not need to be replaced as part of this project. RMP estimates the cost

¹² Total project OMAG from response to DPU Data Request 10.26. In response to DPU 10.31, the Company stated that OMAG was included in the solar-battery \$3.27 million STEP budget through the end of 2021.

¹³ Encoder receiver transmitter (ERT) technology allows manual human meter reading to be replaced by an individual in a vehicle equipped with a computer and radio receiver that collects the data wirelessly within a short range of the vehicle. This system typically reads a customer’s meter once per month.

of deploying the hardware and the cost of developing the ERT gateway network software to be \$11,290,000.

The Company claims that the addition of these of AMI meters to the system will shorten the reporting and response time for service outages addressed by the control center. In addition, it would allow all customers' usage information to be collected daily, instead of monthly, and reported back to customers within 24 hours – allowing customers to make more informed electricity usage decisions. Lastly, RMP says these upgrades will also allow the Company to better detect meter tampering, will reduce the need of employees to visit customer properties, and will reduce CO2 emissions by having fewer Company vehicles on the road collecting meter data.

Deployment of Distribution Line Sensors and Radios

RMP explains that the other aspect of the ARMS project includes deployment of targeted distribution line sensor technology and communication radios. The line sensor technology, called communication-based faulted circuit indicators (CFCI), will allow the Company to more quickly identify and address outages across its distribution system. At this time, RMP plans to only install this technology on lines serving what it calls “critical customers” – hospitals, trauma centers, police and fire dispatch centers, etc. In addition to the CFCIs, the Company also plans to deploy communication radios on existing line equipment to automatically report problems directly to the control center and allow certain functions to be controlled remotely. RMP estimates the cost to deploy this technology is \$5,230,000.

The Company says focusing the deployment of this technology only on lines serving critical customers will allow RMP to study the potential and outcomes of the technology with a minimal initial investment. The Company also states that this technology will allow line crews to more quickly locate and repair outage issues without needing to investigate entire circuits.

Discussion by Interested Parties

While the Office had a few general concerns regarding the ARMS project, RMP's answers to questions asked either by the Office or other interested parties to the docket have resolved those concerns at this time. A few of those questions and answers will be recounted in this section as presented at the April 2, 2019 Technical Conference. Generally, the Office views this as a practical project and understands the potential benefits for Utah's growing electric utility customer base.

The Office questioned if the Company has a contingency plan for if the AMI meter manufacturer is unable to successfully develop new software for the proposed ERT gateway network. RMP responded during the technical conference that contract terms with the manufacturer will provide the Company with liquidated damages if the manufacturer is unable to provide the deliverables under the contract. The Office is satisfied with this response at this time.

The Office questioned what size service territory the ARMS project will impact. RMP responded that while the line sensors and radios will only be deployed for a small group of critical customers at this time, the ERT gateway network will impact all customers in Utah. The Division of Public Utilities (DPU) submitted a formal data request to the Company regarding this same question. RPM's response to DPU Data Request 10.37 also confirms this answer. As previously stated, the Company plans a limited deployment of the line sensor technology and radios in order to further study project outcomes from a minimal initial investment. The Office is satisfied with this response at this time.

Western Resource Advocates questioned why the Company was planning to only install a smaller number of AMI smart meters to complement the current AMR meter system instead of replacing all AMR meters with AMI meters. RMP's response at the technical conference explained this to be a financially conservative decision. The Company said that AMI meters cost \$193 each and if the Company were to replace the estimated 764,000 AMR meters at this time, the total cost would be over \$147 Million. That would result in a 790 percent increase to the cost of the ARMS project. DPU submitted a formal data request to the Company regarding this same question. RMP's response to DPU Data Request 10.39 also confirms this answer. The Office supports RMP's decision to enhance the functionality of existing AMR meters through the proposed ARMS project activities instead of full conversion to AMI meters. The Office emphasizes that any future AMI rollout beyond that explained in the ARMS project proposal should be pursued only if the benefits have been demonstrated to outweigh the costs.

Recommendations

The Office recommends that the Commission:

- Approve all three proposed projects.
- Require the Company to specifically report on the total and individual ongoing OMAG costs from all STEP projects both in its annual report and in each subsequent request for a new project.
- Require the Company to provide a cost benefit analysis at the conclusion of the Intermodal Hub Project.
- Require the Company to report on any elements of the Intermodal Hub Project that are not resolved within the "appropriate timeframes" specified.