Davison Van Cleve PC
Attorneys at Law
TEL (503) 241-7242 ● FAX (503) 241-8160 ● jog@dvclaw.com
Suite 400
333 SW Taylor
Portland, OR 97204

December 1, 2017

Via Electronic Filing

Public Utility Commission of Oregon
Attn: Filing Center
201 High St. SE, Suite 100
Salem OR 97301

Re: In the Matter of PORTLAND GENERAL ELECTRIC CO.
2016 Integrated Resource Plan
Docket No. LC 66

Dear Filing Center:

Please find enclosed the Comments of the Industrial Customers of Northwest Utilities ("ICNU") on PGE's Revised Renewable Action Plan in the above-referenced docket. Also enclosed are the Comments of Bradley G. Mullins on behalf of ICNU, along with Attachments A – C thereto.

Thank you for your assistance. If you have any questions, please do not hesitate to call.

Sincerely,

/s/ Jesse O. Gorsuch
Jesse O. Gorsuch

Enclosures

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

LC 66

In the Matter of PORTLAND GENERAL ELECTRIC COMPANY 2016 Integrated Resource Plan.	)))))))	COMMENTS OF THE INDUSTRIAL CUSTOMERS OF NORTHWEST UTILITIES

I. INTRODUCTION

Pursuant to the Administrative Law Judge's November 15, 2017 Ruling, the Industrial Customers of Northwest Utilities ("ICNU") files these Comments on Portland General Electric Company's ("PGE" or the "Company") Revised Renewable Action Plan. ICNU recommends that the Commission decline to acknowledge the Company's revised action plan. If the Commission is to acknowledge anything, it should, at most, acknowledge only the issuance of a request for proposals ("RFP").

In its acknowledgement order on PGE's Integrated Resource Plan ("IRP"), the Commission noted that the Company's renewable action plan, in which it would seek to acquire 175 aMW of resources eligible for compliance with Oregon's renewable portfolio standard ("RPS") in the near term to meet RPS obligations that do not arise until a decade or more in the future, "stretched the boundaries of our accustomed IRP process."[1/] That was so largely because PGE proposed a resource acquisition based on economic considerations rather need – acquiring

[1/] Docket No. LC 66, Order No. 17-386 at 1 (Oct. 9, 2017).

DAVISON VAN CLEVE, P.C.
333 S.W. Taylor, Suite 400
Portland, OR 97204
Telephone: (503) 241-7242

new RPS resources in the near term, when tax credits are available, will be cheaper than acquiring them later when PGE has a true need for such resources, the Company alleged.

Fundamentally, the IRP process is designed to identify how a utility can best meet its *need* for new resources, either for reliability or regulatory purposes, with the best combination of cost and risk. Acquiring resources purely for economic reasons (which are, by nature, speculative) is the province of independent power producers, not regulated utilities.

Nevertheless, it is the case, as the Commission recognized, that as the law exists today PGE will have a need for new RPS-compliant resources in the future. Acquiring those resources now could be cheaper than acquiring them later, but no one knows this for sure. The Commission summarizes well the complex challenges and tradeoffs between long-term system planning in the current environment without losing sight of near-term risks and cost impacts:

> How utilities characterize need and assess risk and uncertainty within their IRPs and how we integrate that analysis into our review, however, must evolve. Traditional resource strategies, and the Commission's past treatment of such strategies, may have less relevance as utilities undergo system transformation in a time of evolving regulatory change, rapid technological advancements, increasing customer options, and market uncertainty. In this time of transition, we challenge utilities and stakeholders not to view our IRP guidelines as pre-established checklists but rather to proactively adapt their assessment of risk and uncertainty as industry evolution comes into greater focus.[2/]

While PGE reframed its analysis in some respects in its revised action plan, ultimately the Company fails to meet the Commission's challenge. It still requests acknowledgement of a specified amount of new resources without demonstrating a need or an economic justification for this amount. Its proposed cost-containment screen is opaque and is insufficient to demonstrate

---

[2/] Id. at 14.

DAVISON VAN CLEVE, P.C.
333 S.W. Taylor, Suite 400
Portland, OR 97204
Telephone: (503) 241-7242

that near-term customers will realize economic benefits relative to alternative resources that provide energy and capacity.

PGE's revised action plan still appears designed primarily to ensure the greatest up-front assurance of cost recovery possible. This is particularly problematic when one considers that the case for near-term action is becoming less compelling, not more. As Bradley Mullins discusses, the current federal tax reform package would effectively kill the benefits of the production tax credit ("PTC") and increase the cost impacts of PTC-carryforwards on customers. The Company is also becoming more resource sufficient with respect to RPS compliance, not less, particularly if one assumes PGE will purchase unbundled RECs to meet a portion of its compliance obligations, as it has *always* done.

The Company's approach is also problematic because it does not acknowledge the Commission's reminder that "we do not control PGE's resource decisions and [] risks associated with such actions must be properly balanced between shareholders and customers."[3/] Requiring PGE to assume some risk of cost-recovery is even more important when the proposed resource acquisition is being made for economic reasons rather than ones of need. Ultimately, this is a discretionary decision that will not assure benefits to customers. When a utility procures a resource to fill a need (be it reliability or regulatory), that resource may prove with hindsight to have been a more expensive resource it otherwise could have acquired, but it still had to acquire *something*. So long as it acted reasonably at the time, the utility is adjudged to have acted prudently. That is not the case here where the only justification for near-term action is cost savings. To acknowledge a specific acquisition (i.e., 100 aMW of new renewables) under these

[3/] Id. at 2.

DAVISON VAN CLEVE, P.C.
333 S.W. Taylor, Suite 400
Portland, OR 97204
Telephone: (503) 241-7242

circumstances is effectively to acknowledge that it is reasonable to assume that such acquisition will provide economic benefits to customers. The Commission cannot possibly know this today.

By repeatedly refusing to recognize this fact, PGE has effectively taken the position that it will not act to procure new resources without the Commission's say-so first. That position is antithetical to the Commission's acknowledgement order in this docket that pushes stakeholders and PGE toward a more flexible and dynamic procurement process. It is also imprudent.

It is simply impossible for the Commission to say at this time whether procuring any new renewable resources in the near term – let alone 100 aMW – is reasonable given (1) the uncertainties associated with tax reform, (2) the lack of any knowledge of the resources that will bid into an RFP, (3) an ongoing bilateral negotiation process for capacity resources, and (4) what market prices will look like at the time of procurement. PGE cannot insist that the Commission provide it with the cost recovery assurances it is requesting through its revised action plan under these circumstances.

Rather, ICNU continues to believe that the prudent course of action is to wait to procure new resources until there is a more compelling showing of need. But as an alternative to waiting, there is only one action that is potentially reasonable at this time – issuing an RFP. It is possible that there are resources PGE could acquire that would provide a cost-effective means of providing energy and capacity while also making incremental progress toward meeting future RPS requirements. How much, if any, of such resources it makes sense to acquire remains to be seen.

DAVISON VAN CLEVE, P.C.
333 S.W. Taylor, Suite 400
Portland, OR 97204
Telephone: (503) 241-7242

II. COMMENTS

Under the Commission's IRP guidelines, acknowledgement of an action plan item signifies that it is "reasonable based on information available at that time."[4] To determine whether PGE's revised renewable action plan should be acknowledged, then, it is, of course, important to understand what PGE is requesting acknowledgement of. As ICNU interprets its revised RPS action plan, PGE is requesting acknowledgement of the following:

- Acquisition of 100 aMWs of new RPS resources;
- The cost-containment screen as proposed;
- The proposal to return the value of RECs to customers prior to 2025.

Based on the information available today, PGE has not demonstrated any of these proposals to be reasonable.

A. Resource Size

As with its initial proposal to acquire 175 aMW, PGE has not provided any reasoned basis for now selecting 100 aMW. One reason it gives is that 100 aMW will provide near-term energy and capacity.[5] This is undoubtedly true, but so would any amount of renewable resources. The Company identifies a near-term capacity need of 461 MW in 2021, rising to 761 MW in 2025.[6] But this is before any capacity additions acquired through its bilateral negotiation process, and any contribution to capacity a renewables procurement provides will depend upon the resource. Similarly, the Company identifies an energy need of 75

---

[4] PGE 2013 IRP, Docket No. LC 56, Order No. 14-415 at 1 (Dec. 2, 2014); PGE 2016 IRP, Docket No. LC 66, Order No. 17-386 at 4.
[5] PGE Revised Renewable Action Plan at 15-16.
[6] Id. at 15.

DAVISON VAN CLEVE, P.C.
333 S.W. Taylor, Suite 400
Portland, OR 97204
Telephone: (503) 241-7242

aMW in 2021, rising to 263 aMW in 2025.[7/] Again, this is before any capacity additions from the bilateral negotiation process, which could provide energy as well. Additionally, there is no clear rationale from this energy need for selecting 100 aMW as opposed to any other amount. Ultimately, it does not matter whether 100 aMW can meet a portion of PGE's near-term energy needs, it only matters whether it could meet those needs *cost-effectively*. ICNU addresses this issue below with respect to the cost-containment screen.

PGE also justifies acquiring 100 aMW because this amount represents an incremental step toward its future RPS obligations.[8/] But so does 50 aMWs, or 75 aMWs, or, indeed, even 175 aMWs. The Company also notes that 100 aMWs "corresponds to the Blended Glide Path in the 2025 time frame."[9/] Importantly, however, none of the glide paths the Company developed assumed that it would purchase any unbundled RECs in future years, an assumption that materially increases its projected future need. ICNU continues to strongly disagree with the Company's approach with respect to unbundled RECs as it is almost certain to result in PGE overinvesting in physical resources to meet the RPS. Mr. Mullins shows that, based on current information, PGE can push out its need for physical RPS resources until 2037 by utilizing unbundled RECs.

Finally, PGE also illustrates in figures 3 through 6 what its REC bank would look like under various scenarios with a 100 aMW near-term procurement.[10/] But this tells the

---

7/ Id.
8/ Id. at 18-22.
9/ Id. at 19.
10/ Id. at 20-22.

DAVISON VAN CLEVE, P.C.
333 S.W. Taylor, Suite 400
Portland, OR 97204
Telephone: (503) 241-7242

Commission essentially nothing. Knowing that procuring 100 aMWs of new RPS resources in 2025 would make PGE RPS compliant until 2034 does not provide a basis for that 100 aMWs.

Ultimately, there is no particular amount that PGE could demonstrate to be any more reasonable than any other amount. That is because the amount it would be reasonable to acquire depends upon the economics of the resources that are available for acquisition. If the economics are favorable enough relative to alternatives, it may be reasonable for PGE to acquire 200 aMW of new renewable resources in the near term. Or there may only be 56.5 aMW of such resources available. Or it is possible that no renewable resources are economic relative to other sources of energy and capacity, in which case the reasonable decision is to acquire nothing.

There is nothing inherent to the IRP guidelines or the RFP process that necessitates the acknowledgement of a particular amount of a resource to acquire. Normally a utility proposes a discrete amount because that is the amount it needs – for instance, to meet reliability or regulatory requirements. In proposing to acquire a resource for economic reasons, though, the justification for proposing a particular amount falls away. When PacifiCorp issued an RFP for renewable resources in 2016 – also an RFP pursued for economic reasons – it set a 3 MW minimum, but no maximum amount.[11/] While PacifiCorp did not seek Commission acknowledgement of this RFP, it demonstrates that issuing an RFP for a specified amount of a resource is not necessary to attract bidders.[12/]

[11/] PacifiCorp 2016R Renewable Resource RFP at 1 (Apr. 11, 2016), *available at*: http://www.pacificorp.com/content/dam/pacificorp/doc/Suppliers/RFPs/2016RenewablesRFP/RFP_2016R_MAIN_DOCUMENT.pdf.

[12/] Also, notably, through that RFP PacifiCorp determined that it was cheaper to purchase RECs than physical resources.

DAVISON VAN CLEVE, P.C.
333 S.W. Taylor, Suite 400
Portland, OR 97204
Telephone: (503) 241-7242

Requesting acknowledgement of an RFP to acquire 100 aMW puts the Commission in the position of declaring this amount to be reasonable when it could not possibly have the information available to it to make this decision.

B. Cost-Containment Screen

PGE also proposes to implement a cost-containment screen to prevent acquisition of a resource that has "above-market costs." ICNU considers the Company's proposed cost-containment screen to be flawed in a number of ways, including those Mr. Mullins discusses.

Most importantly, the screen does not compare a renewable resource that bids into the RFP with alternative resources that are actually available to the Company to meet its energy and/or capacity needs. Rather, the Company proposes to model the projected levelized value of a resource's capacity (using RECAP) and energy (using AURORA) and compare those values to the resource's levelized cost.[13/]

One issue with this proposal is that it is impossible to know what the cost-containment screen will be because it is uniquely applied to each resource that bids into the RFP based on that resource's particular characteristics.[14/] Thus, PGE cannot demonstrate that application of this screen would produce reasonable results.

Another issue is that the cost-containment screen does not ensure that PGE is selecting the least-cost resources to meet its energy and capacity needs – it simply ensures that the cost of such resources is less than a modeled value they provide. But if PGE can meet its energy and capacity needs through, for instance, market purchases that would be cheaper than

13/ PGE Revised Renewable Action Plan at 12-13.
14/ Id. at 12.

DAVISON VAN CLEVE, P.C.
333 S.W. Taylor, Suite 400
Portland, OR 97204
Telephone: (503) 241-7242

the cost of renewable resources, then what difference does it make that these renewable resources passed the cost-containment screen? They are still more expensive than existing alternative resources.

The Company's example of its cost-containment screen illustrates this problem. It shows that a generic wind resource from its IRP would pass the cost-containment screen if priced anywhere below $54.26/MWh. This is an absurdly high number compared to current market prices. Recall that just seven months ago, PGE filed to update its avoided costs and claimed that its renewable avoided costs in Schedule 201 were well above its true avoided costs.[15/] ICNU supported PGE's filing because it agreed that the rates the Company was required to pay qualifying facilities ("QFs") were far above the going rate, which had the potential to harm customers by increasing their power costs.[16/] At that time, PGE's renewable avoided costs for a wind QF were in the $50-$70 range at the start of the resource deficiency period, comparable to the price screen that would apply to a generic resource under the Company's cost-containment screen.[17/] If PGE is hesitant to pay these prices to third-parties (as it should be), it is unclear why it would be comfortable acquiring similar resources through an RFP.

Meanwhile, today, following the Commission's acknowledgement order in this docket, the Company's near-term renewable avoided cost prices for a wind QF are in the $20 and $30 ranges.[18/] Yet, it would acquire a new wind resource through its proposed RFP at a levelized

[15/] Docket No. UM 1728, PGE Application to Update Schedule 201 Qualifying Facility Information (May 1, 2017).
[16/] Docket No. UM 1728, ICNU Comments (May 9, 2017).
[17/] Docket No. UM 1728, PGE Application to Update Schedule 201 Qualifying Facility Information, Sheets 201-15 & 201-16.
[18/] PGE Schedule 201, Sheet Nos. 201-14 & 201-15.

DAVISON VAN CLEVE, P.C.
333 S.W. Taylor, Suite 400
Portland, OR 97204
Telephone: (503) 241-7242

cost potentially over $50/MWh. That is not an economic resource for meeting near-term capacity and energy needs.

C. Returning REC Value to Customers

Finally, PGE proposes to return the value of RECs to customers between 2020 and 2025 to further reduce the cost of the resource. ICNU does not necessarily object to this approach, but it is difficult to see how it could be determined to be reasonable at this time. The Company itself states that "[g]iven uncertainties in REC markets and future policies, the Company recommends that the specific mechanism for returning value to customers be considered at a future time within a separate docket."[19/] If selling RECs makes sense for customers, then PGE should do it as a simple matter of good utility practice. It does not need, and should not request, the Commission's pre-authorization.[20/]

D. ICNU's Alternative Proposal

Given the issues identified above, the Commission would be justified in once again declining to acknowledge the Company's revised renewable action plan. That is ICNU's preferred outcome given the lack of any need for renewable resources at this time and the Company's failure to demonstrate that its revised action plan is reasonable based on what is known today.

However, if the Commission determines that it is important for the Company to see if there are resources available that can provide economic benefits to customers, then ICNU

19/ PGE Revised Renewable Action Plan at 14.

20/ PGE does suggest selling RECs directly to customers through a voluntary renewable energy tariff-type program. The Commission recently reviewed such a program and approved it subject to conditions that ultimately were unacceptable to PGE. Docket No. UM 1690, PGE Response to Commission Order No. 15-405 (Apr. 14, 2016). ICNU does not oppose revisiting this program if the Commission determines that it is in the public interest to do so.

DAVISON VAN CLEVE, P.C.
333 S.W. Taylor, Suite 400
Portland, OR 97204
Telephone: (503) 241-7242

recommends that the Commission acknowledge the issuance of an RFP for renewable resources, but to decline to acknowledge a particular amount (other than potentially a cap and/or a minimum) and to decline to acknowledge the Company's proposed cost-containment screen, and make clear that the Commission is not necessarily acknowledging the acquisition of any resources through the RFP.

Additionally, as discussed above, without a discrete need for the type of resources the Company proposes to acquire, the costs of those resources should be compared against the cost of other available resources that could just as easily meet this need. They should not be compared to a hypothetical modeled "value to the system" those resources might provide. If, following its bilateral negotiation process, PGE continues to have an energy and/or capacity need, then it can meet that need with market purchases. If the cost of these purchases would be less than the cost of resources bid into the RFP, then the prudent action likely is to buy from the market.

ICNU does not propose that the Commission acknowledge any particular methodology for determining a resource's cost-effectiveness. PGE should have the flexibility to select whatever methodology it considers to be appropriate, recognizing that "resource investment decisions [] ultimately[] rest firmly with the company."[21/] ICNU does, however, recommend that whatever methodology the Company uses should emphasize near-term costs. Levelizing resource costs has the potential to result in the selection of resources that are not cost-competitive in the near term but cheaper over the long term. Such resources would not address the intergenerational inequity concerns raised in response to the Company's original action plan.

21/ Order No. 17-386 at 2.

DAVISON VAN CLEVE, P.C.
333 S.W. Taylor, Suite 400
Portland, OR 97204
Telephone: (503) 241-7242

Ultimately, parties should have the ability to review the Company's methodology for comparing costs when it requests recovery of its costs in rates.

III. CONCLUSION

For the foregoing reasons, ICNU recommends that the Commission not acknowledge the Company's Revised Renewable Resource Action Plan. If the Commission is to acknowledge anything, it should be only the issuance of an RFP. No other action can be determined to be reasonable at this time.

Dated this 1st day of December, 2017.

Respectfully submitted,

DAVISON VAN CLEVE, P.C.

/s/ Tyler C. Pepple
Tyler C. Pepple
333 S.W. Taylor, Suite 400
Portland, Oregon 97204
(503) 241-7242 (phone)
(503) 241-8160 (facsimile)
tcp@dvclaw.com
Of Attorneys for the Industrial Customers of
Northwest Utilities

BRADLEY G. MULLINS

Consultant, Energy & Utilities

333 SW Taylor Street, Suite 400
Portland, Oregon 97204
Phone +1 (503) 954-2852
brmullins@mwanalytics.com

December 1, 2017

Oregon Public Utility Commission
Chair Lisa Hardie
Commissioner Stephen Bloom
Commissioner Megan Decker
201 High St SE, Suite 100
Salem, Oregon 97301

Re: LC 66 - Comments on behalf of ICNU on the 2016 Revised Renewable Action Plan of Portland General Electric Company

Dear Commissioners:

I appreciate the opportunity to provide comments on behalf of the Industrial Customers of Northwest Utilities ("ICNU") on the Revised Renewable Action Plan to the 2016 Integrated Resource Plan ("IRP") of Portland General Electric Company ("PGE" or the "Company"). ICNU is a non-profit trade association representing large electric utility customers located throughout the Northwest, including customers of PGE. Tyler Pepple of Davison Van Cleve will also be providing Final Comments on behalf of ICNU in this matter.

In summary, I recommend the Commission not acknowledge PGE's Revised Renewable Action Plan. While the Revised Renewable Action Plan has proposed to pursue a reduced amount of renewable resource capacity of approximately 294 MW, in contrast to the 515 MW included in PGE's 2016 IRP, PGE's revised analysis fails to address the major risks associated with such a large investment. In fact, I view the Cost Containment Screening process described in the Revised Renewable Action Plan to be a step backwards from what was already an insufficient analysis presented in the 2017 IRP. The inadequacies of PGE's analysis are particularly evident when one considers the speculative tax benefits that PGE relies on to justify its proposal. Simply put, the analysis PGE performed in the Revised Renewable Action Plan is not sufficient for the Commission to acknowledge a request for proposal ("RFP") for such a major resource addition.

1. PGE Does Not Have an RPS Need Until 2037

In Attachment A, I have updated my analysis of PGE's renewable portfolio standard ("RPS") compliance requirements through 2040. That analysis shows that PGE does not have a need for physical RPS compliance until 2037.

In contrast, on page 15, Table 3 of the Revised Renewable Action Plan, PGE suggests that it has a physical RPS need beginning in 2025 of 71 aMW. That timeframe, however, misrepresents the true timing of when PGE will need to construct a long-lived resource in order to comply with the RPS requirements and is based on a number of flawed assumptions.

First, the data presented in Table 3 in the Revised Renewable Action Plan does not correspond to the timing presented in the workpapers underlying PGE's proposal. In response to ICNU Data Request ("DR") 52, PGE provided workpapers underlying the tables and figures in its Revised Renewable Action Plan. In those workpapers, PGE reports that it does not have an RPS shortage until 2032, approximately seven years later than PGE represented in Table 3.

Second, PGE's analysis ignores its ability to utilize unbundled renewable energy certificates ("RECs") to fill up to 20% of its RPS resource requirements. This is an issue that ICNU has raised repeatedly, yet PGE continues to disregard this important aspect of Oregon's RPS requirements.

It is not surprising that PGE would prefer to construct a long-lived asset, over using RECs to meet compliance obligations, since PGE will recognize financial benefits if the proposed wind facilities are constructed. It has been widely documented that utilities subject to rate of return regulation have an incentive to over-invest in capital in order to increase earnings.[1/] This phenomenon is often referred to as the Averch-Johnson Effect—based on the economists who first developed the model to describe it back in the 1960s—and has a real and significant impact on how utility operations are managed. As the saying goes, the utility earns on what it builds. Accordingly, when considering the capital investments PGE proposes, it is important to recognize that PGE's shareholders have the potential to benefit hugely if the capital is deployed.

In addition, the shareholder benefits associated with the capital investment accrue irrespective of whether the alleged ratepayer benefits materialize. Thus, when considering the proposed capital investment, there is a fundamental asymmetry in that ratepayers bear all of the risks associated with the investment, while shareholders receive financial benefits that are practically guaranteed from a ratemaking perspective. This disparity is exacerbated when one considers that PGE bears no risk of regulatory lag associated with renewable resource investments, as it is

---

1/ See Harvey Averch & Leland L. Johnson, *Behavior of the Firm Under Regulatory Constraint*, 52 AM. ECON. REV. 996, 1052 (1962).

allowed to begin recovering its investment in these resources immediately through its Renewable Resources Automatic Adjustment Clause tariff (Schedule 122).

Relying on unbundled RECs, on the other hand, does not require the utility to deploy capital, and for that reason, using RECs is less risky from a ratepayer perspective.

Arguments that REC markets are illiquid, or somehow inaccessible in the long term, are also unfounded. In fact, those arguments are contrary to the way that REC markets have developed over the years. REC markets are bilateral, and unlike bilateral power markets, there are no reporting services documenting the pricing for REC transactions. That does not mean, however, that the REC markets are unreliable or inaccessible. In fact, the problem with REC markets recently has not been that the market is illiquid. The problem has been that the supply of RECs in the market is too great relative to demand, driving down prices to very low levels. From a ratepayer perspective, this excess supply, which PGE has previously represented as being indicative of illiquidity, is further reason to rely on RECs, rather than constructing long-lived resources.

A third flaw in PGE's analysis of its RPS resource needs has to do with the treatment of qualifying facility ("QF") resources. In PGE's analysis, it assumes that, when a QF contract reaches the end of its term, the QF resource will not be renewed, and that the resource will simply go away. Accordingly, around 2030 PGE assumes a large volume of renewable QF resources will be eliminated from its system, which accelerates its purported RPS resource need.

Based on past experience, however, most QF contracts do end up being renewed at the end of the contract term. For the most part, QF resources do not have many options other than selling to the host utility. In fact, that is one of the reasons that the qualifying facilities portion of the Public Utility Regulatory Policy Act was enacted—to provide these independent power producers with an opportunity to sell to a utility at the utility's incremental cost.

Accordingly, I view it to be more reasonable to assume that executed QF contracts will be renewed or subjected to a new contract at the time of expiry, an assumption which I have made when calculating the 2037 RPS resource need in Attachment A. Making this assumption has the effect of extending PGE's RPS resource need by several years.

Similarly, I disagree with PGE's allegation that it will ultimately have a smaller quantity of QF capacity installed on its system than the quantity associated with currently executed contracts. PGE applies a QF success rate to try to quantify the notion that many QF resources do not reach commercial operation after the contract has been signed.

While it may be true that many signed QF contracts have not reached commercial operation in the past, one expects that many new contracts will be executed in the upcoming years, adding to PGE's ability to meet its RPS compliance obligations. In fact, over the long period leading up to the Company's 2037 RPS resource need, I expect that even greater levels of QF development will occur, which will likely further delay PGE's RPS resource need for several years.

Based on my analysis, PGE's proposal to acquire a renewable resource in 2021 would result in the acquisition of an RPS resource approximately 17 years prior to the time when RPS resources are needed for RPS compliance. Building long-lived assets prior to the time that they are needed to provide electrical services is an inherently risky strategy that is fundamentally unfair to ratepayers. Accordingly, I continue to view a Just-in-Time ("JIT") strategy, with reliance on unbundled RECs up to the statutory maximum level of 20%, to be a more prudent, and less risky, way to plan for RPS compliance.

2. Tax Reform Would Further Diminish the Economic Case for Early Action

Other than a footnote in the Revised Renewable Action Plan, PGE makes no mention of the possibility of tax reform, and the implications on its strategy of taking advantage of production tax credits. The possibility of tax reform, however, represents material, and known, risk associated with the proposed investment, yet PGE appears not to have conducted any analysis to consider the impacts of tax reform on its proposal.

As the Commission is aware in the context of PacifiCorp's IRP, the implications of tax reform are a major risk associated with a constructing renewable resources in order to take advantage of the economics of expiring production tax credits.

Provisions in the current Senate Bill would reduce marginal corporate tax rates from 35% to 20%. With respect to PGE's resource proposal, reducing the corporate tax rate will have the effect of reducing the revenue requirement impact of production tax credits. It will also diminish the impact of other tax benefits associated with the renewable resource addition, such as the benefit of bonus and accelerated depreciation. As the tax rate declines, the benefit of being able to deduct depreciation expense in an accelerated manner also declines. These impacts have been documented in the case of PacifiCorp's IRP, although PGE appears to have made no effort to quantify the impact of these potential changes on its proposal. As also documented with PacifiCorp, there are also provisions in the current Senate Bill that would eliminate inflationary escalation on the production tax credit rate

In addition, the impact of tax reform will be materially greater for PGE than for PacifiCorp, since the reduced tax rates will also further diminish PGE's ability to utilize production tax credits on its tax return. In previous comments, ICNU has noted that PGE is already in a position where it is unable to utilize all of the production tax credits that it generates on its tax return. The inability of PGE to utilize production tax credits has historically been a cost to ratepayers, as PGE has included the carryforward balance of unutilized tax credits in rate base.

ICNU has been very concerned that the addition of a new wind resource would cause PGE's tax credit carryforward balance to grow in an uncontrolled manner, and thus result in the imposition of a great deal of unnecessary costs on ratepayers. If the corporate tax rate is reduced, however, the problems associated with production tax credit carryforwards will only be exacerbated, since PGE would have less tax liability that it may offset with production tax credits.

Additionally, there are further provisions in the current legislative drafts which will have the effect of further limiting the ability of utilities to utilize production tax credits.[2/] With the exception of research and development tax credits, the Senate Bill would impose a minimum tax equal to 10% of taxable income, meaning that production tax credits would only be eligible to offset 90% of taxable income.

Taking all of this into consideration, the draft legislation would have the effect of severely limiting PGE's ability to utilize production tax credits. In Attachment B, I have updated my forecast of PGE's ability to utilize production tax credits, which has been presented in previous phases of this matter.

Absent tax reform, my forecast indicates that a new 100 aMW wind resource will result in costs to ratepayers of approximately $84.1 million on a net present value revenue requirement ("NPVRR") basis in connection with the cost of production tax credit carryforwards.

If tax reform is approved, however, the ratepayer cost associated with the incremental tax credit carryforward balances will skyrocket. I estimate that the ratepayer costs associated with PGE's inability to utilize production tax credits on its tax return grows to approximately $164.3 million on an NPVRR basis if tax reform is enacted.

In its previous filing, PGE has noted that it is difficult to forecast taxable income, and the cost of production tax credit carryforwards. That does not mean, however, that those costs should be disregarded, as PGE has repeatedly done in its various proposals to construct a new renewable resource and as PGE has done in its Revised Renewable Action Plan. My analysis relies on the level of production tax credit carryforwards assumed in PGE's most recent general rate case, and assumes that the tax credit utilization calculated in that matter will continue in the future. I used a 4.1% discount rate, which is the same discount rate that PGE appears to have used in developing its analysis in this matter, although I would note that it probably would have been more appropriate for PGE to use a higher discount rate corresponding to its cost of capital.

[2/] See https://www.utilitydive.com/news/last-minute-provision-in-senate-tax-bill-could-devastate-renewable-energy/511923/

3. The "Cost-Containment Screen" Process is Not a Reasonable Replacement for a Rigorous IRP Process

As a part of PGE's Revised Renewable Action Plan, it develops a concept it refers to as "Cost-Containment Screens." The purpose of this process is somewhat ambiguous, and not fully developed to the point where it might be considered by the Commission.

Effectively, rather than determining whether a resource need has been established in the IRP, PGE proposes to use an avoided cost analysis in order to determine whether it should construct a renewable resource. Its analysis would compare the levelized cost of the proposed wind resources to the avoided cost of energy and capacity over some long-term period of time. If the levelized cost of the proposed resource is less than PGE's avoided costs, PGE will acquire the resource. If not, PGE will not acquire the resource—or at least, that is my understanding from the sparse descriptions PGE provided.

In the Revised Renewable Action Plan, there are many uncertainties about how this analysis will be performed. For example, PGE did not identify the time frame over which the analysis would be performed or how it would compare resources with differing lives. In response to ICNU DR 50, included as Attachment C to these comments, PGE confirmed that the analysis would be performed over the life of the resource being evaluated. It is not clear, however, how the Company would compare resources with differing lives, such as comparing the cost of a front-office transaction executed for a one-year period to the cost of a 35-year wind plant.

The time period of the analysis is important, because the further out in time the calculation is performed, the greater amount of risk is involved from a ratepayer perspective. There is little risk to PGE in relying on this sort of analysis, however, as it will be given the opportunity to earn returns on its investment irrespective of whether the resource is ultimately economic relative to future market prices.

The Commission may recall that, in the gas hedging portion of PGE's 2016 Annual Update Tariff proceeding, I demonstrated empirically that PGE's market forecasts tended to overestimate market prices, and that the magnitude of the overestimation tended to be greater the further out the forecast was made.

While there should be little expectation that anyone can predict future market prices with any degree of accuracy, particularly as far as 20 or 30 years into the future, the significant inaccuracy of PGE's past projections provides a convincing case of why it would be speculative to make investments based on those projections, as PGE proposes by comparing the proposed wind resource against an avoided cost calculation in its Cost-Containment Screening process.

It is true that the IRP framework also relies on long-term price forecasts. Notwithstanding, when a project is constructed to meet a demonstrated reliability need in the IRP, the accuracy of the long-term price forecast is less important. When a reliability need has been demonstrated, a resource must be acquired irrespective of whether it is economic from an avoided cost perspective to do so. The price forecast may influence which specific types of resource will be selected, but not whether a resource should be acquired at all. Thus, the accuracy of forward price curves is of greater importance in the case of an investment driven by economic factors.

In addition, since the IRP process is designed to identify the best resource to fill an identified resource need, it can and does ignore many of the risks associated with acquiring new resources. When a resource is necessary from a reliability or supply perspective, many risks must be assumed without regard to the resource acquired.

When considering the time period over which to perform the Cost-Containment Screening process, a more practical approach would be to use front-office transactions as the bench market resource. In this approach, rather than comparing the levelized cost of the wind resource to speculative market prices extending 35 years into the future, the levelized cost of the wind resource is be compared against current market prices, over a one-year period. I would support this sort of approach, as it would acknowledge ICNU's longstanding position that the front-office transactions should be used to the fullest extent possible, prior to making decisions to acquire risky, long-lived assets.

4. Conclusion

I appreciate the opportunity to provide these comments on behalf of ICNU. I remain concerned that there are still fundamental questions that must be considered before making irreversible decisions to acquire 294 MW of wind resources. Accordingly, I recommend that the Commission not acknowledge PGE's Revised Renewable Action Plan.

Sincerely,

/s/ Bradley Mullins

Bradley Mullins
Consultant, Energy & Utilities
333 SW Taylor Street, Suite 400
Portland, Oregon 97204

ATTACHMENT A (Page 1 of 2)
SCHEDULE OF FORECAST RENEWABLE ENERGY CERTIFICATE ("REC") BALANCES, JIT RESOURCE ACQUISITION
Assuming unbundled RECs are used for compliance
Average-Megawatts

Year	Beg. Bank (a) = (d)[n-1]	RECs From Exist. Resrcs. (b)	Qualifying Facilities (c)	Unbundled RECs (d)	New Resrcs. (e)	RPS Req. (f)	Ending Bank (g) = ∑ (a):(e) - (f)	
2018	935	338	-	59		295	1,037	
2019	1,037	338	-	59		296	1,138	
2020	1,138	338	153	80		398	1,311	
2021	1,311	339	153	80		401	1,482	
2022	1,482	339	153	81		405	1,650	
2023	1,650	339	153	82		409	1,814	
2024	1,814	339	153	83		414	1,975	
2025	1,975	339	153	113		564	2,015	
2026	2,015	339	153	114		570	2,052	
2027	2,052	339	153	115		576	2,083	
2028	2,083	337	153	116		582	2,108	
2029	2,108	330	153	118		588	2,121	
2030	2,121	330	153	154		770	1,988	
2031	1,988	363	153	156		778	1,881	
2032	1,881	334	153	157		786	1,738	
2033	1,738	330	153	159		794	1,586	
2034	1,586	330	153	161	-	803	1,427	
2035	1,427	330	153	209	-	1,043	1,075	
2036	1,075	330	153	211	-	1,054	714	
2037	*714*	*330*	*153*	*213*	*350*	*1,066*	*695*	*Resource Need*
2038	695	330	153	215	350	1,077	666	*Deficit Year*
2039	666	330	153	218	350	1,089	627	
2040	627	330	153	245	350	1,223	482	

ATTACHMENT A (Page 2 of 2)
SCHEDULE OF FORECAST RENEWABLE ENERGY CERTIFICATE ("REC") BALANCES, JIT RESOURCE ACQUISITION
Assuming unbundled RECs are used for compliance
Average-Megawatts

Year	Beg. Bank (a) = (d)[n-1]	RECs From Exist. Resrcs. (b)	Qualifying Facilities (c)	Unbundled RECs (d)	New Resrcs. (e)	RPS Req. (f)	Ending Bank (g) = ∑ (a):(e) - (f)
2018	935	338	-	59		295	1,037
2019	1,037	338	-	59		296	1,138
2020	1,138	338	153	80	100	398	1,411
2021	1,411	339	153	80	100	401	1,682
2022	1,682	339	153	81	100	405	1,950
2023	1,950	339	153	82	100	409	2,214
2024	2,214	339	153	83	100	414	2,475
2025	2,475	339	153	113	100	564	2,615
2026	2,615	339	153	114	100	570	2,752
2027	2,752	339	153	115	100	576	2,883
2028	2,883	337	153	116	100	582	3,008
2029	3,008	330	153	118	100	588	3,121
2030	3,121	330	153	154	100	770	3,088
2031	3,088	363	153	156	100	778	3,081
2032	3,081	334	153	157	100	786	3,038
2033	3,038	330	153	159	100	794	2,986
2034	2,986	330	153	161	100	803	2,927
2035	2,927	330	153	209	100	1,043	2,675
2036	2,675	330	153	211	100	1,054	2,414
2037	2,414	330	153	213	100	1,066	2,145
2038	2,145	330	153	215	100	1,077	1,866
2039	1,866	330	153	218	100	1,089	1,577
2040	1,577	330	153	245	100	1,223	1,182

SCHEDULE OF FORECAST PRODUCTION TAX CREDIT CARRYFORWARD BALANCES

Including a 100 aMW wind addition in 2021

			Generated:								
Year	PTC Rate	Beg. Balance	Biglow 1	Biglow 2	Biglow 3	Tucannon	100 aMW	**Total**	Utilized	**End Balance**	**Approx Rev. Req.**
2018	23.46	60,019,333		10,400,403	9,268,556	21,875,330		**41,544,288**	33,960,258	**67,603,364**	**7,195,242**
2019	23.93	67,603,364			9,643,005	22,759,093		**32,402,099**	33,960,258	**66,045,204**	**7,029,402**
2020	24.41	66,045,204				24,152,132		**24,152,132**	33,960,258	**56,237,078**	**5,985,492**
2021	24.90	56,237,078				26,143,044	21,808,843	**47,951,887**	33,960,258	**70,228,708**	**7,474,665**
2022	25.39	70,228,708				28,864,033	22,245,020	**51,109,053**	33,960,258	**87,377,503**	**9,299,866**
2023	25.90	87,377,503				32,505,590	22,689,920	**55,195,510**	33,960,258	**108,612,755**	**11,560,002**
2024	26.42	108,612,755				37,338,705	23,143,719	**60,482,424**	33,960,258	**135,134,921**	**14,382,841**
2025	26.95	135,134,921				43,748,244	23,606,593	**67,354,837**	33,960,258	**168,529,500**	**17,937,132**
2026	27.49	168,529,500					24,078,725	**24,078,725**	33,960,258	**158,647,967**	**16,885,409**
2027	28.04	158,647,967					24,560,300	**24,560,300**	33,960,258	**149,248,008**	**15,884,942**
2028	28.60	149,248,008					25,051,506	**25,051,506**	33,960,258	**140,339,256**	**14,936,755**
2029	29.17	140,339,256					25,552,536	**25,552,536**	33,960,258	**131,931,534**	**14,041,894**
2030	29.75	131,931,534					26,063,586	**26,063,586**	33,960,258	**124,034,862**	**13,201,426**
2031	30.35	124,034,862						**-**	33,960,258	**90,074,604**	**9,586,927**
2032	30.95	90,074,604						**-**	33,960,258	**56,114,346**	**5,972,429**
2033	31.57	56,114,346						**-**	33,960,258	**22,154,088**	**2,357,930**
2034	32.21	22,154,088						**-**	22,154,088	**-**	**-**
2035	32.85	-						**-**	-	**-**	**-**
2036	33.51	-						**-**	-	**-**	**-**
2037	34.18	-						**-**	-	**-**	**-**
2038	34.86	-						**-**	-	**-**	**-**
2039	35.56	-						**-**	-	**-**	**-**
2040	36.27	-						**-**	-	**-**	**-**
2041	36.99	-						**-**	-	**-**	**-**

2018 Present Value Rev. Req.	123,891,127	4.12%
Incremental PVRR from 100 aMW Wind	84,112,427	

SCHEDULE OF FORECAST PRODUCTION TAX CREDIT CARRYFORWARD BALANCES

With Tax Reform, Including a 100 aMW wind addition in 2021

Year	PTC Rate	Beg. Balance	Generated: Biglow 1	Biglow 2	Biglow 3	Tucannon	100 aMW	**Total**	Utilized	**End Balance**	**Approx Rev. Req.**	
2018	23.46	60,019,333		10,400,403	9,268,556	21,875,330		**41,544,288**	17,465,276	**84,098,346**	**8,950,855**	
2019	23.46	84,098,346			9,453,927	22,312,837		**31,766,763**	17,465,276	**98,399,834**	**10,473,008**	
2020	23.46	98,399,834				22,759,093		**22,759,093**	17,465,276	**103,693,652**	**11,036,446**	
2021	23.46	103,693,652				23,214,275	20,550,960	**43,765,235**	17,465,276	**129,993,611**	**13,835,635**	
2022	23.46	129,993,611				23,678,561	20,550,960	**44,229,521**	17,465,276	**156,757,856**	**16,684,239**	
2023	23.46	156,757,856				24,152,132	20,550,960	**44,703,092**	17,465,276	**183,995,673**	**19,583,246**	
2024	23.46	183,995,673				24,635,175	20,550,960	**45,186,135**	17,465,276	**211,716,532**	**22,533,666**	
2025	23.46	211,716,532				25,127,878	20,550,960	**45,678,838**	17,465,276	**239,930,094**	**25,536,525**	
2026	23.46	239,930,094					20,550,960	**20,550,960**	17,465,276	**243,015,779**	**25,864,944**	
2027	23.46	243,015,779					20,550,960	**20,550,960**	17,465,276	**246,101,463**	**26,193,364**	
2028	23.46	246,101,463					20,550,960	**20,550,960**	17,465,276	**249,187,148**	**26,521,783**	
2029	23.46	249,187,148					20,550,960	**20,550,960**	17,465,276	**252,272,832**	**26,850,202**	
2030	23.46	252,272,832					20,550,960	**20,550,960**	17,465,276	**255,358,517**	**27,178,621**	
2031	23.46	255,358,517						**-**	17,465,276	**237,893,241**	**25,319,736**	
2032	23.46	237,893,241						**-**	17,465,276	**220,427,965**	**23,460,851**	
2033	23.46	220,427,965						**-**	17,465,276	**202,962,690**	**21,601,966**	
2034	23.46	202,962,690						**-**	17,465,276	**185,497,414**	**19,743,081**	
2035	23.46	185,497,414						**-**	17,465,276	**168,032,139**	**17,884,196**	
2036	23.46	168,032,139						**-**	17,465,276	**150,566,863**	**16,025,311**	
2037	23.46	150,566,863						**-**	17,465,276	**133,101,588**	**14,166,426**	
2038	23.46	133,101,588						**-**	17,465,276	**115,636,312**	**12,307,542**	
2039	23.46	115,636,312						**-**	17,465,276	**98,171,037**	**10,448,657**	
2040	23.46	98,171,037						**-**	17,465,276	**80,705,761**	**8,589,772**	
2041	23.46	80,705,761						**-**	17,465,276	**63,240,486**	**6,730,887**	
2042	23.46	63,240,486						**-**	17,465,276	**45,775,210**	**4,872,002**	
2043	23.46	45,775,210						**-**	17,465,276	**28,309,934**	**3,013,117**	
2044	23.46	28,309,934						**-**	17,465,276	**10,844,659**	**1,154,232**	
										2018 Present Value Rev. Req.	275,770,443	4.12%
										Incremental PVRR from 500 MW Wind	164,292,502	

SCHEDULE OF FORECAST PRODUCTION TAX CREDIT CARRYFORWARD BALANCES
No wind additions

			Generated:								Approx
Year	PTC Rate	Beg. Balance	Biglow 1	Biglow 2	Biglow 3	Tucannon	100 aMW	**Total**	Utilized	**End Balance**	**Rev. Req.**
2018	23.46	60,019,333		10,400,403	9,268,556	21,875,330		**41,544,288**	33,960,258	**67,603,364**	**7,195,242**
2019	23.93	67,603,364			9,643,005	22,759,093		**32,402,099**	33,960,258	**66,045,204**	**7,029,402**
2020	24.41	66,045,204				24,152,132		**24,152,132**	33,960,258	**56,237,078**	**5,985,492**
2021	24.90	56,237,078				26,143,044		**26,143,044**	33,960,258	**48,419,864**	**5,153,481**
2022	25.39	48,419,864				28,864,033		**28,864,033**	33,960,258	**43,323,640**	**4,611,073**
2023	25.90	43,323,640				32,505,590		**32,505,590**	33,960,258	**41,868,971**	**4,456,248**
2024	26.42	41,868,971				37,338,705		**37,338,705**	33,960,258	**45,247,418**	**4,815,827**
2025	26.95	45,247,418				43,748,244		**43,748,244**	33,960,258	**55,035,404**	**5,857,594**
2026	27.49	55,035,404						**-**	33,960,258	**21,075,146**	**2,243,095**
2027	28.04	21,075,146						**-**	21,075,146	**-**	**-**
2028	28.60	-						**-**	-	**-**	**-**
2029	29.17	-						**-**	-	**-**	**-**
2030	29.75	-						**-**	-	**-**	**-**
2031	30.35	-						**-**	-	**-**	**-**
2032	30.95	-						**-**	-	**-**	**-**
2033	31.57	-						**-**	-	**-**	**-**
2034	32.21	-						**-**	-	**-**	**-**
2035	32.85	-						**-**	-	**-**	**-**
2036	33.51	-						**-**	-	**-**	**-**
2037	34.18	-						**-**	-	**-**	**-**
2038	34.86	-						**-**	-	**-**	**-**
2039	35.56	-						**-**	-	**-**	**-**
2040	36.27	-						**-**	-	**-**	**-**
2041	36.99	-						**-**	-	**-**	**-**
										2018 Present Value Rev. Req.	39,778,699

4.12%

SCHEDULE OF FORECAST PRODUCTION TAX CREDIT CARRYFORWARD BALANCES

With tax reform, no wind additions

Year	PTC Rate	Beg. Balance	Generated: Biglow 1	Biglow 2	Biglow 3	Tucannon	100 aMW	**Total**	Utilized	**End Balance**	**Approx Rev. Req.**
2018	23.46	60,019,333		10,400,403	9,268,556	21,875,330		**41,544,288**	17,465,276	**84,098,346**	**8,950,855**
2019	23.46	84,098,346			9,453,927	22,312,837		**31,766,763**	17,465,276	**98,399,834**	**10,473,008**
2020	23.46	98,399,834				22,759,093		**22,759,093**	17,465,276	**103,693,652**	**11,036,446**
2021	23.46	103,693,652				23,214,275		**23,214,275**	17,465,276	**109,442,651**	**11,648,330**
2022	23.46	109,442,651				23,678,561		**23,678,561**	17,465,276	**115,655,936**	**12,309,630**
2023	23.46	115,655,936				24,152,132		**24,152,132**	17,465,276	**122,342,793**	**13,021,334**
2024	23.46	122,342,793				24,635,175		**24,635,175**	17,465,276	**129,512,692**	**13,784,449**
2025	23.46	129,512,692				25,127,878		**25,127,878**	17,465,276	**137,175,294**	**14,600,004**
2026	23.46	137,175,294						**-**	17,465,276	**119,710,019**	**12,741,119**
2027	23.46	119,710,019						**-**	17,465,276	**102,244,743**	**10,882,234**
2028	23.46	102,244,743						**-**	17,465,276	**84,779,468**	**9,023,349**
2029	23.46	84,779,468						**-**	17,465,276	**67,314,192**	**7,164,464**
2030	23.46	67,314,192						**-**	17,465,276	**49,848,917**	**5,305,579**
2031	23.46	49,848,917						**-**	17,465,276	**32,383,641**	**3,446,694**
2032	23.46	32,383,641						**-**	17,465,276	**14,918,365**	**1,587,809**
2033	23.46	14,918,365						**-**	14,918,365	**-**	**-**
2034	23.46	-						**-**	-	**-**	**-**
2035	23.46	-						**-**	-	**-**	**-**
2036	23.46	-						**-**	-	**-**	**-**
2037	23.46	-						**-**	-	**-**	**-**
2038	23.46	-						**-**	-	**-**	**-**
2039	23.46	-						**-**	-	**-**	**-**
2040	23.46	-						**-**	-	**-**	**-**
2041	23.46	-						**-**	-	**-**	**-**
										2018 Present Value Rev. Req.	111,477,942

4.12%

November 20, 2017

TO: Tyler Pepple
Bradley Van Cleve
Davison Van Cleve, P.C.

FROM: Patrick Hager
Manager, Regulatory Affairs

PORTLAND GENERAL ELECTRIC
LC 66
PGE Response to ICNU Data Request No. 050
Dated November 15, 2017

Request:

Reference PGE's discussion of the proposed cost-containment screen on pages 12-14 of its 2016 IRP addendum.

a. Over what period of time does PGE plan to calculate the levelized cost of resources bid into the RFP for purposes of applying the cost-containment screen? Please explain why PGE chose this period.

b. On the first full paragraph of page 13, how does PGE propose to calculate the "value to PGE customers due to the resource's geographic diversity" for each resource bid into the RFP? Please provide any documents or workpapers PGE uses to make this calculation.

Response:

PGE objects to this request to the extent that it is overly broad and unduly burdensome and on the grounds that it seeks information not relevant to the subject matter of the docket. Without waiving these objections, PGE responds as follows:

a. PGE would levelize the cost of the resource bid over the resource's contract term or economic life. For this reason, the levelization period could be different between bids. The levelization of resource costs over a contract term or over an assumed economic life is a standard practice used to appropriately identify the total cost of the resource annuitized over the duration of resource or contract.

b. PGE proposes to assign each resource bid into the RFP a unique capacity contribution using the RECAP model described in Chapter 5 of the 2016 IRP. Variable energy resources that exhibit geographic diversity relative to PGE's existing portfolio of wind and solar resources may have elevated capacity contributions due to increased capacity factors or timing of generation. Resources with elevated capacity contributions will be credited with additional capacity value associated with their deferral of generic capacity resources.

In addition, PGE proposes to assign each resource bid into the RFP a unique energy value using the Aurora forecasted wholesale energy prices described in Chapter 10 of the 2016 RFP. Variable energy resources that exhibit geographic diversity relative to wind and solar resources present in the wholesale market may also displace more expensive market purchases. Such resources may have higher energy values.

Please refer to PGE's Response to ICNU Data Request Nos. 010 to 013.