- BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH -

Application of Rocky Mountain Power to Implement Programs Authorized by the Sustainable Transportation and Energy Plan Act	DOCKET NO. 16-035-36 REPORT AND ORDER

ISSUED: October 31, 2017

SYNOPSIS

The Public Service Commission ("PSC") approves PacifiCorp's Application to Implement Innovative Utility Programs Authorized by the Sustainable Transportation and Energy Plan Act as described in this Report and Order.

I. BACKGROUND AND PROCEDURAL HISTORY

This docket arises out of PacifiCorp dba Rocky Mountain Power's ("PacifiCorp"), Application to Implement Innovative Utility Programs Authorized by the Sustainable Transportation and Energy Plan Act ("Application"), filed on August 15, 2017.

In March 2016, the Legislature enacted and the Governor signed into law the Sustainable Transportation and Energy Plan Act (the "Act"), now codified, among other places, at Utah Code Ann. §§ 54-7-12.8, 54-20-101, *et seq.*[1] PacifiCorp's previous applications in this docket were addressed in three earlier phases; the current Application involves two innovative utility programs as defined by the Act,[2] a Smart Inverter Program and a Microgrid Program. Both programs will be research efforts conducted with partners to assess the potential impact of these

[1] The PSC's Phase One Report and Order in this docket, dated December 29, 2016, contains a relatively broad overview of the Act. This Report and Order discusses only those aspects of the Act pertinent to this phase of the docket. Parties are referred to the PSC's Phase One Report and Order for a more detailed summary of the law.
[2] *See* Utah Code Ann. § 54-20-105.

technologies/practices on PacifiCorp's distribution system. PacifiCorp has requested an effective date of November 1, 2017 for these programs.

On August 18, 2017, the PSC issued a Notice of Filing and Comment Period ("Notice") setting deadlines for comments and reply comments of September 15, 2017 and September 29, 2017, respectively. The Notice states: "If any party would like to request a hearing on the Application or to amend the comment period, such party must file a request with the PSC on or before Friday, August 25, 2017." The PSC received no request for a hearing or to change the ordered comment period.

On September 13, 2017, Western Resource Advocates ("WRA") filed comments and on September 15, 2017 the Division of Public Utilities ("DPU"), the Office of Consumer Services ("OCS"), and Utah Clean Energy ("UCE") filed comments. On September 28, 2017, the Town of Castle Valley ("TCV") filed reply comments, and on September 29, 2017 the DPU, UCE, and PacifiCorp filed reply comments.

II. POSITIONS OF THE PARTIES

PacifiCorp

PacifiCorp's proposed Smart Inverter Program consists of a program budget of up to $450,000 to fund a collaboration with Utah State University and the Electric Power Research Institute to complete a study on the potential effects of smart inverters on PacifiCorp's distribution system and to fund a review of PacifiCorp's distributed energy resource interconnection policy. The latter will identify the necessary modifications required for enabling smart inverter adoption in PacifiCorp's service territory. The Smart Inverter Program includes but is not necessarily limited to the following:

- Lab testing of smart inverters to understand the capabilities of the advanced functionalities and the quality of current manufacturers' implementations.
- Modeling and simulation of multiple distribution circuits to study the impact and potential benefits of smart inverters on distribution circuit hosting capacity and distribution feeder equipment.
- Detailed interpretation of the modified IEEE 1547 interconnection standards and its implications for PacifiCorp's distribution system operations and recommended revisions to PacifiCorp's interconnection policies. The project will investigate suitable settings for distribution-focused distributed energy resource inverter controls including, but not limited to, power factor, volt-var, and voltage/frequency ride-through.
- Development of a guideline document highlighting examples of the recommended smart inverter settings for varying penetration levels of distributed energy resources and the interconnection policy changes needed to accommodate smart inverter implementation.

PacifiCorp's Microgrid Program consists of a program budget of up to $250,000 to fund a collaboration with the Utah State Sustainable Electrified Transportation Center and Hill Air Force Base to deploy a microgrid demonstration project at the USU Electric Vehicle Roadway research facility and test track. With increasing distributed energy resources interconnecting to the grid, PacifiCorp expects light industrial and commercial customers may elect to operate as microgrids to optimize energy costs and improve reliability by having the ability to isolate the facility from the grid during power disturbances and/or outage situations. The purpose of the Microgrid Program is to:

- Demonstrate the feasibility of operating a microgrid on PacifiCorp's system and its effectiveness in automatically transitioning from grid-connected to islanded mode to provide uninterrupted power supply, thereby improving reliability.
- Assess the gap between microgrid system costs and existing value streams.
- Understand impacts on PacifiCorp's distribution system to inform interconnection policy and standards for integrating microgrids.
- Determine the feasibility of microgrids providing ancillary services and further, if necessary, provide recommendations for a microgrid service program.

PacifiCorp states that as additional distributed energy resources interconnect to the grid, it will need to gain experience with technologies that will allow the distributed resources to connect with and operate jointly with PacifiCorp's existing distribution system. These two innovative utility programs will allow PacifiCorp to demonstrate the feasibility of new "smart" technologies, and understand the impact and benefits these technologies can provide to the existing grid. Without the ability to study these technologies now, adoption of these, and potentially other "smart grid" technologies, will take longer to deploy and integrate into the system.

In its reply comments, PacifiCorp agrees to hold quarterly conference calls with interested stakeholders to provide regular program updates on key milestones and share preliminary program findings. As detailed below, PacifiCorp objects to all other proposed changes and/or additions to the proposed programs.

DPU

The DPU concludes approval of the Smart Inverter Program and Microgrid Program is in the public interest and recommends the PSC approve both programs. The DPU's support for these programs is conditional on the same reporting requirements and treatment of potential Operation, Maintenance, Administrative, and General ("OMAG") Expenses the PSC ordered in previous phases of this docket.

The DPU recommends the PSC direct PacifiCorp to consider how cybersecurity threats might compromise PacifiCorp and third-party owned microgrids, rendering the overall grid vulnerable. Additionally, if smart inverters become commonplace as distributed generation penetration increases, the software settings and protocols should be studied as well to ensure system reliability.

The DPU agrees the proposed Smart Inverter and Microgrid Programs will help PacifiCorp personnel gain a better understanding of how smart inverters and microgrids affect PacifiCorp's system, and such understanding could provide future benefits to the system. The DPU maintains including cybersecurity concerns/issues in the studies would also be beneficial for customers.

The DPU states the Smart Inverter Program will inform stakeholders how to integrate smart inverters into the system in a way to maximize system reliability. This includes determining optimal settings, conveying those optimal settings to installers and customers during the interconnection process, and determining a way to communicate updated settings as needed.

The DPU concludes PacifiCorp personnel and all stakeholders need to gain a better understanding of a microgrid's impacts on and potential benefits to the system. As microgrids are

likely to multiply in number in the near future, there are many questions to be answered about their usefulness to utility networks. The DPU believes appropriate regulatory treatment of microgrids must also be explored. This research will help answer many of those questions.

In its reply comments, the DPU objects to all of the changes to the programs proposed by the WRA and UCE, stating the added costs are not justified.

PacifiCorp objects to the DPU's suggestion to address potential cybersecurity vulnerability issues that the use of microgrids might introduce to the overall grid. PacifiCorp maintains that focusing on interconnection and operational issues would be of more value to its customers and that focusing on cybersecurity issues would likely represent duplication of the ongoing research efforts in this area by the U.S. Department of Energy.

OCS

The OCS believes the information that can be obtained from the two programs will be useful for establishing appropriate interconnection policies and guidelines as well as providing relevant information regarding potential system benefits and costs of smart inverters and microgrids. Thus, in the OCS's judgement, these programs are in the public interest.

The OCS recommends that the PSC: 1) authorize PacifiCorp to implement the Smart Inverter Project and the Microgrid Project up to a maximum project cost of $450,000 and $250,000, respectively; 2) require PacifiCorp to follow all reporting requirements previously ordered in this docket; and 3) require PacifiCorp to quickly inform the PSC and interested parties of any significant changes or delays to the projects and the rectifying actions PacifiCorp intends to take.

PacifiCorp did not directly respond to the OCS's suggestions in its reply comments.

WRA

WRA supports both the Smart Inverter Program and the Microgrid Program as proposed by PacifiCorp. WRA recommends the PSC approve both programs with the following additions: 1) The Smart Inverter Program should include the study of hybrid smart inverters; 2) PacifiCorp should contemplate a customer-sited field trial of smart inverters as a second phase to the Smart Inverter Program; and 3) PacifiCorp should consider testing a production-scale microgrid project as a second phase to the Microgrid Program. Finally, WRA recommends the PSC consider opening a new docket in the first quarter of 2019 to amend interconnection rules and policies to take best advantage of smart inverters and microgrids.

PacifiCorp objects to WRA's recommendations. PacifiCorp states it does not support investigation of a specific type of inverter, such as a "hybrid" inverter, as part of the project at this time due to the additional costs an expanded study would require. In addition, PacifiCorp does not support a field trial due to the costs, complexity and challenges of operating smart inverters deployed at customer locations. It further claims there is little evidence that a customer-sited field trial would provide any additional benefit to the research work. PacifiCorp does state that as part of this project, it supports reviewing any available information on other projects that involve a field trial of smart inverters and that it will include lessons learned from such a review in the final project report. PacifiCorp objects to testing a production-scale microgrid because it would be premature at this stage of investigation and extremely expensive. In addition, PacifiCorp asserts it would provide only marginal additional benefits, if any, to PacifiCorp and its customers. Finally, PacifiCorp objects to the PSC committing to open a docket to address interconnection rules and policies at a time certain as national standards have not yet been

established and it believes the time to modify Utah's policies in this area should be after the point in time when those national standards have been published and adopted.

UCE

In the interest of developing a shared understanding of the benefits and capabilities of advanced distributed energy technologies, and of keeping costs low for ratepayers by leveraging existing resources, UCE requests the utility involve interested stakeholders in key research areas related to the program. Specifically, UCE requests PacifiCorp provide stakeholders the following opportunities:

- review preliminary findings from the Smart Inverter Standards and Policy Update when available;
- review a summary research plan for the Smart Inverter Selection and Laboratory Testing study, including detailed information about the inverters, batteries, and battery management software to be tested; and
- review the findings from research areas C (Hosting Capacity Analysis with and without Smart Inverters), D (Determining Smart Inverter Settings), and E (Sharing of Current Utility Practices) when available.

UCE recommends this information be distributed and explained through stakeholder meetings, technical conferences, or written reports, and that parties be given an opportunity to provide comments. UCE is generally supportive of PacifiCorp's Smart Inverter Program proposal and requests PacifiCorp facilitate ongoing participation in this program from interested stakeholders by providing regular program updates at key milestones and sharing proposed research plans and preliminary findings for specific research areas with stakeholders. UCE

believes this will create shared learning opportunities for both PacifiCorp and other stakeholders, and result in more productive future conversations about the capabilities of new technologies to create a cleaner, safer, more affordable and reliable grid. As mentioned above, PacifiCorp agrees to hold quarterly conference calls with interested stakeholders to provide regular program updates on key milestones and share preliminary program findings.

TCV

The TCV supports the initial comments of WRA and it additionally offered the opinion that the TCV was: ". . . a perfect location for RMP phase 2 testing." It further states: "TCV is located on the longest cul-de-sac power line in Utah and possibly the Lower-48. TCV often experiences power outages due to weather and capacity issues. Demand continues to grow as the build-out, currently around 60%, continues and due to two large resorts a bit further out the line on the Colorado River." It concluded its remarks by stating its interest in being a pilot community for a microgrid project.

III. FINDINGS AND CONCLUSIONS

Uncontested Issues - Approval Recommended

The DPU, OCS, UCE, and WRA all recommend the PSC approve both the smart inverter and microgrid programs at PacifiCorp's requested budget levels. These parties all state the proposed programs would be of value to ratepayers and are in the public interest. Based on its review of the filing and comments in this docket, and given the unanimity of opinion of the parties, the PSC concurs the programs are of value to ratepayers and are in the public interest.

Contested Issues – Program Additions

A. Program Reporting: The OCS and UCE request PacifiCorp provide status reports and other information to stakeholders. PacifiCorp proposes to address this issue by holding quarterly conference calls with interested stakeholders. We concur this is a reasonable resolution as it will provide ongoing information to parties. We believe these calls will also address the OCS's request to be quickly informed of any significant changes or delays to the projects and the rectifying actions PacifiCorp intends to take. We encourage PacifiCorp and interested stakeholders to jointly develop the agendas for these calls in a manner that accounts for the parties' interests as stated in their comments. We note PacifiCorp has committed to extensive reporting on all of the STEP programs, including these two proposals, and has stated it intends to adjust the various STEP programs/projects based on the results and feedback it observes and receives over the life of the STEP program. Given that willingness to report on, and potentially revise, the programs the PSC declines to order further changes (beyond those to which PacifiCorp has agreed) to the proposals at this time.

B. Cybersecurity: The DPU proposes to add the study of cybersecurity issues to the Microgrid Program. PacifiCorp objects on the grounds that focusing on interconnection and operational issues would be of more value to its customers and that focusing on cybersecurity issues would likely represent duplication of the ongoing research efforts in this area by the U.S. Department of Energy. We find that studying the issue at this time does not translate into clear benefits for ratepayers and that waiting for the Department of Energy to finish its work will likely reduce the

expected costs for Utah ratepayers. Therefore, we decline to order the addition of cybersecurity issues to the proposal's scope of work at this time.

C. Study hybrid smart inverters, conduct a field trial of inverters, and perform testing on a production scale microgrid: WRA proposes the inclusion of these items in the innovative utility program studies, asserting the knowledge gained would be of use to PacifiCorp's Utah customers. TCV supports WRA's suggested additions and offers the town as a potential pilot for a microgrid study. The DPU objects to the inclusion of these items because it anticipates these additions would significantly increase the costs of the programs. PacifiCorp objects to the inclusion of a specific type of inverter, or field trials, as proposed by WRA, due to the added complexity and cost that field or demonstration trials would entail and asserts research on actual implementation is premature at this time. We find the legislatively authorized budget for the STEP program will be largely expended with the addition of these programs and find merit in PacifiCorp's objections. We decline to order these additions to the proposed programs.

D. Committing to open a docket in 2019 to address interconnection rules and policies: WRA proposes the PSC commit to open a docket to address these issues to ensure adequate standards are in place as these technologies gain wider acceptance among PacifiCorp's customers. Both the DPU and PacifiCorp object to committing to a specific time to open this docket but recognize the issues raised will need to be addressed before these technologies can be used on PacifiCorp's system. PacifiCorp observes that national standards for these technologies have not yet been established

and asserts the best time to modify Utah's policies in this area is after those national standards have been published and adopted. We find that expending resources to set standards for PacifiCorp's Utah system prior to national standards being finalized is premature. Because the timeline for the adoption of those national standards is not clearly known, we decline to commit to a date certain for opening such a docket.

IV. ORDER

1. We approve the Smart Inverter Program as proposed with a budget of $450,000.
2. We approve the Microgrid Program as proposed with a budget of $250,000.
3. We accept PacifiCorp's recommendation that it will conduct the quarterly conference calls it proposes in its reply comments and work jointly with the interested parties to determine appropriate topics of discussion.
4. The reporting requirements and treatment of potential Operation, Maintenance, Administrative, and General Expenses that we ordered in previous phases of this docket apply to the programs we approve in this order.

DATED at Salt Lake City, Utah, October 31, 2017.

/s/ Michael J. Hammer
Presiding Officer

Approved and Confirmed October 31, 2017, as the Order of the Public Service Commission of Utah.

/s/ Thad LeVar, Chair

/s/ David R. Clark, Commissioner

/s/ Jordan A. White, Commissioner

Attest:

/s/ Gary L. Widerburg
PSC Secretary
DW#297694

CERTIFICATE OF SERVICE

I CERTIFY that on October 31, 2017, a true and correct copy of the foregoing was served upon the following as indicated below:

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