Rocky Mountain Power
Docket No. 16-035-36
Witness: James A. Campbell

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF UTAH

ROCKY MOUNTAIN POWER

Direct Testimony of James A. Campbell

March 2019

Q. Please state your name, business address and position with PacifiCorp dba Rocky Mountain Power ("the Company").

A. My name is James A. Campbell. My business address is 1407 West North Temple, Salt Lake City, Utah 84116. My present position is Policy and Projects Adviser in the Customer Innovations group.

QUALIFICATIONS

Q. Briefly describe your educational and professional background.

A. I have a Bachelor of Science in Materials Science and Engineering, a Master of Engineering in Environmental Engineering and a Master of Business Administration all from the University of Utah. I have previously worked as an engineer with Foster Wheeler, Boston Scientific, and the Utah Division of Air Quality. In November 2007, I joined the Company as a Senior Environmental Analyst, and I have also worked as a Legislative Policy Adviser in the Government Affairs group.

Q. What are your responsibilities as Policy and Projects Adviser?

A. My primary responsibilities include evaluating and implementing new innovative technologies, policies and programs. I also lead the Company's strategic efforts with electric vehicles and manage the Western Smart Electric Vehicle Community Partnership ("WestSmart EV"), a $4 million United States Department of Energy cost share award to the Company to increase electric vehicle adoption in the intermountain west.

Q. Have you previously appeared as a witness for the Company?

A. Yes. I have presented testimony in regulatory proceedings for Rocky Mountain Power in Utah.

PURPOSE OF TESTIMONY

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

A. The purpose of my testimony is to explain and provide support for the proposed Power Balance and Demand Response to Optimize Charging at Intermodal Hub Project ("Intermodal Hub Project"). The Company respectfully requests the Commission authorize $1,995,576 in STEP funds for the Intermodal Hub Project pursuant to U.C.A. § 54-20-105(1)(h), as an innovative utility program. Additional details for the project are provided in the exhibit that accompanies my testimony, Exhibit RMP___(JAC-1).

INTERMODAL HUB PROJECT

Q. What is being proposed in the Intermodal Hub Project?

A. The Company proposes to develop a power balance and demand response system for a multi modal transportation hub with electric vehicle charging that has high peak power demand. The electric vehicle charging at the multi modal transportation hub will include chargers with outputs of 400 KW per charger. The primary challenge of these higher wattage chargers is the high cost of grid infrastructure and operation and the associated need for high levels of utilization.

This project addresses the challenge by introducing the concept of the Power Balance and Demand Response Intermodal Hub, together with key research components, to adaptively manage power flow between the grid and various electric vehicle 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. Adaptive control algorithms based on forecasting tools will incorporate machine learning techniques that are capable of improving response over time based on historical data. Additionally, cybersecurity measures will be built into the network at the grid interface and site level and at the charger/user interface level. The Intermodal Hub Project will be deployed at the Utah Transit Authority's ("UTA") Intermodal Hub located in Salt Lake City.

Q. Is the Intermodal Hub Project a new concept?

A. Yes. 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 minimize infrastructure and operating costs. The state-of-the-art approach is to perform the design and costs based on a worst-case analysis, resulting in much higher infrastructure costs. The proposed approach uses controls, demand management, and intelligent scheduling to limit peak demand while maintaining high quality of service. This results in lower infrastructure costs and lower operating costs due to improved utilization of the infrastructure. The approach combines, at a single site, 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 service providers. The combination of scheduled and unscheduled services, and high to low power and short- to long-term demands, creates an ideal opportunity to share grid infrastructure costs and actively manage grid impacts and demand charges without significantly impacting quality of service.

Q. Is the Company partnering with any groups on the Intermodal Hub Project?

A. Yes. The Intermodal Hub Project is a unique collaboration of the Company, Utah State

University's Sustainable Electrified Transportation Center ("SELECT"), and the UTA. The proposed control system for power balance and demand response will be developed and evaluated at SELECT's Electric Vehicle Roadway research facility and test track and will be deployed and validated at the UTA's Salt Lake City Intermodal Hub. The UTA site will serve as a living laboratory for data collection and a model showcase of sustainable electrified transportation technology.

Q. What are the potential benefits to customers of the proposed Intermodal Hub Project?

A. The primary benefit is to develop tools that can avoid oversizing of infrastructure equipment by optimizing system design. A key outcome of this project will be a "roadmap" for high power electric vehicle charging complexes that leverage existing infrastructure from dominant peak loads such as TRAX to support a host of additional multi modal vehicle charging needs at minimal cost. The roadmap guides the confluence of accommodating different vehicle types with combined known loading and scheduling of charging (expected and variable) to level peak demand loading on the grid.

The system could serve as a model for deployment of highly efficient and intelligent power management systems to additional UTA and other customer sites. For example, UTA needs to upgrade 50 electrical substations that are used to support the existing TRAX light rails. The technology from this project, if proven, could be deployed to the fifty sites to lower infrastructure and operating costs. It could also enable the large scale expansion of an electric transportation network that would improve utilization of the upgraded infrastructure. It is important to note that an

expanded electric transportation network will be critical for the state to develop "a new, extensive, zero emissions transportation system" as it calls for as part of 2030 Winter Olympics bid.[1]

Q. What are the costs of this Project?

A. The Company is proposing a budget of $1,995,576 in total through the end of 2021. The project costs go to software algorithm development, hardware installation, development and evaluation at USU, UTA site installation, monitoring, and validation, and development of best practices and generalized tools.

CONCLUSION

Q. Please summarize the proposal for Intermodal Hub Project contained in this Application.

A. The Company proposes 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. The proposed cost is $1,995,576 over the three-year term of the STEP pilot period.

Q. In your opinion, is the Company's Intermodal Hub Project consistent with STEP and in the interest of Rocky Mountain Power's customers?

A. Yes.

[1] Olympic & Paralympic Exploratory Committee Report, February 2018.

Q. Does this conclude your direct testimony?

A. Yes.