UTAH PUBLIC SERVICE COMMISSION
Heber M. Wells Building
160 East 300 South, 4th Floor
Salt Lake City, Utah 84111

To: Utah Public Service Commission

From: Utah Clean Energy
Kate Bowman, Renewable Energy Program Manager

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 Act

Dear Public Service Commission,

On March 8, 2019, Rocky Mountain Power (The Company) filed an Application to Implement Innovative Utility Programs Authorized by the Sustainable Transportation and Energy Plan Act (Application), asking the Public Service Commission (Commission) for authorization to spend a total of $21.8 million STEP funds on three proposed projects: the Intermodal Hub Project, the Battery Demand Response Project, and the Advanced Resiliency Management System (ARMS). In a March 22, 2019 Scheduling Order the Commission noticed an April 2 technical conference and invited interested parties to submit comments on the Company's Application on or before May 14, 2019 and reply comments on or before May 31, 2019. Utah Clean Energy appreciates the opportunity to provide the following comments on the proposed programs.

We appreciate the Company's efforts to improve grid resiliency and flexibility through the development of these three proposed STEP programs. Utah Clean Energy recommends approval of the Company's proposed Intermodal Hub Project and the Battery Demand Response Project. These projects will help to accelerate the integration of additional clean energy technologies, including solar, battery storage, electric vehicles, and grid-scale renewable resources into the grid and are aligned with the goals of the STEP program. Although we support the Company's proposed Advanced Resiliency Management System, given the large anticipated net customer benefits resulting this from project we suggest that the ARMS project is more appropriately funded through general rates.

Intermodal Hub Project.

Through this Application the Company requests authorization of $1,995,576 in STEP funds for the Intermodal Hub Project as an "innovative utility program" pursuant to U.C.A. 54-20-105(1)(h). Utah Clean Energy supports the Company's application for this Project.

The Intermodal Hub Project is designed to demonstrate the viability of strategies for reducing the cost of infrastructure used to serve high wattage electric vehicle chargers through a pilot project at the UTA Intermodal Hub. Power consumption and demand associated with electric vehicle charging is growing. Fast chargers, including 50 and 150 kW DC fast chargers, are now commonplace, and 450 kW bus chargers have been deployed in Park City and will soon be in use at the UTA intermodal hub. Even more powerful chargers for a variety of vehicle types are under development: a research group in Germany has prototyped a 450 kW charger for vehicles of all types that can provide 100 km of range in three minutes, and Tesla's semi-truck relies on a 1.6

MW "megacharger."[1] Absent a plan for managed vehicle charging, the electrification of the transportation sector has the potential to significantly increase peak demand for electricity.[2] This could result in increased costs due to infrastructure buildout needed to support new electric vehicle charging sites. The high cost of electric vehicle infrastructure could also slow the adoption of electric vehicles of all types.

The Intermodal Hub Project will allow the Company to address this potential problem by demonstrating that managed electric vehicle charging can reduce costs associated with installation and operation of high powered electric vehicle chargers. UTA plans to have 50 electric buses in use at the Intermodal Hub, in addition to six 450 kW overhead chargers and 15 150 kW chargers.[3] Other customers in Utah have expressed interest in electric bus fleets, including the UTA depots in Ogden and Orem, the Salt Lake City Airport, and Zion National Park.[4] Park City has already implemented electric buses and intends to expand their electric bus service. The tools and lessons that result from this project can be used to reduce costs and improve electric vehicle infrastructure at other UTA and customer sites, including 50 sites where UTA is evaluating upgrades to electrical substations to support existing TRAX light rails.[5]

[1] BMW Group. May 12, 2018. Research project "FastCharge": ultra-fast charging technology ready for the electrically powered vehicles of the future [Press Release], found at https://www.press.bmwgroup.com/global/article/detail/T0288583EN/research-project-%E2%80%9Cfastcharge%E2%80%9D:-ultra-fast-charging-technology-ready-for-the-electrically-powered-vehicles-of-the-future.

[2] Mai, Trieu, Paige Jadun, Jeffrey Logan, Colin McMillan, Matteo Muratori, Daniel Steinberg, Laura Vimmerstedt, Ryan Jones, Benjamin Haley, and Brent Nelson. 2018. Electrification Futures Study: Scenarios of Electric Technology Adoption and Power Consumption for the United States. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20-71500. https://www.nrel.gov/docs/fy18osti/71500.pdf.

[3] Docket No. 16-035-36, RMP Response to WRA Data Request 5.3, April 8 2019.

[4] Docket No. 16-035-36, RMP Response to DPU Data Request 10.20, May 27 2019.

[5] Docket No. 16-035-36, RMP Response to DPU Data Request 10.20, May 27 2019.

The purpose of the Intermodal Hub Project, as described by the Company, is to develop a Power Balance and Demand Response system that is capable of forecasting and managing charging demand. As stated by the Company, a traditional approach to this project is "to evaluate worst-case conditions and require costly reconductoring and transformer and meter upgrades for each addition of charging equipment."[6] The pilot project at the Intermodal Hub is intended to demonstrate that by intelligently managing a diverse array of electric loads, including the new electric bus chargers, the Company can level peak demand on the grid. According to the Company, "this proposal introduces the innovative concept of combining the vast diversity of needs at an intermodal transit center to create multi-megawatt co-located, coordinated, and managed charging systems that guarantee through controls that worst-case analysis and costing is not required."[7]

TRAX sites are good candidates for managed electric vehicle chargers because they have high peak and low average power demand. Electric infrastructure is built to serve the needs of the TRAX train when it passes through the station, but is not well used in the interim. The UTA Intermodal Hub project represents an opportunity to demonstrate the value of using existing infrastructure to meet future needs, rather than overbuilding infrastructure that is ultimately not well used. By demonstrating that it is not necessary to oversize infrastructure in order to provide reliable service to a customer like the UTA Intermodal Hub, the Company can reduce the cost of future infrastructure investments. As a pilot project, the Intermodal Hub Project will not result in direct economic benefits at the site but will enable development of technology that can be used to

[6] Docket No. 16-035-36, Application to Implement Programs Authorized by the Sustainable Transportation and Energy Act, March 8 2019. Page 20.
[7] Docket No. 16-035-36, Application to Implement Programs Authorized by the Sustainable Transportation and Energy Act, March 8 2019. Page 20.

justify lower infrastructure costs in the future, as explained by the Company in response to DPU Data Request 10.8.

Managed charging will also reduce operating costs for the Utah Transit Authority (UTA). Managed charging can be used to ensure that every charger is used as frequently as possible, and that chargers do not sit idle during times when peak usage at the Intermodal Hub is low. This allows the UTA to install fewer chargers and to save money on electricity costs. Given that the UTA will incur a 400 kilowatt demand charge for each charger, it is more economically efficient to use the chargers as often as possible rather than installing additional chargers that each incur a demand charge but frequently sit idle. The lessons learned through this pilot project can be applied to help other customers who deploy electric vehicle charging infrastructure to do so with lower operating costs.

The Intermodal Hub Project will advance the conversion of public transit fleets to electric vehicles at lower costs, which is necessary to reduce air pollution along the Wasatch Front. The high cost of charging infrastructure is one of the main barriers to electric vehicle adoption, and by demonstrating a model for building a diversity of charging infrastructure in an optimal site at lower costs, the Company can advance adoption of this beneficial technology. Additionally, projects that improve grid flexibility will enable integration of higher amounts of renewable energy at lower costs. The Company states that "the proposed approach may be combined in the future with energy storage and solar power to provide critical load backup and a local load for the variable renewable source. The algorithms could be further adapted to predict solar power levels and to minimize the upfront cost and ongoing aging of the battery pack while balancing

the managed system loads."[8] The lessons learned from this project can and should be used in combination with additional renewable energy resources in order to better align electricity usage with generation from these low-cost resources.

In their application, the Company proposes reporting back to the Public Service Commission in 2021 after the program closure. In response to a data request from WRA, the Company states that "throughout the project, the team will hold outreach and workshops to share findings and gain inputs from potential users at other sites."[9] In the interest of developing a shared understanding of the benefits and capabilities of the Company's Power Balance and Demand Response program, we suggest that the Company host stakeholder workshops following the conclusion of each of the four tasks identified in the Company's application.[10]

Battery Demand Response Project.

Through this application the Company requests authorization of $3.27 million in STEP funds for the Battery Demand Response Project as an "innovative utility program" pursuant to U.C.A. 30 § 54-20-105(1)(h). Utah Clean Energy also supports the Company's application for the Battery Project, although we note that considerations of rate design for battery storage are premature and that utility control of customer-owned batteries is not the only way batteries can provide benefits to the grid.

[8] Docket No. 16-035-36, Application to Implement Programs Authorized by the Sustainable Transportation and Energy Act, March 8 2019. Page 8.
[9] Docket No. 16-035-36, RMP Response to WRA Data Request 5.3, April 8 2019.
[10] Docket No. 16-035-36, Application to Implement Programs Authorized by the Sustainable Transportation and Energy Act, March 8 2019. Page 26-27.

The Battery Demand Response Project (Battery Project) is a component of a 600 unit multi-family community planned by Wasatch Development. Each apartment unit in the development will contain a battery paired with solar, and the purpose of the Battery Demand Response Project is to pilot utility control of customer-sited batteries for demand response. The Company anticipates that the Battery Demand Response Project is expected to offset the peak grid loads from the development and reduce peak loading on the grid. The Battery Project will also be operable as a micro-grid and can be used to provide power to the individual residential units in the event of a power outage. The Company estimates the total cost of the Battery Project to be $34.3 million. Of this total cost, $12 million is for the purchase of the batteries and the Company is requesting $3.27 million of STEP funds for the Energy Management System and its integration.

As the cost of battery storage continues to decline, customer-owned and sited batteries will become more prevalent. Most customers who install battery storage are doing so in order to have reliable backup power or to store and use power generated from their rooftop solar array. However, behind-the-meter battery storage can also be operated in order to provide benefits to the grid as a whole if customers are appropriately incentivized to do so. Customer-owned battery storage can be used to shift customer energy usage away from the system peak or to provide active demand response. As described above, improved grid flexibility and flattened or reduced peak loading enables the integration of higher levels of renewable energy resources at lower costs. In its application, the Company also states that this project could reduce transmission congestion, which is necessary to enable the development of new renewable energy resources in

certain parts of Utah. Finally, solar and battery storage can be configured as a micro-grid and used to keep critical facilities online when the power is out, improving grid resiliency.

Of note, the Battery Project will give the Company control of the operation and dispatch of each residential customers' battery, so that the Company can dispatch the batteries for demand response purposes. While utility control enables use of the batteries for active demand response, there are other models through which customer-owned batteries can provide benefits to the grid without enabling utility control. At least eight utilities in the U.S. offer customer incentives for behind-the-meter battery storage, only one of which requires utility control of the customers' battery.[11] Other utilities are using customer agreements or rate structures to incentivize customers to operate batteries in a manner that is beneficial to the grid.

Through the Battery Project, the Company plans to examine the value of having behind-the-meter grid-optimized solar and battery storage interconnected to the Company's electrical system. The Company also plans to gather information to guide and inform future rate design for customers with batteries. The Company states that it will "hire a third party consultant to assist in

[11] The following eight programs provide incentives for customer-owned battery storage. Green Mountain Power requires customer to make their batteries available to the utility during "peak events." SMUD and the California SGIP require that customer discharge their batteries to the grid for specific amounts of time per year, but do not control the battery. The New Hampshire program allows customer to choose between a utility-owned battery or a customer-owned battery.

- Green Mountain Power "Bring Your Own Device" Battery Incentive
- California Self Generation Incentive Program (SGIP)
- Salt River Project Residential Storage Incentive Program
- SMUD Battery Storage Program
- NV Energy Storage Incentive
- MA SMART Program
- NYSERDA Solar Plus Energy Storage
- New Hampshire Battery Storage Program

quantifying the benefits achieved from the energy storage system for both the host customer and the company."[12] Quantification of the benefits of this project should not preclude consideration of the benefits of customer-controlled behind-the-meter storage. Allowing and appropriately incentivizing customer adoption of behind-the-meter battery storage through a variety of ownership and operation models can advance deployment of battery storage and the associated grid benefits. By the nature of its design, this project will gather data about utility operation of a specific brand of customer-owned and utility-operated batteries. While the data gathered through the project will be informative and may be applicable more broadly to different types of battery projects, it should not be used in isolation to develop rate designs. Any future battery storage proceedings should consider the value of a variety of ownership and operation structures and not be limited to utility-controlled opportunities.

Advanced Resiliency Management System.

Last, the Company requests authorization of $16.52 million in STEP funds for the Advanced Resiliency Management System (ARMS) as an "electric grid related project that is cost-effective and in the interest of the Company's utility customers" pursuant to U.C.A. 30 § 54-20-107. Although we support efforts to modernize the electric grid and to improve communications and resiliency, Utah Clean Energy has concerns about using the STEP funds for this project. We are also concerned about the high cost of the ARMS project given that it will be used to improve the operability of customer meters that are already halfway through their useful lives. Given the high anticipated net customer benefits, we suggest that the ARMS project is more appropriately funded through customer rates.

[12] Docket No. 16-035-36, Application to Implement Programs Authorized by the Sustainable Transportation and Energy Act, March 8 2019. Page 41.

The Company's request is for an encoder receiver transmitter (ERT) Gateway System and advanced line sensor hardware on the distribution system. The purpose of the ERT Gateway System is to strategically install ERT Gateway devices in specific locations that enable the Company to communicate with all existing residential Automated Meter Reading (AMR) meters. The advanced line sensor hardware (which includes line sensors and communication-based faulted circuit indicators) will provide outage information to control center operations in order to improve the identification and resolution of issues that cause outages. The Company states that this will improve reliability and enhance outage management capabilities. The ERT Gateway System will also allow customers to access automated, timely, and accurate bills and access more granular information about their electricity usage via their online account.

Unlike the first two proposed projects, which seek to demonstrate the value of emerging energy technologies, the ARMS project appears to leverage commercially available technologies that are already cost-effective. While we support the Company's efforts to modernize the grid and improve reliability for customers, we believe the STEP budget is more appropriately used for projects that are innovative and experimental in nature. Smaller pilot projects like the proposed Battery Project or Intermodal Hub Project may result in relatively minimal immediate customer benefits, but are important to allow the Company to gain experience with new technologies and demonstrate their future benefits. These projects can yield significant long-term customer benefits, but only if the utility is able to demonstrate their cost-effectiveness through pilot projects. Use of the STEP budget on projects that are already cost-effective precludes funding for more innovative and experimental pilot projects.

Second, although Utah Clean Energy supports measures that provide customers with more detailed information about their energy usage, we have concerns about the value of the proposed upgrades to existing AMI meters. Residential customers are currently unable to access interval data for their energy usage, which makes it impossible for a customer to use their own usage history to accurately forecast their financial savings from installing solar without relying on a third-party energy monitoring device. Residential customers receive only a monthly total of the number of kilowatt-hours they have used. The ERT Gateway System will provide customers with AMR meters to access hourly interval data, which will improve customers' ability to forecast their financial savings through solar. However, even this granularity of interval data is not sufficient for an accurate calculation, because solar customers are currently billed based on 15 minute usage.

Third, we are concerned that this project would result in significant expenditures to upgrade AMI meters that are already nearly halfway through their anticipated useful lives.[13] Although we understand that it is prohibitively expensive to upgrade existing AMR meters while they still have 10 or more useful years of operation, one alternative would be to upgrade AMI meters to AMR meters on a rolling basis as replacement of older meters becomes necessary.

The Company anticipates a net benefit of $67.6 million to Utah customers over the 25 year period of this project.[14] Given that the project is anticipated to deliver large net customer

[13] Docket No. 16-035-36, RMP Response to DPU Data Request 13.2, April 16 2019.

[14] Docket No. 16-035-36, Application to Implement Programs Authorized by the Sustainable Transportation and Energy Act, March 8 2019. Page 59.

benefits, we suggest that this project is more appropriately funded through general rates. Doing so would allow the Company to leverage the remaining STEP funds to demonstrate the cost-effectiveness of experimental and innovative pilot projects that advance the sustainable transportation and energy goals of the STEP program.

***Conclusion*.**

Utah Clean Energy is supportive of the Company's proposed Intermodal Hub Project and the proposed Battery Demand Response Project. These projects will allow the Company to evaluate the benefits of innovative energy technologies that will be a key component of a cleaner, more flexible, and more resilient grid. In the case of the Intermodal Hub Project, we suggest that the Company host stakeholder workshops following the conclusion of each of the four tasks identified in the Company's application to provide interim reports on project findings. Although we are supportive of the Company's proposed Advanced Resiliency Management System, given the large anticipated net customer benefits resulting from this project we suggest that the ARMS project is more appropriately funded through general rates.

With best regards,

/s/ Kate Bowman
Kate Bowman, Solar Project Coordinator
Utah Clean Energy

CC: Service List – Docket No. 16-035-36

CERTIFICATE OF SERVICE

I certify that on May 14, 2019, a true and correct copy of the foregoing was served upon the following as indicated below:

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