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June 22, 2016

Electronic Mail

Oregon Public Utility Commission
201 High Street, SE Ste. 100
PO Box 1088
Salem, OR 97308-1088

Re: **UM 1751 Implementing an Energy Storage Program Guidelines**

Attention Filing Center:

PGE appreciates the opportunity to submit comments on questions to inform the straw proposal.

As our responses to the questions demonstrate, we encourage the Commission to promote rigor in utility plans and considerations, but to allow flexibility in how the utilities demonstrate such rigorous planning and in the projects the utilities choose to propose to meet the mandate.

PGE is proud of our leadership in energy storage, and we look forward to continuing to work collaboratively with all stakeholders in this docket.

Thank you for the opportunity to comment.

Karla Wenzel
Manager

KW/sp

BEFORE THE PUBLIC UTILITY COMMISSION OF OREGON

UM 1751

In the Matter of	)	
	)	
OREGON PUBLIC UTILITY COMMISSION	)	PORTLAND GENERAL ELECTRIC'S COMMENTS ON QUESTIONS TO INFORM STRAW PROPOSAL
Implementing an Energy Storage Program Guidelines	)	

Introduction

House Bill 2193 requires the OPUC to adopt, no later than January 2017, guidelines for Portland General Electric Company (PGE or Company) and PacifiCorp to use in submitting proposals for energy storage projects. As a next step in this proceeding, the OPUC is considering drafting a straw proposal of the guidelines. To inform this process, the OPUC asked parties to comment on 25 questions posed in five sections. PGE appreciates the opportunity to provide input to the development of the guidelines.

PGE is proud of our leadership in energy storage with the deployment of the Salem Smart Power Center. Our 5 MW/1.25MWh system puts us at the front of the industry in terms of understanding how we can utilize storage to benefit customers and meet system needs. Storage holds the potential of providing a more cost-effective way to meet system capacity, integrate variable renewable resources, provide ancillary services, and extend the value of transmission and distribution assets, all while simultaneously improving reliability for customers. HB 2193 requires us to procure at least an additional 5 MWh of storage, and we believe that storage technology is likely to mature quickly such that significantly more storage could soon make sense on our system.

The electric utility industry is in an era of rapid change. To continue delivering electricity in the most effective and efficient manner, we must be proactive, nimble, and flexible in our approach to new technologies such as storage. PGE views HB 2193 as an opportunity to, in effect, successfully pilot a number of different approaches to energy storage in various locations on our system. We encourage the Commission to adopt guidelines that are drafted with an eye towards developing a number of relatively small-scale projects that allow learning, and if they prove worthwhile, are positioned to scale quickly to allow all of PGE's customers to benefit from wise investments in storage technology.

When considering storage and other smart grid investments, PGE takes a similar approach, which we have described in our annual Smart Grid Report:

i) **Modeling and monitoring** *(planning ahead)* – Understanding our customers, systems, and industry changes to guide engagement and prioritization;
ii) **Engaging** *(successfully piloting)* – By actively listening to the needs of customers and the voices of all stakeholders, we develop pilots that have meaningful, foundational learnings and deploy effective and valuable full-scale programs; and
iii) **Integrating** *(moving to scale)* – Building upon our foundational initiatives to scale proven technologies that drive new customer value.

We encourage the Commission to adopt guidelines for energy storage in the context of HB 2193 that are consistent with this approach. As our specific responses to the questions demonstrate, PGE encourages the Commission to establish guidelines that require rigor in utility plans and considerations, but allow flexibility in how the utilities demonstrate such rigorous planning and in the projects the utilities choose to propose to meet the mandate. Such guidelines will allow PGE to take a measured, planful and evolutionary approach to energy storage and will position both the utilities and the Commission to consider more significant investments in storage as the technology continues to mature.

What guidance should the Commission provide on the storage potential analyses?

1. Should the evaluations of storage potential be filed separately?

The Commission should require utilities to file evaluations of storage potential concurrently with project proposals. PGE agrees with the approach outlined in HB 2193 as it enables utilities to demonstrate how the projects they are proposing match current and potentially future system needs. It requires that "each proposal submitted…must include an evaluation of the potential to store energy in the electric company's electric system". Sec. 3.2.b. The text of the law indicates that the evaluation be included within the submission of a project proposal, not separately.

2. What guidance, if any, should we provide about the analyses to be conducted?

We recommend the OPUC direct utilities to develop specific screening criteria regarding storage potential on their grid that can be used to demonstrate the value of pursuing one or more of the projects proposed. By developing specific criteria, it allows the utility to evaluate a subset of locations for storage potential, rather than performing an unnecessary, overly broad, and unjustifiably costly analysis of the company's system. We believe this approach is in alignment with the HB 2193 requirement that the evaluation of storage potential includes "an analysis of: The electric company's current operations and the electric company's electric system data, including customer-side data, distribution data, transmission data and data related to existing energy storage systems, including any energy storage system developed as part of a pilot or demonstration project. The analysis shall be used to identify areas in the electric company's electric system where there may be opportunities to incentivize the value potentially derived from energy storage systems." Sec. 3.2.b

3. Should utilities systematically identify and rank order the areas of opportunity?

Utilities should systemically identify the areas of opportunity and share them in the context of their proposals. The areas identified, however, do not need to be ranked beyond explaining why some have been chosen for proposals while others have been excluded at the time of the submission. Ordering the areas of opportunity more specifically is not required under the legislation and does not promote diversity in project proposals. Moreover, it could imply a greater level of understanding of the areas of opportunity than any stakeholder, including the utilities, have today.

4. What guidance, if any, should we provide about the details of the evaluation report filed with the Commission?

The Commission should provide the utilities flexibility in the amount of detail they provide in their evaluation reports. If the Commission requires specific data to be included within an evaluation report that could potentially include "critical energy infrastructure information, trade secrets and other confidential research, development or commercial information the public disclosure of which could threaten the security and safety of an electric company's electric system or allow unfair competition or business advantages," PGE suggests the Commission provide guidance related to the allowed use of the information in accordance with Sec. 3.2.d.

5. What should the evaluation report include and in what detail?

The evaluation report should include high-level analysis and information about the company's electric system that suggests why specific projects have been proposed. Furthermore, the report should identify specific areas of opportunity that the Company recognizes have potential for additional investments in storage. In the absence of the latter information, the Commission should require the utility to explain why it does not believe there are other potentially valuable areas of opportunity for storage on its system.

6. What process, if any, should we use for review and comment on the analysis results? For example, should the utilities prepare a draft report for stakeholder and Commission review and comment?

We encourage the Commission to provide utilities discretion on holding stakeholder workshops regarding their project proposals and evaluation reports, recognizing the value utilities typically find in such forums for vetting their ideas in advance of formal submission. We recommend the storage potential evaluation be filed as part of the project proposal, to allow review and comment to be handled concurrently with evaluation and the overall project proposal. We do not believe it is necessary or prudent, given the scope of HB 2193, to require draft reports for review and comment.

7. We recognize that the utilities may issue requests for information (RFIs) to test vendors and projects. Should the utilities report on the outcome of these RFIs? Should the results of such RFIs be included in the evaluation report?

PGE has already issued a RFI related to energy storage, but discourages the Commission from requiring reporting on the outcome in detail. PGE views RFIs as helpful instruments to determine market ability and interest in new technologies. Many of the respondents to an RFI consider their responses to be proprietary in nature and do not want them shared publicly; they often specify as much in their responses. The Company is concerned that reporting out on RFI responses could chill future participation in RFIs, and for that reason, would prefer to err on the side of limited public disclosure of specific responses. PGE, however, is open to reporting the general results of the RFIs, by describing, for example, how many firms responded, and what technologies were described.

8. If yes, what action, if any, should we take on the report?

Not applicable

Should the Commission consider setting guidelines for competitive bidding?

9. Should we establish guidelines for competitive bidding for storage projects?

PGE believes that it is premature for the Commission to establish guidelines for competitive bidding for storage projects as there is not yet an industry standard for evaluation of energy storage projects that is easily transferable to the Oregon utilities. The Commission may determine the value or importance of establishing competitive bidding guidelines in the context of approving utility proposals. Indeed, the scope of projects proposed may suggest that some warrant limited competitive bidding guidelines, while others warrant no guidelines at all.

Pursuant to HB 2193 and consistent with PGE's internal policy, we intend to issue a request for proposals for procurement of energy storage; additionally, we plan to include it in our Integrated Resource Planning (IRP) process in the future. Resource needs identified through the IRP will be acquired under the competitive bidding guidelines adopted in Order No. 06-446 and modified by Order No.14-149, assuming they meet the threshold criteria.

10. If yes, what guidelines should we prescribe? To what extent should the existing competitive bidding guidelines serve as the model?

Not applicable.

11. What role, if any, should we have in reviewing bid results?

We intend to use our existing Supply Chain policies to review proposals submitted under a future HB 2193-related RFP, and do not believe the OPUC should play an active role in reviewing bids. PGE however welcomes the opportunity to provide the OPUC with a summary report describing the RFP, a high-level overview of the bids, and the results of the RFP.

How should the Commission encourage diversity among projects?

12. How should we encourage investment in different systems?

The Commission should clearly articulate in its guidelines its desire for utilities to explore a variety of different project types to prepare for broader deployments of storage in the future. We believe the Commission should require utilities, at a minimum, to propose at least two different types of systems to meet the HB 2193 mandate.

PGE believes this approach is more appropriate and useful than predefining energy storage procurement targets for specific points of interconnection, such as those mandated by the California PUC[1]. A more flexible approach can still require the utilities demonstrate diversity in meeting their HB 2193 obligations, and can do so in a manner that respects—and leverages – utility knowledge of which specific issues would most benefit from closer examination through specific proposed projects. This approach would still retain the Commission's ability to require utilities to resubmit plans if they fail to sufficiently demonstrate diversity.

If the Commission wishes to be more specific, PGE notes that, at a high-level, there are four ways in which energy storage systems differ: technology, location on the grid, uses cases, and ownership structure. The Commission could require utilities to explain in their project proposals why they have proposed certain technologies, locations on the grid, use cases, or ownership structures and not others. Such an approach allows the Commission to encourage diversity – in both proposed and contemplated projects – without mandating outcomes.

13. Should we require utilities to submit proposals for multiple storage projects that test the use of storage in different applications, test different ownership structures, demonstrate promising new uses and technologies, or test some other critical differentiating factor among projects?

No, however we think it is appropriate for utilities to develop diverse proposals that test various hypotheses relevant to achieving the intended objectives of HB 2193, such as those described in the question. This may include pilots testing ownership structures, customer siting, new technologies, etc. The determination of which tests to propose, however, should be left to the utility's discretion.

14. What differences in storage projects should be promoted (e.g., different use cases, different technologies, different ownership structures)?

The Commission should encourage utilities to closely examine different use cases and technologies for all projects, and different ownership structures particularly for customer-sited projects. PGE, however, believes that HB 2193 is not an appropriate venue for examining different battery chemistries.

[1] CPUC, Decision Adopting Energy Storage Procurement Framework and Design Program in Rulemaking 10-12-007

Since the storage industry has matured significantly in the past five years and will continue to do so leading up to the procurement deadline, promoting different battery chemistries has limited value. PGE believes that such technology R&D is best left up to energy storage developers in an environment that does not directly impact customers or the distribution system's day-to-day operations. PGE draws a distinction, however, between battery chemistry and energy storage technology more broadly. Integral aspects of energy storage systems, such as inverters, do have emerging technology differences that may benefit from testing in the context of HB 2193.

15. To what extent should the goal be to test and prove new and innovative applications or technologies?

The goal should not be simply to test and prove new and innovative applications or technologies. PGE believes that the goal should be to successfully pilot a number of different energy storage projects to determine which, if any, when integrated into the system at scale can provide broad utility benefits. As such we meet the goal of identifying the project types that may be able to most cost-effectively scale and provide broad customer value in the future.

For example, one of storage's unique capabilities is its ability, when installed at a customer site, to increase the reliability of that customer's electric service, while providing additional benefits to the entire utility system. Energy storage installed on the utility's distribution system (e.g., a feeder) can provide the same benefits to the entire utility system, but not the same reliability benefits for a given customer. Customer-sited storage, however, may cost more per installed watt-hour than a larger installment on the distribution system. HB 2193 provides a unique venue for utilities in Oregon to determine to what extent, if any, there may be value in comparing the overall cost-effectiveness of customer-sited storage against storage installed at a feeder. HB 2193 also provides a venue for answering other questions related to storage that can help inform broader utility investments as the technology continues to mature and costs decline. Indeed, PGE believes that, in a sense, the goal of the project proposal is for the Company to explain which questions it intends to raise and why, and the goal of the projects themselves is to demonstrate the potential value of certain storage approaches if scaled.

What information should utilities include with a proposal?

16. What, if anything, should the guidelines add, clarify, or otherwise address as to these requirements?

PGE recommends that, in addition to the costs, benefits, and technical specifications specifically required under HB 2193, the guidelines should require utilities to include, to the extent practicable, the following costs:

capital costs, O & M costs, safety risks, technical/technology risks, financial risks (both project and vendor), system physical footprint, construction timeline, and the environmental impact of the storage system throughout its lifecycle

and benefits:

reliability, capacity; energy arbitrage; voltage control; frequency regulation; kVAr support and control; renewable integration; adaptive conservation voltage reduction; backup power for customers; spin/non-spin reserves; black start capability; transmission deferral; distribution deferral; learning opportunities; and environmental benefits (e.g., reduced emissions from regulated plants).

The description of the applicable benefits from storage projects should also include a discussion of how the identified benefits will be realized on the system. There should likewise be a discussion of how value streams are assumed to interact in operations (benefit stacking), such that a given storage system is able to deliver benefits from many different use cases throughout its lifecycle, though at a given instant gain value from only one use case.

17. What additional information should utilities provide with their proposals, and why?

The Company does not propose any additional information requirements at this time.

18. How should we calculate cost-effectiveness?

Cost-effectiveness should be assessed using benefit-cost ratios using identified cost and benefit streams identified in our response to Question 16. This evaluation will build on the methods proposed in PGE's white paper on the cost-effectiveness of demand response filed as part of UM 1708. There will of course be specifics to storage that are were not relevant in UM 1708 (for instance, benefits of ancillary services or reliability). Nonetheless, the overall approach of using a discounted cash-flow analysis from the four perspectives should remain the same.

19. How should the cost-effectiveness of a proposal be compared to other proposals and to traditional non-storage solutions?

Projects should be compared on the basis of both their Net Present Value (NPV) and their benefit-cost ratios. To appropriately encourage diversity, we recommend that projects on the distribution system (e.g., on a feeder; at or near a substation) be compared to other distribution system projects and that customer-sited projects be compared to other customer-sited projects. Methodologies to determine the cost-effectiveness through the Integrated Resource Planning process are under development.

20. What information and assessments should we require with a proposal to demonstrate the utility has conducted a full quantitative and qualitative assessment?

The following components at minimum should be included:

i. Engineering assessment demonstrating technical feasibility;
ii. Economic analysis of project cost-effectiveness, including NPV and benefit-cost ratio;
iii. Plan for evaluating ongoing system performance, and, if appropriate, customer satisfaction; and

iv. Analysis and explanation of why certain technologies, locations on the grid, use cases, and ownership structures have been proposed and others have not been.

How should the Commission evaluate proposals?

21. What criteria should we use to evaluate and compare projects? Should different criteria be used for different types of projects (e.g., should the criteria for evaluating and ranking a transmission investment deferral project be different than the criteria for evaluating a project that tests an emerging use or technology)?

The Commission should use four criteria to evaluate the portfolio of projects proposed by utilities: scalability, diversity, validated learning, and cost-effectiveness. The greatest weight should be given to projects that have the ability to cost-effectively scale over time. Diversity should also be heavily weighted, as should a portfolio that offers the promise of identifying solutions capable of providing long-term benefits, but that have not yet been tested in other parts of the country or that might provide particular benefits unique to utilities and customers in Oregon.

For all projects, the Commission should keep an eye towards the future, and evaluate not simply the cost-effectiveness of a given project when it is proposed, but rather its potential to provide greater value in the future as storage technology evolves.

22. Should we prioritize projects with immediate impacts, stress projects that hold promise of substantial benefits over the long-run, or seek a balance between projects serving different ends?

We believe HB 2193 provides an opportunity for the Commission to seek a balance between immediate impact and the potential of long-run benefits. Some use cases will have more immediate impact, while others are not likely to realize benefits for some time. In order to ensure a balance of use cases, it will be necessary to include both short-term and long-term benefits. Ideal projects may be able to both demonstrate an immediate impact to help solve a short-term issue while also containing the potential to deliver benefits over the long-term. Utilities should be encouraged to demonstrate how their proposals seek to address a combination of both short- and long-term issues.

23. Should we give greater weight to certain kinds of projects (say projects with a higher benefit-cost ratio) than to others?

We propose that the Commission should weigh the portfolio of proposals from a utility, as opposed to the individual projects. As stated in our response to Question 21, the portfolio should be reviewed according to the degree to which the projects within it incorporate scalability, diversity, validated learning, and cost-effectiveness in aggregate. The greatest weight should be given to projects that have the ability to cost-effectively scale over time. Diversity should also be heavily weighted, as should a portfolio that offers the promise of identify solutions capable of

providing long-term benefits, but that have not yet been tested in other parts of the country or that might provide particular benefits unique to utilities and customers in Oregon.

24. For a given use case, should we require utilities to evaluate alternatives to the use of storage?

PGE's approach to the economic evaluation of each energy storage use case will inherently involve consideration of the "shadow price" of the use case. In other words, the economic evaluation of the use case will consider an alternative way of meeting the use case – typically the conventional utility approach. Accordingly, requiring economic evaluation in the proposal automatically requires the consideration of alternatives, so an explicit requirement may not be needed.

25. How should we weigh non-quantifiable benefits?

The Commission should qualitatively weigh non-quantifiable benefits by requiring utilities to justify their inclusion of any given project in the proposals. Further, the Commission should weigh such benefits to the degree to which, in its expert judgement, it believes the utility is making a prudent use of resources to test a given location, technology, use case, or ownership structure through a project.