

July 18, 2018

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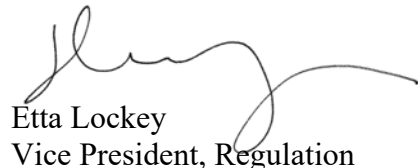
**RE: UM 1857—Stipulation and Joint Testimony**

PacifiCorp d/b/a Pacific Power (PacifiCorp) encloses for filing in this docket the following documents:

- The Stipulation between PacifiCorp, Staff of the Public Utility Commission of Oregon, and the Oregon Citizens' Utility Board; and
- Joint Testimony in Support of the Stipulation.

If you have questions about this filing, please contact Natasha Siores, Manager, Regulatory Affairs, at (503) 813-6583.

Sincerely,

  
Etta Lockey  
Vice President, Regulation

Enclosures

**BEFORE THE PUBLIC UTILITY COMMISSION  
OF OREGON**

**UM 1857**

In the Matter of

PACIFICORP d/b/a PACIFIC POWER

Draft Storage Potential Evaluation

**STIPULATION**

**INTRODUCTION**

PacifiCorp d/b/a Pacific Power (PacifiCorp), Staff of the Public Utility Commission of Oregon (Staff), and the Oregon Citizens' Utility Board (CUB) (collectively the Stipulating Parties) enter into this Stipulation to resolve all issues in docket UM 1857, PacifiCorp's energy Final Storage Project Proposals and Final Storage Potential Evaluation.

**BACKGROUND**

In accordance with House Bill (HB) 2193, Order No. 16-504, Order No. 17-118, and Order No. 17-375, PacifiCorp filed its initial draft Storage Potential Evaluation and Storage Project Proposals on December 29, 2017, proposing a storage potential evaluation and two storage project proposals. On February 23, 2018 PacifiCorp held a stakeholder workshop on the proposals in Portland. Stakeholders filed comments on March 14, 2018.

On April 2, 2018 PacifiCorp filed its Final Energy Storage Potential Evaluation and Final Storage Project Proposals. On May 22, 2018, PacifiCorp held a Commissioner Workshop to present its project proposals to the Commissioners. On May 29, 2018, a settlement conference was held where intervening parties expressed support for, concerns with, and suggestions for improvement of various aspects of PacifiCorp's proposed pilot programs. Based on this discussion, the Stipulating Parties worked collaboratively to reach

consensus on clarifications, modifications and additional requirements for the proposed pilot programs. As a result, the Stipulating Parties enter into this agreement herein (Stipulation). The other intervening parties to this docket, including the Alliance of Western Energy Consumers, Community Renewable Energy Association, Oregon Department of Energy, and Renewable Northwest, chose to not take part in settlement discussions but each has indicated they have no objections to this Stipulation.

### **AGREEMENT**

1. The Stipulating Parties agree that this Stipulation settles all issues in this docket and modifies the Final Storage Potential Evaluation and Final Storage Project Proposals proposed by PacifiCorp in its April 2, 2018 filing as described in the terms below.
2. The Stipulating Parties agree to submit this Stipulation to the Commission and request that the Commission approve the Stipulation as presented. The Stipulating Parties agree that this Stipulation is a reasonable resolution of the issues in this proceeding and meets the three approval requirements set out in HB 2193.<sup>1</sup>

#### **Energy Storage Potential Evaluation**

3. PacifiCorp agrees to file in this docket a detailed written explanation of its Energy Storage Potential Evaluation plan that includes the incremental next steps it will take to advance its energy storage modeling capability to estimate all benefits. The benefits, including sub-hourly benefits, are to be estimated for each use-case in

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<sup>1</sup> See Oregon Laws 2015, chapter 312, section 3(3)(a)(A)-(C) (“The commission shall . . . evaluate each proposal to determine whether the proposal: (A) Is consistent with the guidelines adopted under subsection (1) of this section; (B) Reasonably balances the value for ratepayers and utility operations that is potentially derived from the application of energy storage system technology and the costs of construction, operation and maintenance of energy storage systems; and (C) Is in the public interest.”).

Commission Orders No. 16-504, 17-118, and 17-375 and co-optimized; however, the Stipulating Parties recognize that, in the near-term and the long-term, the value may be zero. PacifiCorp's Energy Storage Potential Evaluation plan will set clear milestones with explanations regarding the analysis or tool development necessary to advance its methodologies to the forefront of Energy Storage System (ESS) benefit modeling. This plan must be filed within 90 days from Commission approval of this Stipulation.

4. Nothing in this Stipulation shall preclude the Commission from directing PacifiCorp to refile its Energy Storage Potential Evaluation plan.
5. Staff agrees to make best efforts to provide a recommendation on approval of the Energy Storage Potential Evaluation plan to the Commission at a public meeting no later than 90 days from the date of PacifiCorp's filing.
6. Upon approval, PacifiCorp will implement the approved Energy Storage Potential Evaluation plan, and will include the newly estimated benefits along with all costs associated with the ESS pilot in a filing in docket UM 1857 to be made no later than June 3, 2019.

#### **Pilot Project #1**

7. The Stipulating Parties agree that Phase 1 and Phase 2 of Pilot Project #1 as modified by the terms of this Stipulation are consistent with the Commission guidelines adopted pursuant to subsection (1) of HB 2193 (2015); reasonably balances the value for ratepayers and utility operations potentially derived from the application of energy storage system technology and the costs of construction, operation, and maintenance of energy storage systems; and is in the public interest.

8. The Stipulating Parties agree that costs recoverable from ratepayers for Pilot Project #1 shall be capped as follows:

Phase 1 Capital Costs	Phase 2 Capital Costs
\$3.0 million	\$1.5 million

9. Consistent with standard utility practice, the Stipulating Parties agree that all costs, including the capital costs, whether falling above or below the cap listed above, are subject to standard prudence review.
10. PacifiCorp confirms that no Operations & Maintenance costs will be capitalized.
11. For purposes of project evaluation and cost recovery, the Stipulating Parties agree that Pilot Project #1 will have a 15-year asset life.
12. The Stipulating Parties agree that the minimum ESS capacity/energy for Phase I will be 2 megawatts (MW)/6 megawatt-hours (MWh) and for Phase II will be 800 kilowatts (kW)/1 MWh.
13. The Stipulating Parties agree that the cost recovery method for this project will be determined at a future time, and PacifiCorp agrees to serve the parties to docket UM 1857 with a copy of its application for cost recovery for Pilot Project #1 at the time it is filed.
14. PacifiCorp agrees to provide a breakdown of how capacity was modeled to test each use case planned for Pilot Project #1.

**Pilot Project #2**

15. PacifiCorp agrees to file a revised plan for Pilot Project #2 after selecting a Technical Assistance Concept Consultant and completing a limited number of initial studies. The Stipulating Parties agree that PacifiCorp may recover from customers no more than \$200,000 in prudently incurred costs to complete this initial work. The revised

- plan will estimate in detail the costs, benefits, and anticipated learnings associated with Pilot Project #2.
16. Staff agrees to make best efforts to provide a recommendation on whether or not to approve the revised plan for Pilot Project #2 to the Commission at a public meeting no later than 90 days from the date of PacifiCorp's filing.

**Additional Items**

17. The areas to be studied and the learnings to be gained from Project #1 that were agreed to by the Stipulating Parties are included in Appendix A to this Stipulation.
18. PacifiCorp agrees to file an annual update on the progress of the Pilot Project #1 (and Pilot Project #2 if PacifiCorp's revised plan is approved), and will also file a comprehensive evaluation of the pilot projects after the energy storage systems have been in operation for three years, as well as after the end of the 6th year in operation, and after the end of the 10th year in operation. The content of these evaluations will include a comparison to the performance of PacifiCorp's other ESSs. The Commission may direct PacifiCorp to include additional topics and/or data in the annual update and/or evaluations to ensure that adequate learning and data collection is achieved from the pilot projects.
19. These annual updates will include a narrative explanation of EIM benefits that have been achieved, and if not, why they have not been achieved.
20. Also included in the annual updates, PacifiCorp agrees to provide parties to docket UM 1857 with a copy of the annual Sustainable Transportation and Energy Plan Project Status Report (Report) that is filed with Utah Public Service Commission for a period not beyond the lower of the: life of Project Project #1, or the life of the

storage project being built in Panguitch, Utah. Along with this Report, PacifiCorp will also provide a quantitative evaluation of the costs and benefits of the ESS in Project #1 relative to all other ESSs operated by PacifiCorp, and a narrative discussion on whether any learnings from PacifiCorp's other storage projects can be applied in Oregon. If such a comparison is not appropriate or applicable to Oregon, PacifiCorp will provide a narrative discussion explaining why.

21. The Stipulating Parties agree that this Stipulation represents a compromise in the positions of the Stipulating Parties. Without the written consent of all Stipulating Parties, evidence of conduct or statements, including but not limited to term sheets or other documents created solely for use in settlement conferences in this docket, and conduct or statements made at settlement conferences, are confidential and not admissible in the instant or any subsequent proceeding, unless independently discoverable or offered for other purposes allowed under ORS 40.190.
22. The Stipulating Parties have negotiated this Stipulation as an integrated document. If the Commission rejects all or any material part of this Stipulation, or adds any material condition to any final order that is not consistent with this Stipulation, each Stipulating Party reserves its right: (i) to withdraw from the Stipulation, upon written notice to the Commission and the other Stipulating Parties within five (5) business days of service of the final order that rejects this Stipulation, in whole or material part, or adds such material condition; (ii) pursuant to OAR 860-001-0350(9), to present evidence and argument on the record in support of the Stipulation, including the right to cross-examine witnesses, introduce evidence as deemed appropriate to respond fully to issues presented, and raise issues that are incorporated in the

settlements embodied in this Stipulation; and (iii) pursuant to ORS 756.561 and OAR 860-001-0720, to seek rehearing or reconsideration, or pursuant to ORS 756.610 to appeal the Commission order. Nothing in this paragraph provides any Stipulating Party the right to withdraw from this Stipulation as a result of the Commission's resolution of issues that this Stipulation does not resolve.

23. This Stipulation will be offered into the record in this proceeding as evidence pursuant to OAR 860-001-0350(7). The Stipulating Parties agree to support this Stipulation throughout this proceeding and in any appeal, provide witnesses to support this Stipulation (if specifically required by the Commission), and recommend that the Commission issue an order adopting the settlements contained herein. By entering into this Stipulation, no Stipulating Party shall be deemed to have approved, admitted or consented to the facts, principles, methods or theories employed by any other Stipulating Party in arriving at the terms of this Stipulation. Except as provided in this Stipulation, no Stipulating Party shall be deemed to have agreed that any provision of this Stipulation is appropriate for resolving issues in any other proceeding.
24. This Stipulation may be signed in any number of counterparts. Each counterpart is an original. Together, all counterparts form one single document.



**For PacifiCorp:**

Signature: 

Name: ETTA LOCKEY

Title: Vice President, Regulation

Date: 7/18/18

**For Staff:**

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**For CUB:**

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**For PacifiCorp:**

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**For Staff:**

Signature: Kaylie Klein

Name: Kaylie Klein

Title: AAG for Staff

Date: 7/18/18

**For CUB:**

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

For CUB:

Signature:



Name:

MIKE GOETZ

Title:

Staff Attorney

Date:

7/18/18

## **Appendix A**

The areas to be studied and learnings to be gained through the construction, integration, and implementation of Pilot Project #1 are as follows:

- Effective charge and discharge rates
- Roundtrip efficiency
- Capacity factor
- Charging time
- Discharging time
- Idle time
- Daily operating cost
- List of applications
- Planned maintenance costs
- Unplanned maintenance cost
- Energy storage availability
- Use case testing and evaluation
- State of charge performance

Docket No. UM 1857  
Stipulating Parties/100  
Witnesses: Amy McCluskey,  
Seth Wiggins, and William  
Gehrke

**BEFORE THE PUBLIC UTILITY COMMISSION  
OF OREGON**

**STIPULATING PARTIES**

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Joint Testimony of Amy McCluskey, Seth Wiggins, and  
William Gehrke

July 18 2018

**UM 1857**

PacifiCorp's Final Energy Storage Potential Evaluation and Final  
Project Proposals

**Joint Testimony in Support of Stipulation**

1 **Q. Please state your name, business address, and present position.**

2 A. My name is Amy McCluskey. My business address is 825 N.E. Multnomah  
3 Street, Suite 1700, Portland, Oregon, 97232. My title at PacifiCorp is Manager of  
4 Asset Strategy and Policy for Transmission and Distribution Operations. I am an  
5 experienced mechanical engineer and currently hold a Project Management  
6 Professional Certification. Before joining PacifiCorp, I was employed by Royal  
7 Dutch Shell as a petroleum engineer working in oil and gas energy exploration,  
8 extraction, and development across multiple basins in various countries worldwide. I  
9 have been employed by PacifiCorp since August 2017.

10 My name is Seth Wiggins. My business address is 201 High Street SE,  
11 Salem, Oregon 97301. I am a Senior Renewable Analyst at the Public Utility  
12 Commission of Oregon (Commission).

13 My name is William Gehrke. My business address is 610 SW Broadway,  
14 Suite 400, Portland, Oregon, 97205. I am an Economist for the Oregon Citizens'  
15 Utility Board (CUB), and am testifying on behalf of CUB.

16 **Q. What is the purpose of the joint testimony in this proceeding?**

17 A. This joint testimony describes the terms of the settlement (Stipulation) reached by  
18 PacifiCorp, Public Utility Commission of Oregon Staff (Staff), and CUB,  
19 (collectively, the Stipulating Parties). This joint testimony also asks the Commission  
20 to approve the energy storage programs proposed by PacifiCorp, as they have been  
21 modified by the terms of the Stipulation.

22 **Q. How was the settlement reached?**

23 A. In accordance with House Bill (HB) 2193, Order No. 16-504, Order No. 17-118, and

1 Order No. 17-375, PacifiCorp filed its revised draft Storage Potential Evaluation and  
2 initial draft Storage Project Proposals on December 29, 2017. This filing proposed an  
3 energy storage potential evaluation methodology and two pilot project proposals to  
4 accelerate energy storage in PacifiCorp's Oregon service territory.

5 On February 23, 2018, PacifiCorp held a stakeholder workshop on the revised  
6 draft storage potential evaluation and draft project proposals in Portland, Oregon.  
7 Comments from stakeholders were filed on March 14, 2018. PacifiCorp filed its  
8 Final Energy Storage Potential Evaluation and Final Storage Project Proposals on  
9 April 2, 2018. On May 22, 2018, PacifiCorp held a Commissioner Workshop to  
10 present its proposal to the Commissioners. On May 29, 2017, a settlement conference  
11 was held where intervening parties expressed support for, concerns with, and  
12 suggestions for improvement of various aspects of PacifiCorp's proposed storage  
13 evaluation methodology and proposed storage projects. Based on this discussion, the  
14 Stipulating Parties worked collaboratively to reach consensus on clarifications,  
15 modifications, and additional requirements for the proposed energy storage projects.

16 **Q. Please summarize the settlement.**

17 A. The Stipulation settles all issues in this docket and modifies the Final Storage  
18 Potential Evaluation and Final Storage Project Proposals proposed by PacifiCorp in  
19 its April 2, 2018 filing as further described in this joint testimony.

20 **Q. Please summarize the Stipulation terms regarding the Energy Storage Potential**  
21 **Evaluation.**

22 A. PacifiCorp agreed with the other Stipulating Parties to develop a plan to advance its  
23 energy storage modeling capability beyond what was filed in its Final Energy



1 Storage Potential Evaluation. This new plan will set clear milestones and provide  
2 explanations regarding the analysis or tool development necessary to advance  
3 PacifiCorp's methodologies to the forefront of Energy Storage System (ESS) benefit  
4 modeling. For example, the new plan will explain how PacifiCorp will estimate the  
5 benefits, including sub-hourly benefits, for each use-case in Commission Orders No.  
6 16-504, 17-118, and 17-375, co-optimized. The Stipulating Parties also note that  
7 when estimating these benefits at the hourly and sub-hourly level, some of the values  
8 may be zero in the near-term and long-term.

9 **Q. Please explain how the Stipulating Parties intend for the plan discussed above to**  
10 **be reviewed by the Commission.**

11 A. PacifiCorp will file its plan within 90 days from Commission approval of this  
12 Stipulation, and Staff will make a recommendation on whether to approve this plan to  
13 the Commission at a public meeting no later than 90 days after the plan is filed. Upon  
14 approval, PacifiCorp will then implement this plan, and will include the newly  
15 estimated benefits along with all costs associated with the ESS pilot in a filing to be  
16 made no later than June 3, 2019.

17 **Q. Please summarize the Settlement Stipulation terms regarding Project # 1.**

18 A. The Stipulating Parties agreed to the following adjustments to Project #1:

- 19 • The costs recoverable from ratepayers for this project under this Stipulation shall  
20 be capped at \$3 million for Phase 1 and \$1.5 million for Phase 2. However,  
21 consistent with standard utility practice, all costs, including capital costs above  
22 and below the cap, are recoverable only after being subject to standard prudence  
23 review.

- 1           • PacifiCorp has agreed not to capitalize Operations & Maintenance (O&M) costs
- 2           associated with Project # 1.
- 3           • For purposes of project evaluation and cost recovery, Project # 1 will have a
- 4           15-year asset life.
- 5           • The minimum ESS capacity/energy size for Phase 1 will be 2 megawatts (MW)/6
- 6           megawatt-hours (MWh) and for Phase II will be 800 kilowatts/1 MWh.
- 7           • PacifiCorp will provide a breakdown of how capacity was modeled to test each
- 8           use case planned for Project # 1.

9   **Q.   Please explain why pursuing Project #1 is in the public interest.**

10 A.   Project #1 is in the public interest because it is expected to address system needs and  
11 provide generation capacity, ancillary services, distribution deferral benefits, and  
12 significant learning opportunities. Please see Appendix A to the Stipulation for a list  
13 of the areas to be studied and the learnings to be gained from Project #1 that were  
14 agreed to by the Stipulating Parties. Further, this energy storage system is also  
15 expected to reduce outages and increase reliability, thereby providing outage  
16 mitigation benefits to the Company's system. Due to the variety of loads, and  
17 combination of conventional and renewable generation at the location selected for  
18 Project # 1, this project is expected to provide real-world operational experience and  
19 valuable learning opportunities that are widely applicable and directly transferrable to  
20 future deployment of energy storage resources within PacifiCorp's Oregon service  
21 territory.

22 **Q.   Please summarize the Stipulation terms regarding Project # 2.**

23 A.   The Stipulating Parties agreed to the following adjustments to Project #2:

- 1           • PacifiCorp will select a Technical Assistance Concept Consultant and complete  
2           a limited number of initial studies. PacifiCorp will spend no more than  
3           \$200,000 to complete this initial work. After completing this initial work,  
4           PacifiCorp will file a revised plan. This plan will estimate in detail the costs,  
5           benefits, and anticipated learnings associated with Project # 2. Staff will then  
6           review the plan, and make best efforts to provide a recommendation on whether  
7           to approve this plan to the Commission no later than 90 days after PacifiCorp  
8           files the plan.

9   **Q.    Please explain why pursuing Project #2 is in the public interest.**

10   A.    This project recognizes that customers and communities have an interest in using  
11    behind-the-meter energy storage to maintain power for critical facilities and  
12    infrastructure during extended outages and that those resources could also provide  
13    system benefits to PacifiCorp and its other customers. However, the needs of  
14    individual customers and communities in the Company's service territory are  
15    different. By identifying technical requirements, costs, and benefits of behind-the-  
16    meter energy storage for resiliency applications, Project #2 will help identify how  
17    compensation for the system benefits of energy storage systems can help customers  
18    achieve both individual and state-wide resiliency goals. This project will also  
19    enhance PacifiCorp's ability to include energy storage in further distributed energy  
20    resource planning. Therefore, this project benefits the public interest by providing  
21    direct resiliency benefits and opportunities for the utility to learn more about utilizing  
22    behind-the-meter energy storage.

1 **Q. Please describe additional settlement terms.**

2 A. The Stipulation includes the following additional terms that represent collaboration  
3 and compromise by the Stipulating Parties:

4 • The parties have developed Appendix A to the Stipulation, which describes the  
5 areas to be studied and the learnings to be gained from Project # 1.

6 • PacifiCorp has agreed to file an annual update on the progress of the Pilot  
7 Project # 1 (and Pilot Project #2 if PacifiCorp's revised plan is approved), and  
8 will also file a comprehensive evaluation of the pilots after the energy storage  
9 systems have been in operation for three years, as well as after the end of the 6th  
10 year in operation, and after the end of the 10th year of operation. The annual  
11 updates will include a narrative explanation of Energy Imbalance Market (EIM)  
12 benefits that have been achieved, and if not, why not.

13 • Additionally, in order to help Staff understand any learnings that PacifiCorp is  
14 leveraging from other storage projects across their system, the annual updates  
15 will also include a copy of the annual Sustainable Transportation and Energy  
16 Plan Project Status Report (Report) that is filed with the Utah Public Service  
17 Commission. Along with this Report, PacifiCorp will also provide a  
18 quantitative evaluation of the costs and benefits of the ESS in Project # 1  
19 relative to all other ESSs operated by PacifiCorp, and a narrative discussion on  
20 whether any learnings from PacifiCorp's other storage projects can be applied in  
21 Oregon.

1 **Q. Do the Stipulating Parties believe that the settlement satisfies the requirements**  
2 **of House Bill 2193, Order No. 16-504, Order No. 17-118, and Order No. 17-375?**

3 A. Yes. Taking into account the modifications made to both PacifiCorp's Final Storage  
4 Potential Evaluation and Final Storage Project Proposals, the Stipulating Parties agree  
5 that the requirements of HB 2193 and relevant Commission orders are satisfied. The  
6 energy storage evaluation methodology and storage projects are designed to  
7 accelerate energy storage in PacifiCorp's service territory and to gather data to inform  
8 future system and program planning. The settlement will provide benefits to  
9 residents of Oregon, allow PacifiCorp to gain experience with energy storage to  
10 inform future refinements and adjustments, and provide diverse learning opportunities  
11 and valuable information for future evaluation and deployment.

12 **Q. Why does PacifiCorp support the Stipulation?**

13 A. While PacifiCorp believes the energy storage methodology and energy storage  
14 projects proposed in the company's April 2, 2018 filing represent appropriate initial  
15 efforts to implement energy storage in its service territory and were worthy of  
16 Commission approval as proposed, we also recognize Stipulating Parties' concerns  
17 and believe the settlement is a fair compromise that will allow PacifiCorp to install  
18 energy storage in its service territory in accordance with the objectives of House Bill  
19 2193, Order No. 16-504, Order No. 17-118, and Order No. 17-375. PacifiCorp  
20 supports the Stipulation as it allows the company to progress with Project # 1 and  
21 Project # 2, address system needs, explore the range of benefits from energy storage  
22 systems, and gain valuable experience with energy storage projects to better inform  
23 the future of storage modeling. The pilot projects as proposed in the Energy Storage

1 Final Project Proposal and modified by the Stipulation are consistent with the project  
2 and proposal guidelines, reasonably balances the value and costs of each energy  
3 storage system, and is in the public interest.

4 Consistent with Order No. 16-504 and HB 2193 guidelines and requirements,  
5 Project #1 and Project #2 present both short and long term potential value by serving  
6 multiple applications and have the potential to improve system operation, reliability,  
7 and resiliency throughout PacifiCorp's Oregon service territory. The specific  
8 location, scope, and small scale of each pilot project allow PacifiCorp to explore the  
9 various applications of energy storage technology in controlled environments to  
10 maximize widely applicable and directly transferrable learning opportunities at  
11 prudent costs, reasonably balancing the value and costs for all Oregon customers.  
12 Progressing these projects specifically provides PacifiCorp with real work experience  
13 designing, constructing, integrating, and operating energy storage within its existing  
14 service territory. Data collected and areas to be studied, as included in Appendix A  
15 of the Stipulation, will provide greater confidence in cost planning and help to  
16 validate and refine future modeling of potential energy storage benefits. This  
17 experience will benefit the public as it will directly influence PacifiCorp's future  
18 strategy for evaluation and wide scale deployment of energy storage technology.

19 The initial funding for Project #2 included in this Stipulation will allow the  
20 company to conduct a small number of site specific studies. While these studies will  
21 most directly benefit these community facilities selected to participate, it will provide  
22 information for PacifiCorp to begin to understand the system characteristics for  
23 commercial customer sited storage. Understanding these fundamental characteristics

1 of commercial customer sited storage is a prerequisite to developing opportunities  
2 and programs where the company and customers share the benefits of customer sited  
3 storage. While this small sample will provide limited actionable information, it will  
4 allow stakeholders an opportunity to evaluate if the project should be expanded to its  
5 initial proposed size.

6 PacifiCorp's new plan for its energy storage methodology and the two project  
7 proposals as modified will provide critical experience, data, and frameworks to  
8 support PacifiCorp's future system and program planning.

9 **Q. Why does Commission Staff support the Stipulation?**

10 A. Staff supports the Stipulation because it provides an opportunity to grow PacifiCorp's  
11 capability in development and deployment of ESS pilots at a reasonable cost to  
12 ratepayers. The potential of battery storage to improve many challenges in reliability,  
13 affordability, and sustainability is immense, but significant operational and economic  
14 challenges remain at this point in time. The two individual pilot projects, with the  
15 modifications described in the Stipulation, that the Stipulating Parties have agreed to,  
16 and PacifiCorp's to-be-improved Energy Storage Potential Evaluation, offer a method  
17 of exploration: the market stimulation and learnings associated with the ESS  
18 procurement in this Stipulation will increase PacifiCorp's ability to locate additional  
19 storage opportunities on its system, especially when it implements the changes  
20 required by the Stipulation to further develop its Energy Storage Potential Evaluation.  
21 Based on the information provided by PacifiCorp, Staff expects the modest costs for  
22 the two projects to be eclipsed by the benefits that well-integrated ESSs can provide

1 for ratepayers in the future. Accordingly, Staff is encouraged by the agreements and  
2 modification reached in the Stipulation.

3 ***The project proposals reached in the Stipulation are consistent with Commission project***  
4 ***and proposal guidelines***

5 In its reply comments, Staff expressed concerns that both the storage potential  
6 evaluation and both of PAC's individual projects did not meet the Commission's  
7 established guidelines. These concerns have been alleviated by the changes the  
8 programs to which PacifiCorp and the other Stipulating Parties have agreed, as well  
9 as the additional analysis described below which PacifiCorp will provide to Staff  
10 going forward. Together, these modifications to PacifiCorp's Final Storage Potential  
11 Evaluation and individual project proposals make Staff comfortable that the overall  
12 proposal upholds the Commission guidelines.

13 With regard to the comprehensive energy storage potential evaluation required  
14 by HB 2193 (2015), Staff was initially concerned that the storage potential evaluation  
15 did not credibly estimate the ex-ante benefits associated with ESS. This concern has  
16 been mitigated in this Stipulation as PacifiCorp has agreed to provide a detailed  
17 implementation plan to advance its modeling capacity, to be approved by Staff. Staff  
18 believes this is an acceptable compromise, and that it will lead to the highest level of  
19 cost-effective battery storage development.

20 In its reply comments, Staff articulated a number of concerns relating to each  
21 individual project not complying with specific Commission guidelines. Staff's main  
22 concern with Project #1 was that the capacity needs for the designated location would  
23 preclude the ability to test each use case found in Commission Order 16-504. To



1 alleviate this concern, PacifiCorp has agreed to detail how the estimation of the  
2 benefits provided from each use case will not be prevented by capacity concerns, as  
3 well as the times of the year when capacity needs will be paramount. Staff's concerns  
4 with Project #2 included concerns that the costs, grid benefits, locations, and project  
5 selection criteria were all insufficiently detailed in PacifiCorp's filing. The  
6 Stipulating Parties have agreed to allow the recovery of a small amount of prudently-  
7 incurred costs for a consultant to develop this project into one that meets Commission  
8 guidelines.

9 ***This proposal reasonably balances the value and costs associated with each ESS***

10 A number of agreements in this Stipulation have improved the balance  
11 between value of the ESS and costs. By agreeing to cost-caps on both projects and  
12 clearly expressing the prudence review that will occur for all costs when PacifiCorp  
13 seeks to recover costs from customers, the Stipulating Parties have limited cost-  
14 overrun exposure. Further, for Project #1, parties have required that the ESS will  
15 have a minimum capacity/duration of 2 MW/6 MWh, which will help keep the cost  
16 per MW relatively low. PacifiCorp has also agreed with the other Stipulating Parties  
17 that no O&M costs will be capitalized. Together, these stipulated additions to  
18 PacifiCorp's filed proposal will provide higher value from the pilots while keeping  
19 ratepayer contributions to a minimum.

20 ***This proposal is in the public interest***

21 Conditional on each of the stipulated terms mentioned above being met, Staff  
22 believes the benefits of both projects will outweigh the associated costs.

23 Implementing Project #1 and developing Project #2 will provide PAC with tangible

1 experience with the procurement, installation, operation, and evaluation of ESSs  
2 within its electricity network. Additionally, increased demand for ESSs at the utility,  
3 residential, and commercial level should assist with stimulating the battery storage  
4 market, leading to increased capacity and lower costs overall.

5 Aggregated together, these benefits are expected to significantly increase  
6 PacifiCorp's ability to operate and further deploy battery storage on its grid. This  
7 would be extremely beneficial to the public and causes little in the way of increased  
8 costs to PacifiCorp's utility customers. Importantly, utility-scale battery storage has  
9 the potential to solve the limitation caused by the intermittency of renewable  
10 resource-based generation, providing a method of widespread reliable, least-cost, and  
11 carbon-free generation.

12 **Q. Why does CUB support the settlement?**

13 A. CUB supports the Stipulation as a reasonable compromise of the issues raised in this  
14 docket that comports with the requirements set forth in HB 2193 and Commission  
15 Orders No. 16-504 and 17-118. CUB believes that the Stipulation is in the public  
16 interest, adequately protects residential ratepayers, and enables the company to  
17 produce key takeaways and learnings regarding how different energy storage  
18 applications can provide a benefit to its system. Energy storage will be a necessary  
19 piece of utility operations going forward, and it is essential to gain learnings as this  
20 technology begins to roll out. CUB believes that the capital cost caps proposed in the  
21 Stipulation provide adequate protections to customers. CUB and Staff were initially  
22 concerned with the lack of information needed to fully analyze the company's Project  
23 #2. However, due to the aforementioned cost caps and takeaways, CUB is now able

1 to support the company's proposal encapsulated in the Stipulation and this supporting  
2 testimony.

3 **Q. Does this conclude your joint testimony?**

4 **A. Yes.**

## CERTIFICATE OF SERVICE

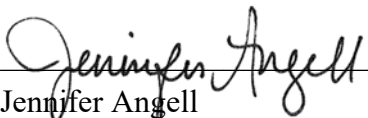
I certify that I electronically filed a true and correct copy of PacifiCorp's **Stipulation and Joint Testimony** on the parties listed below via electronic mail and/or overnight delivery in compliance with OAR 860-001-0180.

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Dated July 18, 2018.

  
 Jennifer Angell  
 Supervisor, Regulatory Operations