BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

LC 66

In the Matter of	)	**NORTHWEST AND**
	)	**INTERMOUNTAIN POWER**
PORTLAND GENERAL ELECTRIC	)	**PRODUCERS COALITION'S**
COMPANY	)	**COMMENTS ON PORTLAND**
	)	**GENERAL ELECTRIC COMPANY'S**
2016 Integrated Resource Plan.	)	**REVISED RENEWABLE ACTION**
	)	**PLAN**

I. INTRODUCTION

The Northwest and Intermountain Power Producers Coalition ("NIPPC") respectfully recommends the Oregon Public Utility Commission (the "Commission") acknowledge Portland General Electric Company's ("PGE's") revised Integrated Resource Plan ("IRP") renewable Action Plan ("Revised Action Plan"). PGE should move forward with a renewable request for proposal ("RFP") expeditiously to capture the full benefits of federal tax credits.[1] NIPPC does not have enough information at this time to support PGE's innovative RFP cost-containment screen, but the Commission need not acknowledge any cost-containment measures when it acknowledges the Revised Action Plan. The Commission should recognize that PGE has proposed a least cost and least risk approach to meeting its energy and capacity needs now. After acknowledgement, the RFP will be a distinct filing and process in a separate docket, and NIPPC and other parties can work with PGE to better understand its proposed RFP design.

[1] NIPPC has advocated consistently to allow PGE to obtain 100% of the Production Tax Credit ("PTC") before it begins its phase out, but there is a very good chance that solar will be competitive in PGE's RFP, due in part to legislative tax changes being drawn up, and 2019 is the last year to get 30% of the Investment Tax Credit ("ITC") as well.

These Comments focus on three aspects of PGE's filing. First, NIPPC's support for PGE's proposal to initiate a renewable RFP in early 2018 targeting approximately 100 average megawatts ("MWa") of new renewable resources. Next, NIPPC's concerns regarding PGE's plan to include a cost-containment screen in its impending RFP. Finally, NIPPC's recognition and support for PGE's creative efforts to design a least cost and least risk plan for meetings its resource needs, including its commitment to return the value of any renewable energy certificates ("RECs") procured prior to 2025.

II. COMMENTS

Although the same long-term uncertainty that led the Commission to not acknowledge PGE's original renewable resource Action Plan remains, PGE's Revised Action Plan proposes more modest, incremental action that focuses on PGE's near-term need and adequately addresses the Commission's concerns. The Revised Action Plan represents just over 10% of PGE's long-term RPS need.[2] By way of comparison, if PGE were to wait until 2030 to begin acquiring renewable resources, PGE believes it would need to integrate 948 MWa (about 2,800 to 3,800 MW) of renewable generation onto its system in only 11 years.[3] This kind of just-in-time approach does not present the least-cost and least-risk approach. PGE's Revised Action Plan is a win-win because it allows PGE to take advantage of near-term cost opportunities and add to its resource diversity without exposing PGE's ratepayers to unnecessary long-term risks.

PGE's Action Plan also includes an RFP design measure to protect customers and possible mechanisms to return REC value to customers. NIPPC appreciates PGE's efforts to increase value and reduce risk for customers, but both proposals need additional consideration

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[2] PGE's Addendum at 4 ("PGE estimates that this action would fulfill approximately 11% of the incremental renewable development required to meet its 2040 RPS obligations").

[3] Attachment A at 9 (PGE's Revised RPS Action Workshop Presentation (Sept. 25, 2017)).

and should not be acknowledged at this time. For example, PGE's cost-containment screen is designed to ensure that the value offered by bidders exceeds the bid price. Likewise, PGE proposes three options that allow PGE to return the value of RECs purchased prior to 2025 to its customers. While both of these appear to be generally workable ideas in principle, the Addendum filing does not provide adequate information to fully evaluate them as proposals. This docket simply does not have enough process left to respond to these ideas.

Finally, NIPPC is very concerned that PGE has not issued its RFP yet, and that there may be insufficient time to review its basic terms and conditions, let alone analyze PGE's innovative ideas. NIPPC has asked PGE, during the post-IRP workshops, to informally release its draft RFP early rather than wait until early December as PGE plans. Given the past controversy regarding PGE's RFPs and the need have the RFP issued to the market soon, it is extremely disappointing that PGE has not shared or filed the RFP yet. To date, NIPPC has not seen PGE's draft RFP, and NIPPC hopes that PGE will proactively address NIPPC and other parties' concerns that PGE's prior RFPs were unfair and biased toward utility ownership options. Because PGE has waited an unnecessarily long amount of time before issuing its RFP, it is incumbent upon PGE to ensure that it is as uncontroversial as possible.

A. PGE Should Acquire Modest Amounts of Renewables to Meet Its Near-Term Energy and Capacity Need

PGE has a current energy need of approximately 100 MWa that should be met with new renewable resources. While the size of PGE's current energy and capacity need justifies immediate supply side action, PGE estimates its market purchases will double by 2021 absent any new resource acquisition. In the current economic environment, short-term market purchases remain a reasonable and necessary option for utilities to meet their energy needs. But

as both PGE's and PacifiCorp's IRPs demonstrate, longer term renewable resources acquisitions and power purchase agreements are currently the least-cost option.[4] This is due in large part to current federal tax credits that may offer substantial savings to PGE's customers and should not be allowed to expire lightly.

PGE's Revised Action Plan is reasonable because it is limited to acquire resources to only meet PGE's current need. By way of reminder, PGE's IRP determined that PGE could acquire up to 300 MWa of cost-effective renewable resources, and PGE's original Action Plan called for just over half that amount—175 MWa of renewable resources.[5] PGE's current proposal seeks to acquire the approximately 100 MWa of renewable RPS-eligible resources needed to fulfill its current energy and capacity needs. The Revised Action Plan is modest and offers the incremental approach that was lacking in the unacknowledged Action Plan.

PGE's Revised Action Plan also offers a long-term vision that provides PGE flexibility to make adjustments as needed. According to PGE, the Revised Action Plan leaves approximately 850 MWa of headroom for PGE to acquire before 2040.[6] This Revised Action Plan will ensure PGE is on track with its RPS obligations until 2030, when the RPS requirement jumps to 35%. The Commission need not opine on PGE's long-term plans to approve the Revised Action Plan, but should be aware that PGE's near-term acquisition is consistent with multiple long-term plans analyzed by PGE. Despite being consistent with these least cost and least risk long-term plans, PGE is not committing to, or asking for acknowledgment of and particular long-term plan and is simply demonstrating how the near-term action fits into its long-term planning.

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4 See PGE's IRP at 337 (Nov. 15, 2016); PacifiCorp 2017 IRP, Docket No. LC 67, PacifiCorp's IRP at 16 (Apr. 4, 2017).

5 PGE's IRP at 29.

6 Attachment A at 65 (PGE's Revised RPS Action Workshop #2 Presentation (Oct. 27, 2017)).

B. PGE Should Release its Draft RFP Immediately

PGE's Addendum filing outlines a creative cost-containment strategy that requires additional consideration. Specifically, PGE intends to screen the RFP bids to avoid paying any of the incremental costs traditionally associated with RECs. Stated another way, PGE intends to effectively disqualify any bids that have a real levelized cost above its forecasted levelized value, as determined by PGE. PGE will derive the cost-containment screen from its 2016 IRP Reference Case, by combining the resource's forecasted energy and capacity values to determine a total value.[7] Under the Reference Case conditions, PGE calculated a wind resource with an energy value of $49/MWh and a capacity value of $4/MWh.[8] PGE's Addendum filing provides additional examples as well.[9] Because each bid will have a unique energy and capacity value, it is not easy for bidders to understand how their energy and capacity values will be calculated under the RECAP methodology. Instead, bidders can only guess how they are likely to measure up against PGE's Reference Case.

NIPPC appreciates PGE's attempt to value resource diversity beyond its limited IRP analysis, but as PGE's last RFP proposal illustrates, RFP review can be highly controversial under the best of circumstances. Stakeholders and the Commission staff ("Staff") need time to review the details of PGE's cost-containment screen before it should be utilized. For that reason, NIPPC asked PGE to informally release its RFP immediately to allow as much time for review as possible. To date, PGE has not released the RFP. NIPPC therefore points out that the

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7 PGE's Addendum at 12.

8 Id. at 7. According to PGE, the PTC reduces the levelized cost of a wind project by $20/MWh. Id.

9 Id. at 13.

Commission should not acknowledge the cost-containment screen at this time.[10] RFP design is not something that is traditionally part of the IRP process.

Because time is of the essence to utilize the full PTC benefit, the Commission should either direct PGE to advance its RFP design as early as possible (without formally acknowledging it) or to forego this creative concept and rely upon a more traditional RFP instead. PGE has explained that it expects bid prices to come in well beneath the IRP Reference Case, which means that this bid screening may not be necessary to protect customers.

C. PGE's Commitment to Return the Value of Unneeded RECs Should Be Commended

In addition to the cost-containment measure PGE intends to implement in its impending RFP, PGE has also committed to return the value of any RECs procured before 2025 to its customers. This commitment responds to parties' concerns that customers should not be required to assist PGE in "banking" RECs that PGE did not need in the near term for RPS compliance. PGE believes that the current economic environment will allow it to procure cost-effective renewable resources without considering the additional value from RECs.[11] In other words, the cost of renewable resources are low enough that they may be economic regardless of whether they are needed to meet RPS obligations. Since the RECs are not needed in the immediate term, PGE could either continue to bank unneeded RECs or could explore options for selling the unneeded RECs to ensure that the value is returned to customers.

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10 Compare id. at 24 ("PGE intends to file a final draft RFP with the Commission in January 2018, subject to acknowledgement of the revised Renewable Action in this addendum") with id. at 14 ("PGE is not requesting acknowledgment of the exact mechanism for capturing the value of RECs generated prior to 2025").

11 Id. at 12.

PGE's Addendum proposes three creative ideas for returning REC value to customers: 1) wholesale REC sales; 2) retail REC sales; and 3) potential carbon compliance. PGE acknowledges that retail sales may not be possible without additional consideration from the Commission, and that carbon compliance is speculative.[12] In addition, any retail sales of RECs would need to be consistent with the Commission's policies regarding voluntary renewable energy tariffs or otherwise not provide PGE with an undue advantage over direct access energy service supplier. PGE is not requesting acknowledgment of any exact mechanism for capturing REC values, however, and the concept of returning REC values and increasing the benefits to customers is generally agreeable.

III. CONCLUSION

For the reasons described above, NIPPC recommends the Commission acknowledge PGE's Revised Action Plan and permit PGE to move forward with a more modestly sized renewable RFP. NIPPC requests, however, that the Commission decline to acknowledge PGE's cost-containment screen or any particular mechanism for returning REC values to customers at this time. These creative ideas should be considered in the upcoming RFP or in later proceedings after the Commission acknowledges PGE's more layered resource procurement strategy.

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[12] Id. at 14.

Dated this 1st day of December 2017.

Respectfully submitted,

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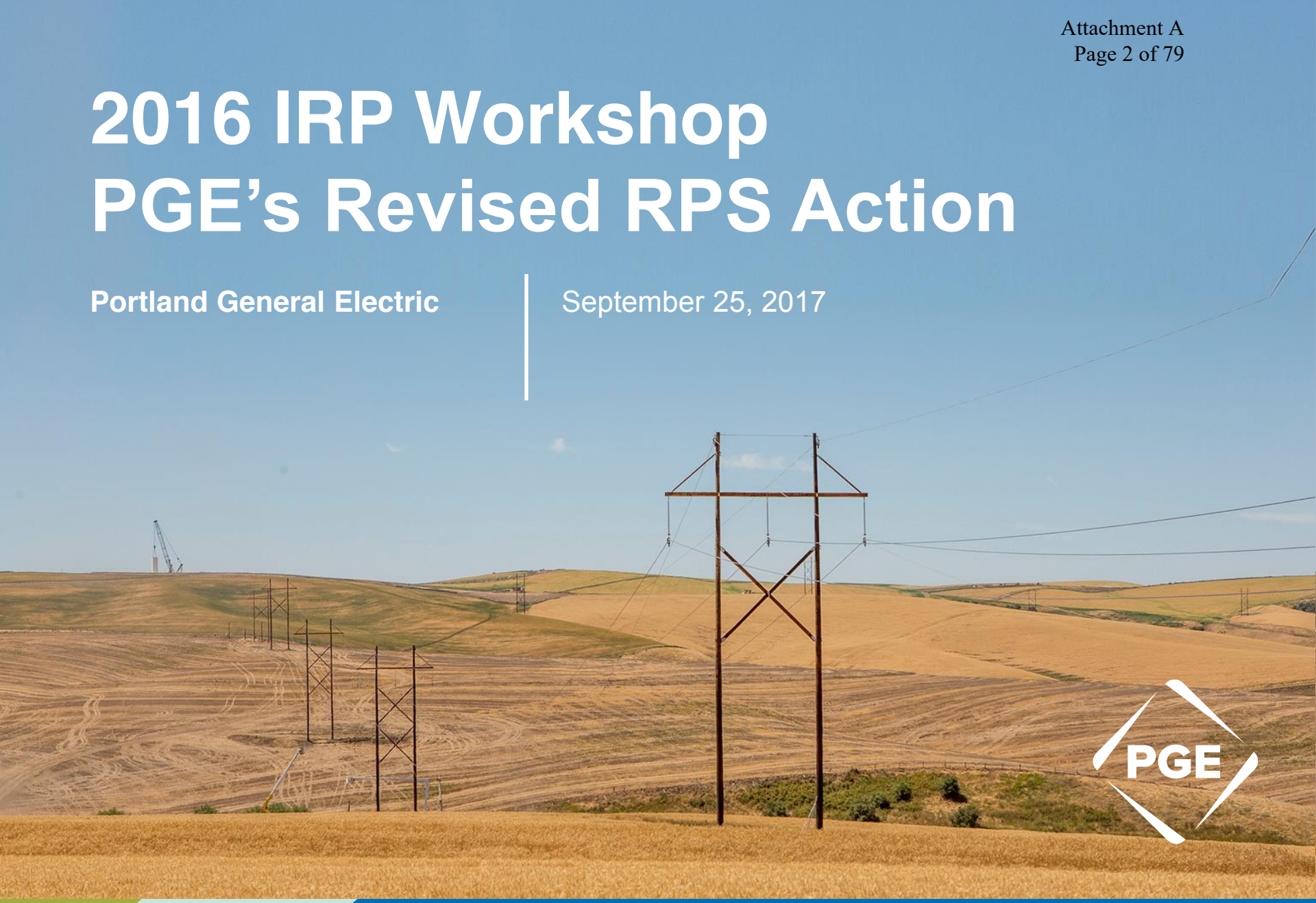
Of Attorneys for Northwest and
Intermountain Power Producers Coalition

Attachment A

PGE's Revised RPS Action Workshop Presentations

2016 IRP Workshop
PGE's Revised RPS Action

Portland General Electric | September 25, 2017



Safety Moment

Emergency Preparedness Tips

Pack a kit

- 3+ days of food & water
- Health supplies
- Personal care items
- Safety supplies
- Electronics
- Documents, maps, and cash

Be informed

- Sign up for PublicAlerts
- Listen to/watch local news reports
- Pay attention to watches and warnings

Make a plan

- Communication plan with contact cards
- Find safe spots in your home and escape routes
- Choose meeting place
- Practice

Want to help those currently affected by emergencies in Mexico, the Caribbean, or South Asia?

Online tools like charitynavigator.org and charitywatch.org can help you find a way to direct your donations to effective organizations

Key questions from IRP Public Meeting

At the August 8th Public Meeting, the Commission requested that PGE engage Staff and stakeholders to consider the potential for a revised RPS Action

1. How would an RPS action address a near term or medium term need?
2. How can incremental near-term actions be grounded in a longer-term RPS compliance strategy?
3. How can an RPS action enhance the diversity of PGE's portfolio?
4. How can customers be protected against high cost outcomes?

Stakeholder engagement process

Meetings to date:

Staff (8/18)

CUB (8/24)

ICNU (8/29)

NWEC & RNW (8/29)

Sierra Club (9/5)

NIPPC (9/18)

- In August and September, PGE conducted individual meetings with Staff and stakeholders
  - Identified specific concerns that could be addressed through a revised proposal
  - Solicited stakeholder feedback on potential options
- Today's workshop will summarize PGE's thinking on a potential revised RPS Action based on discussions with stakeholders to date
- PGE aims to report back to the Commission on the status of this effort at the October 10th Public Meeting

Goals for today

- PGE will present supplemental analysis, rationales, and options for a revised RPS action
  - Address the questions raised by the Commission, Staff, and Intervenors
  - Focus on mitigating the unquantifiable risks raised within LC 66, not a re-examination of PGE's NPVRR analysis of the value of early RPS Action
- PGE is seeking an open and constructive dialogue
  - Please share concerns
  - Please also help us to identify strengths of potential options
- Other goals?

1. How would an RPS action address a near term or medium term need?

PGE's Resource Needs

How would an RPS action address a near term or medium term need?

- Staff and the Commission expressed a concern that an RPS Action that does not address a near-term need may introduce issues of intergenerational equity
- RPS-eligible resources can contribute to PGE's near-term energy and capacity needs while also contributing to long term RPS needs

	2021	2025	2030
RPS Compliance (MWa)			
Physical RPS Need	0	96	322
Minimum REC Need	0	0	322
Resource Adequacy (MW)			
Capacity Need	561	839	1,185
Energy (MWa)			
Energy Need	98	292	521
Market Purchases	107	420	768

PGE's Resource Needs - RPS

RPS-eligible resources help PGE meet its mid- and long-term RPS obligations

- PGE's expected just-in-time REC need is approximately 322 MWa in 2029/2030
- Delaying RPS procurement to 2030 would require PGE to integrate **948 MWa (about 2,800-3,800 MW) of renewables in 11 years** to be physically compliant with the RPS by 2040 and would forego near-term opportunities to achieve cost savings for customers through federal tax credits
- How can PGE develop a near-term incremental procurement target in the context of a longer term "glide path" to 2040?

PGE's Resource Needs - Capacity

RPS-eligible resources may meet near term capacity needs

- In PGE's 2016 IRP Preferred Portfolio, approximately 60 MW of the 2021 capacity need was met with the PNW Wind resource
- Consistent with the Action Plan, PGE set the procurement target for the bilateral negotiation process based on the assumption of up to 60 MW of capacity being provided by RPS-eligible resources in the 2021 time frame
- A revised RPS Action could specifically seek RPS-eligible resources that provide capacity up to 60 MW
- With RECAP, PGE has the ability to calculate the capacity contribution of any renewable resource with estimated hourly output data

Example Resources	Capacity Contribution
100 MW PNW Wind	~19 MW
100 MW Single-Axis Tracking Solar PV	~15 MW
100 MW Montana Wind	~39 MW

PGE's Resource Needs - Energy

RPS-eligible resources meet near term energy needs

- PGE de-emphasized energy needs in the 2016 IRP in favor of capturing the impact of increased market exposure associated with an energy need through the risk analysis
- PGE is forecasted to be 107 MWa short to market in 2021, which could be reduced with renewable resources

Example Resources	Reduction in Market Exposure
100 MW PNW Wind	34 MWa
100 MW Central OR Single-Axis Tracking Solar PV	24 MWa
100 MW Montana Wind	42 MWa

Discussion

How would an RPS action address a near term or medium term need?

- Should a revised RPS Action proposal seek RPS-eligible energy and capacity resources to meet near-term needs?
  - Portfolio capacity contribution target?
  - Portfolio capacity contribution not-to-exceed cap?
  - Include capacity contribution in bid evaluation?
- Other feedback or thoughts?

2. How can incremental near-term actions be grounded in a longer-term RPS compliance strategy?

Planning with an RPS glide path in mind

How can more incremental near-term actions be grounded in a longer-term RPS compliance strategy?

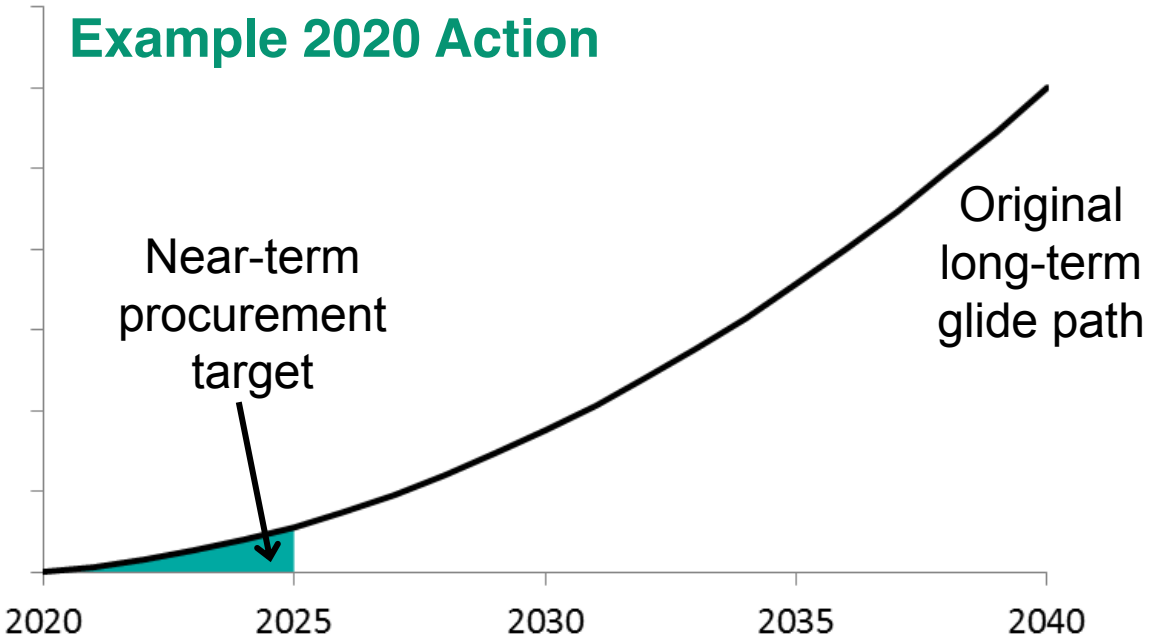
A glide path represents a long term strategy that helps to inform a near term action

Purpose of a glide path: To ensure that PGE can make incremental progress toward long term RPS compliance while preserving flexibility to account for changing conditions and to capture opportunities for cost savings over time (both tax credits and technology cost reductions)

Incremental actions and flexibility

How can more incremental near-term actions be grounded in a longer-term RPS compliance strategy?

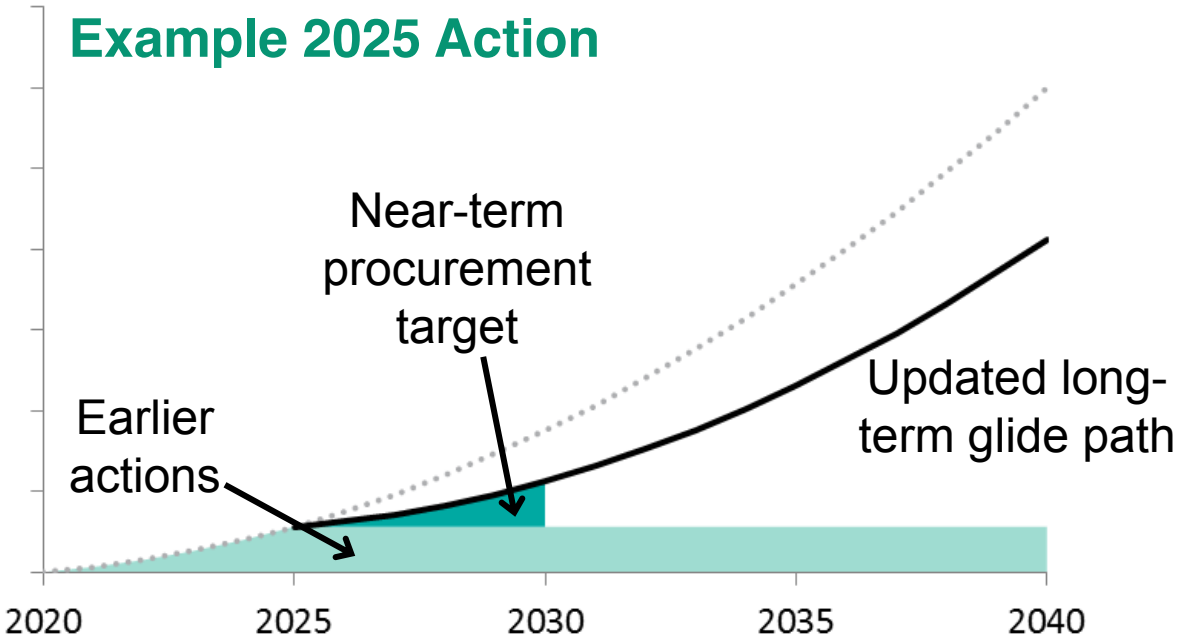
Example: Start with a glide path based on today's forecasts and analysis



Incremental actions and flexibility

How can more incremental near-term actions be grounded in a longer-term RPS compliance strategy?

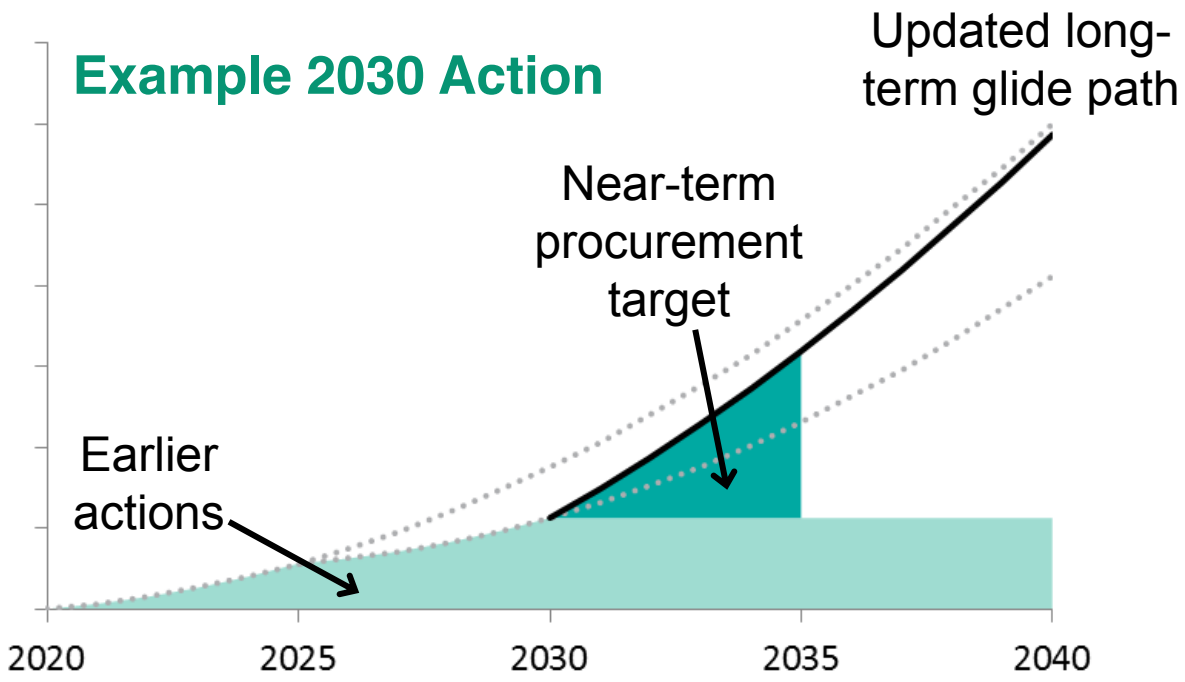
Glide path may flatten in the future (e.g., high EE adoption)



Incremental actions and flexibility

How can more incremental near-term actions be grounded in a longer-term RPS compliance strategy?

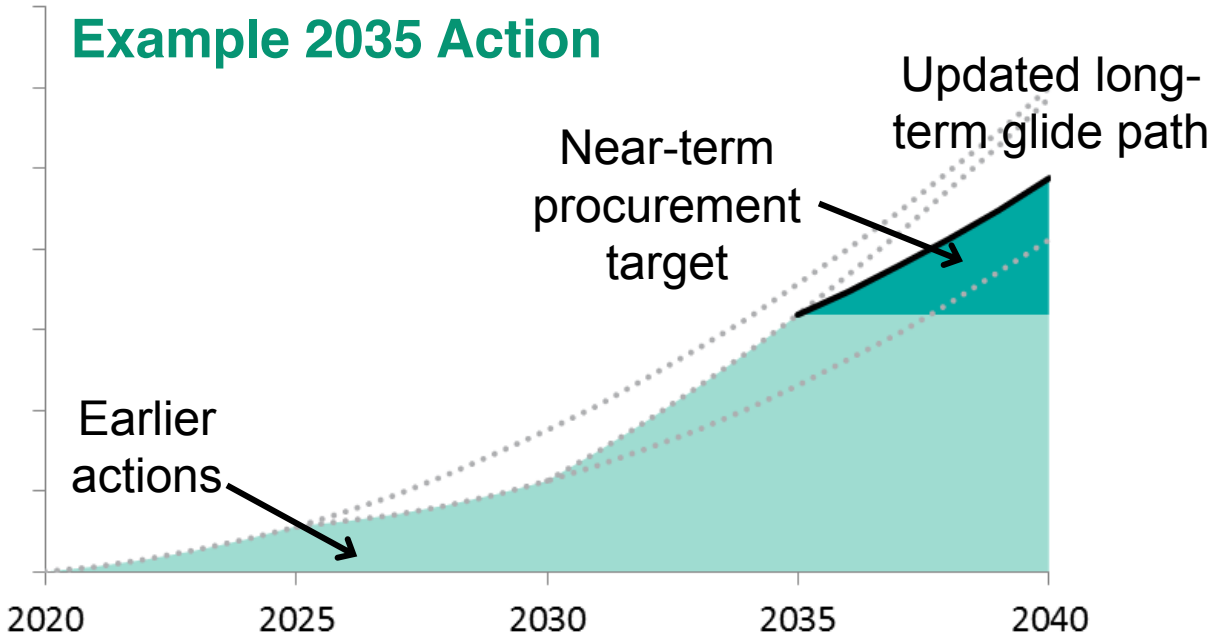
Glide path may steepen in the future (e.g., high EV adoption)



Incremental actions and flexibility

How can more incremental near-term actions be grounded in a longer-term RPS compliance strategy?

Glide path converges to actual 2040 obligation and actions represent changing conditions over time



RPS Glide Paths

How can more incremental near-term actions be grounded in a longer-term RPS compliance strategy?

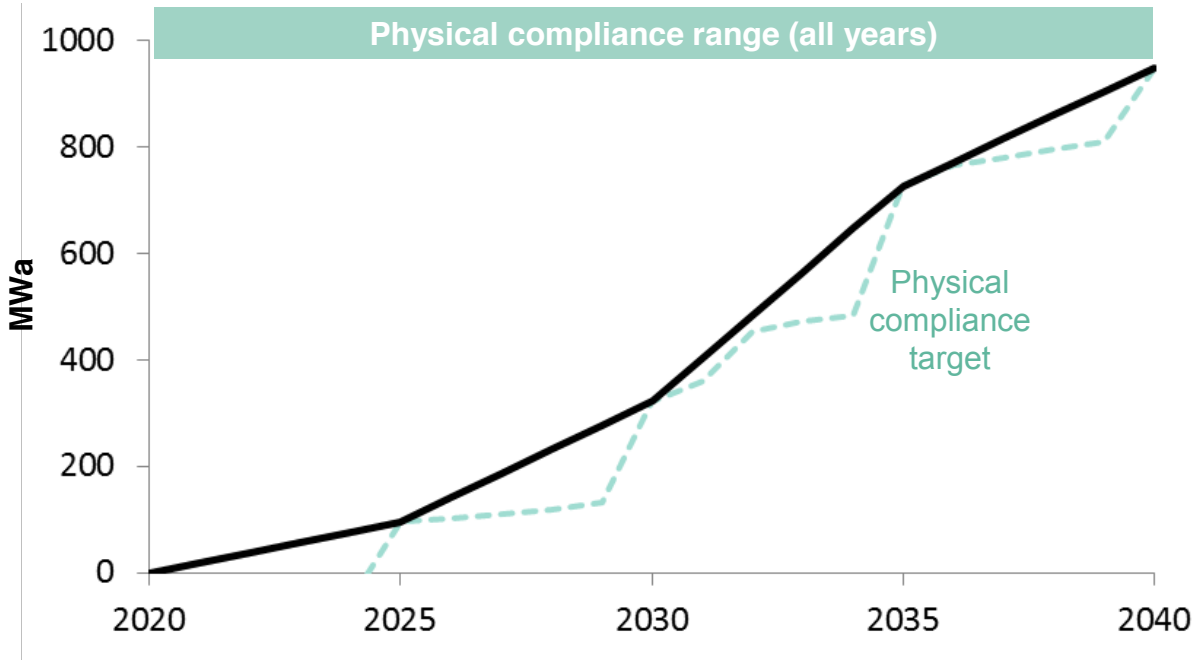
PGE has developed several potential glide paths based on various planning principles:

- **Physical RPS compliance**
  - Straight line glide paths to 5-yr physical compliance targets
- **Estimated first year net variable cost impacts**
  - Constant net variable cost increases associated with RPS additions over time, as a fraction of rev. req.
  - Constant discounted net variable cost increases associated with RPS additions, as a fraction of rev. req. (requires lower net cost impacts in near term than long term)
- **IRP Portfolios**
  - Early Action and Delay
- **Blended Glide Path**

RPS Glide Paths

Physical compliance-based glide paths ensure steady progress toward 2040 obligation

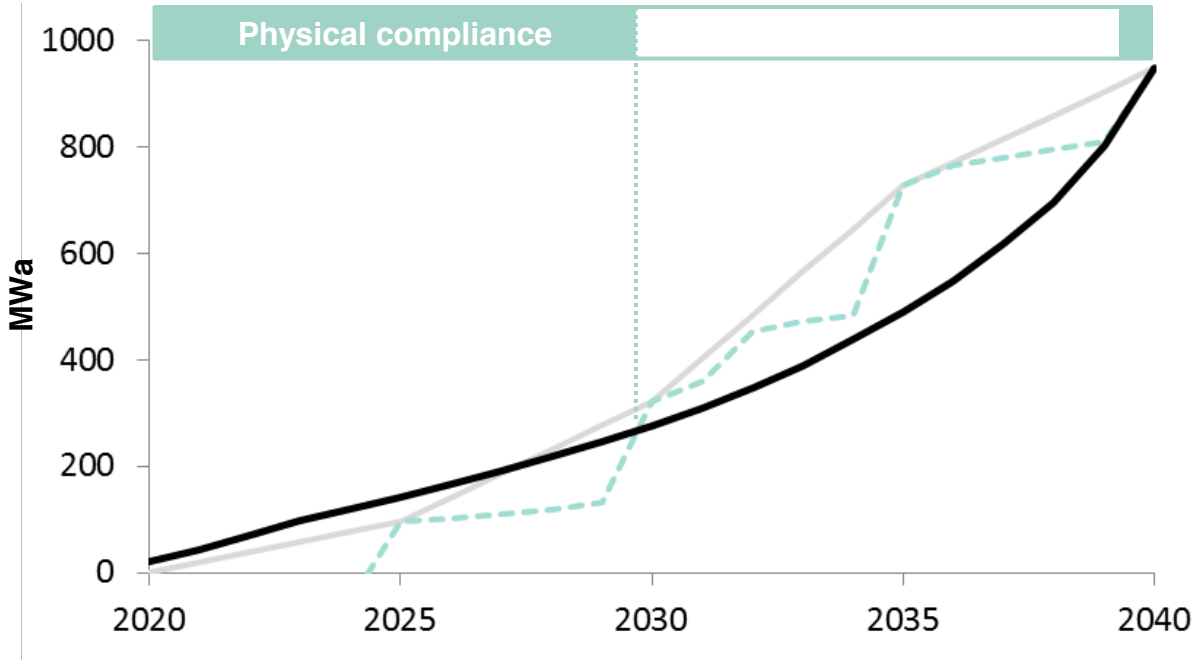
Straight Line Glide Paths to Physical Compliance Targets every 5 years



RPS Glide Paths

Glide path that achieves constant net variable cost increases by year tend to back-load procurement, leading to non-physical compliance in 2030s

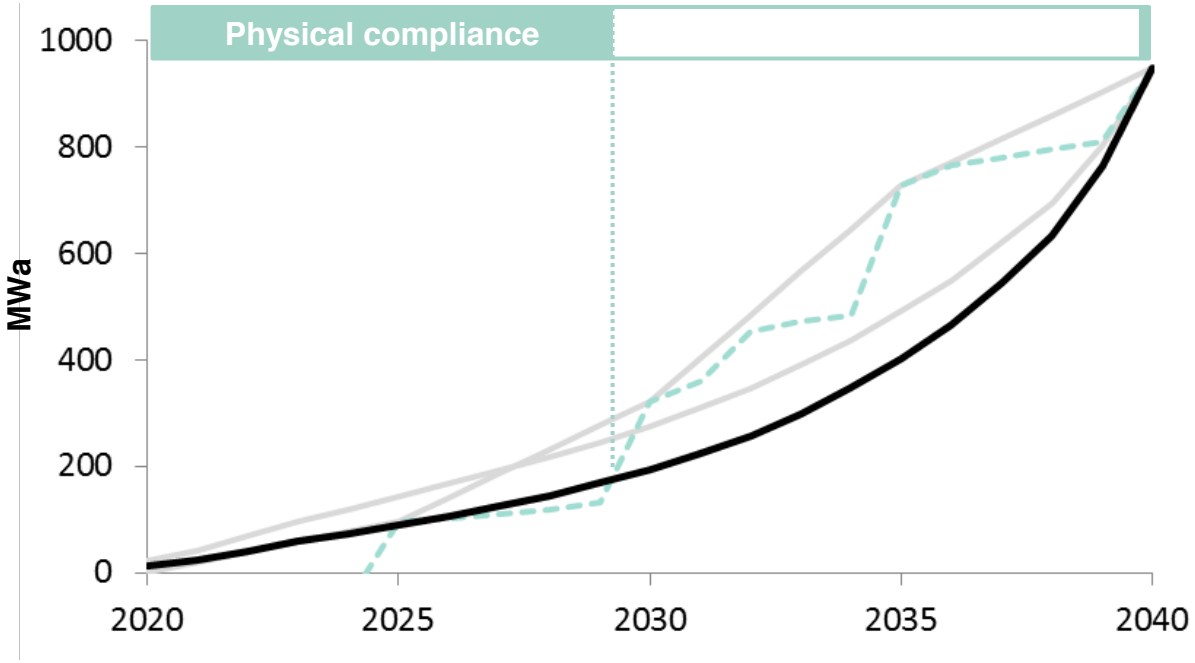
Constant Net Variable Cost Increases (0.36% of revenue requirement per year)



RPS Glide Paths

Glide path that achieves constant discounted net variable cost increases by year puts additional emphasis on back-loading procurement

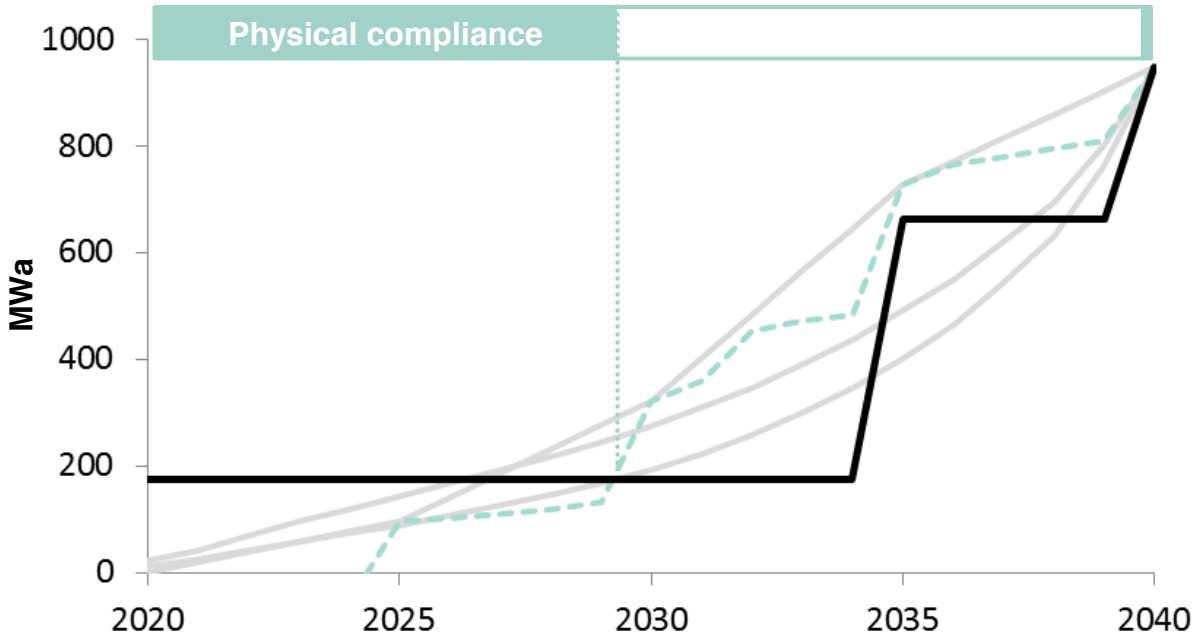
Constant Discounted Net Variable Cost Increases (0.21% of revenue requirement in 2020, escalating with discount rate)



RPS Glide Paths

Capturing tax credits front loads first tranche of resource procurement and back-loads the remainder to capture price reductions

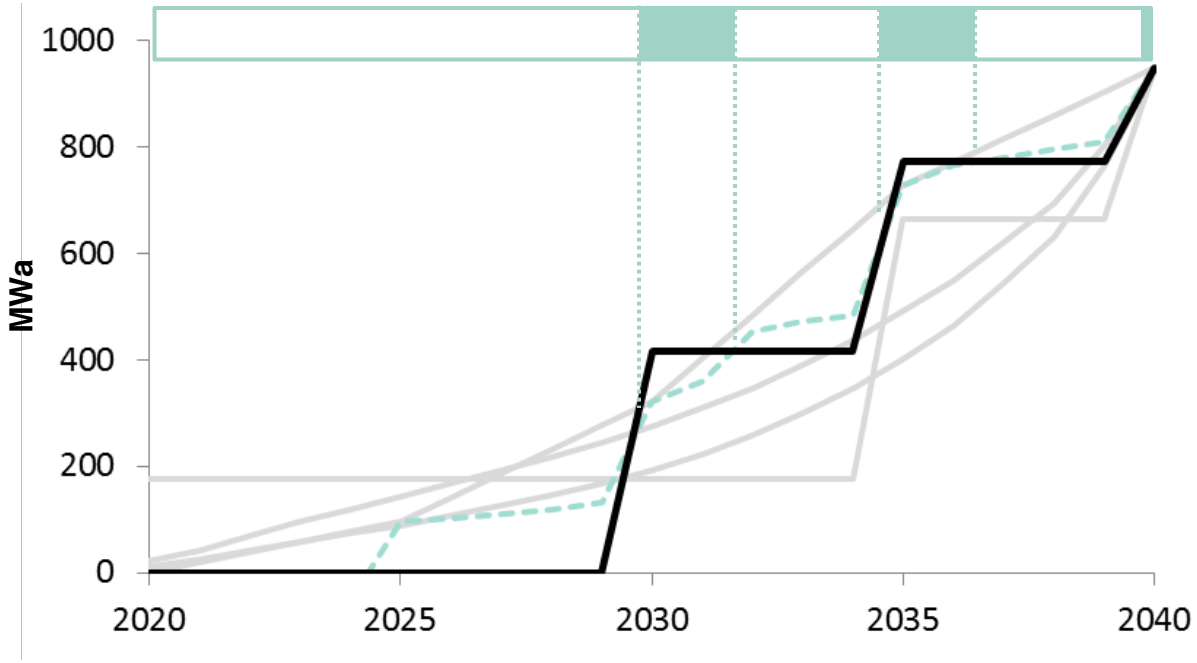
Early RPS Action Portfolio – 175 MWa in 2020, just-in-time in 2035 and 2040



RPS Glide Paths

Delay glide path back-loads procurement and foregoes tax credit opportunity

Delay Portfolio incorporates just-in-time procurement in 2030, 2035, and 2040

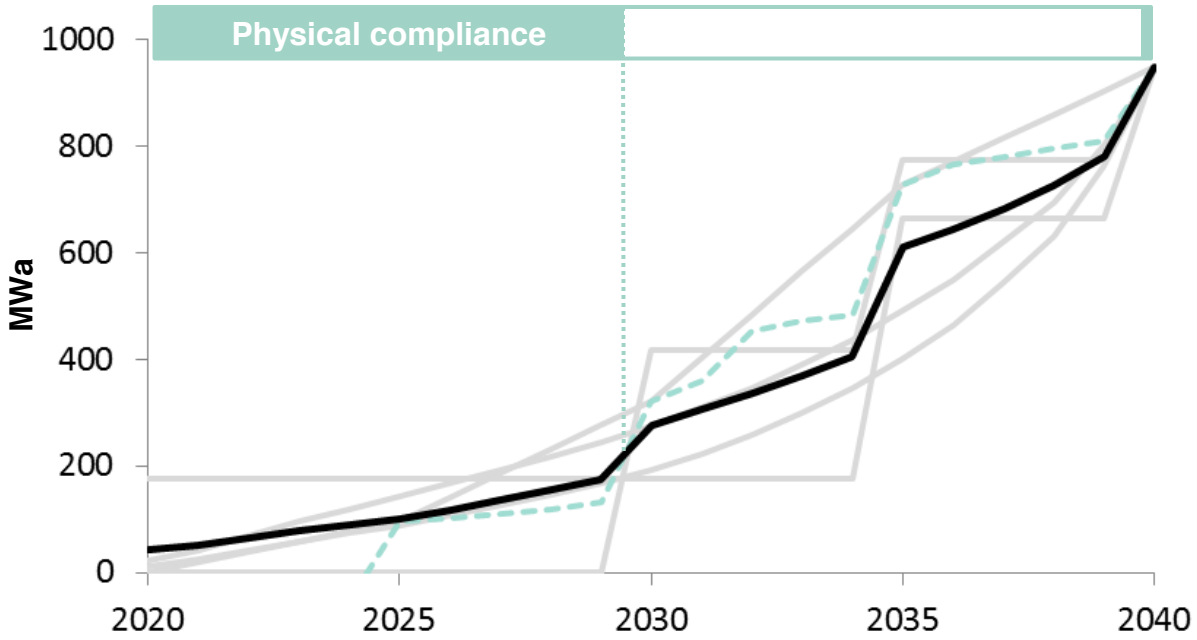


RPS Glide Paths

A blended glide path maintains multiple opportunities:

- Captures some tax benefits in near term
- Allows for accelerated procurement in the outer years as technology cost reductions materialize
- Steady progress toward 2040 goal ensures learning and stable market signals

Blended glide path balances near-term and long-term considerations

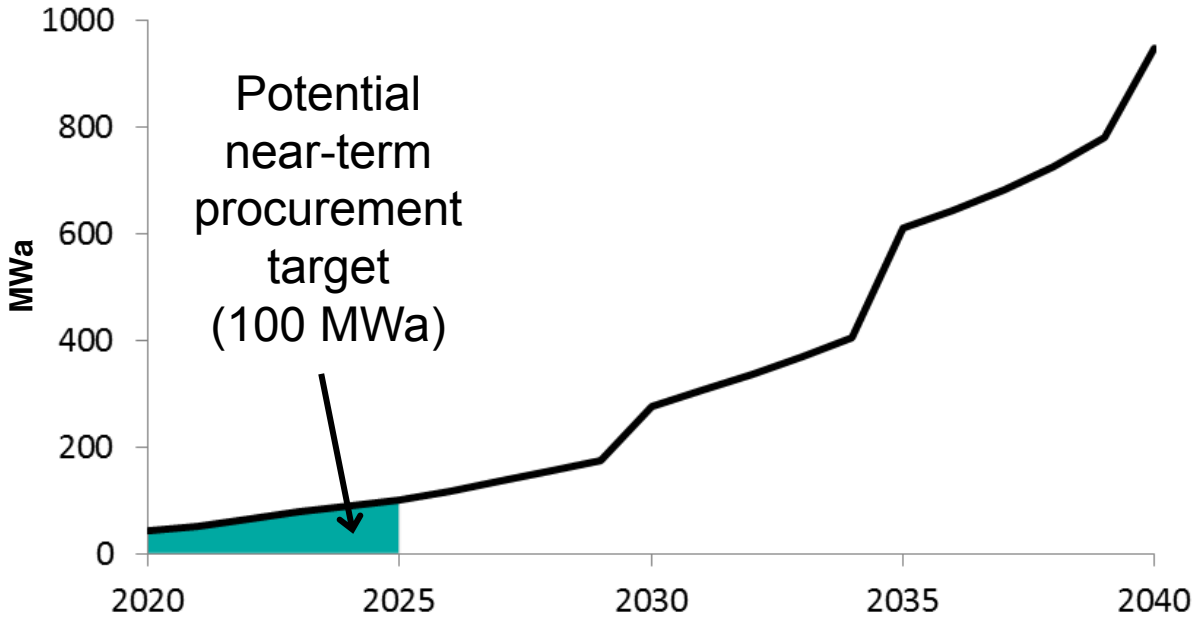


Blended Glide Path

A blended glide path maintains multiple opportunities:

- Captures some tax benefits in near term
- Allows for accelerated procurement in the outer years as technology cost reductions materialize
- Steady progress toward 2040 goal ensures learning and stable market signals

Blended glide path results in RPS procurement target of approximately 100 MWa by 2025



Near term procurement target

Potential glide paths balance near-term and long-term cost impacts

Potential Glide Path	2020-2025 Target	*Estimated First Year Net Variable Cost Impact (% of rev req)
5-yr physical compliance	96 MWa	~1.4%
Year 1 net variable cost impact		
Escalates with inflation	142 MWa	~2.1%
Escalates with discount rate	89 MWa	~1.3%
Evaluated portfolios		
Early RPS Action	175 MWa	~2.6%
Delay	0 MWa	0.0%
Blended Glide Path	100 MWa	~1.5%

*Assumes fixed real levelized pricing, no carbon price, and that full 2020-2025 target is met with COD 2020 resource to capture tax benefit

Procurement Target Structure

Given the glide path, how can a procurement target be designed to address PGE's needs and achieve low cost outcomes for customers?

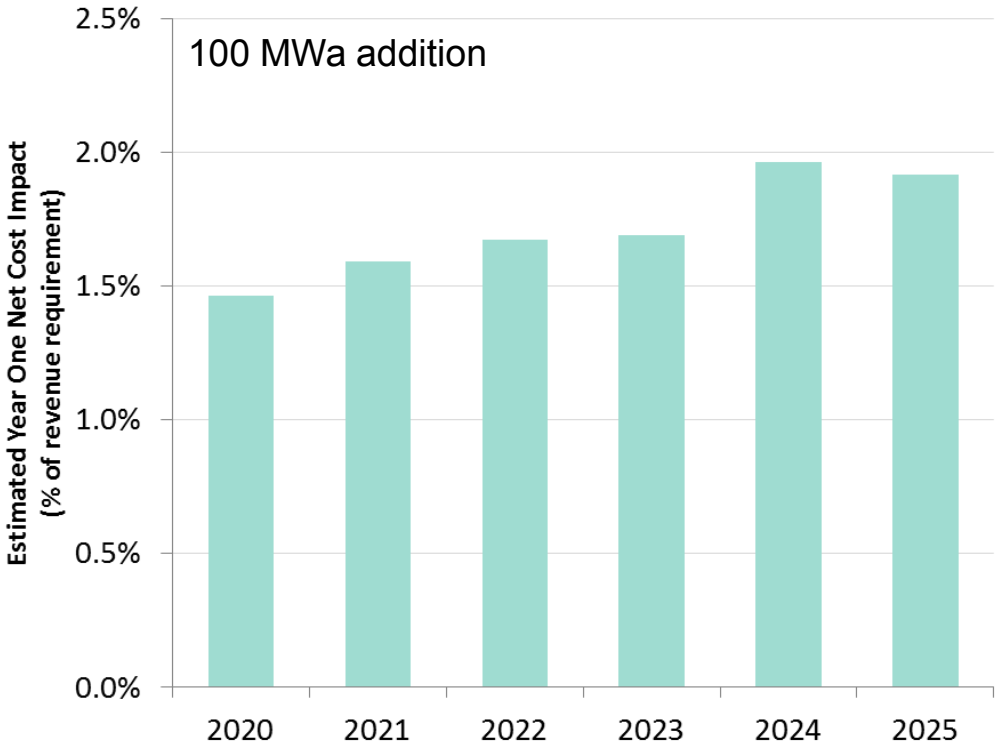
Objectives in designing the procurement target:

- Ensure that resource options contribute to meeting PGE's near-term needs
- Preserve option to procure resources that qualify for federal tax credits
- Address concern that early action could result in a substantial volume of RECs well in advance of REC need

Procurement Target Structure

Preserving ability to capture federal tax credit benefits reduces the estimated cost impacts

Estimated year one net cost impacts increase with COD through 2024 due to PTC phase-out

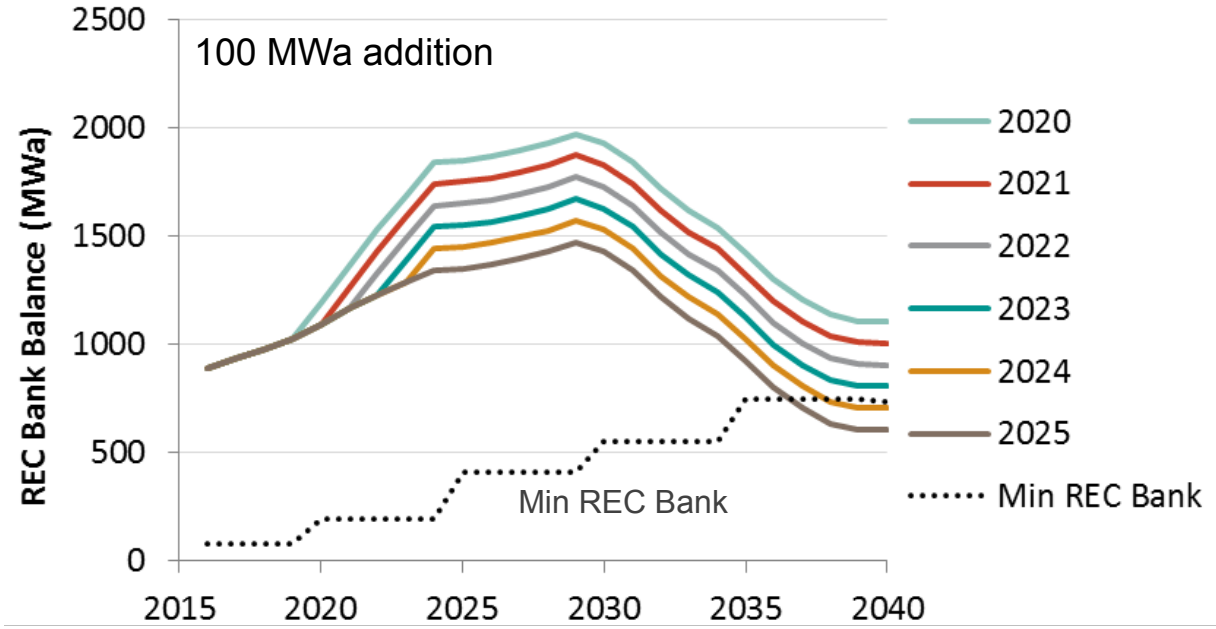


*Assumes fixed real levelized pricing and no carbon pricing

Procurement Target Structure

Structures that seek RECs at later dates tie closer to year of REC need and reduce banked RECs

REC bank balance increases more the earlier that RECs enter PGE's portfolio



*Assumes 100 MWa addition in specified year and annual REC additions post 2025 follow Blended Glide Path

Procurement Target Structure

Given the glide path, how can a procurement target be designed to address PGE's needs and achieve low cost outcomes for customers?

Objectives in designing the procurement target:

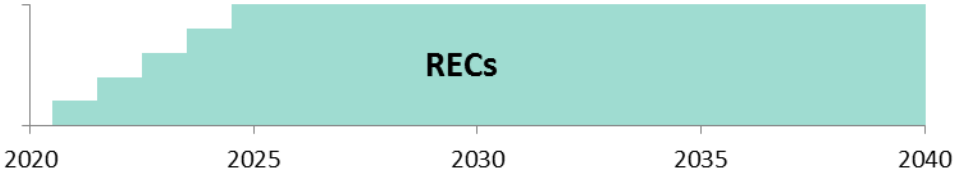
- Ensure that resource options contribute to meeting PGE's near-term needs
- Preserve option to procure resources that qualify for federal tax credits
- Address concern that early action could result in a substantial volume of RECs well in advance of REC need

These objectives appear to be in competition – a workable structure should balance both considerations

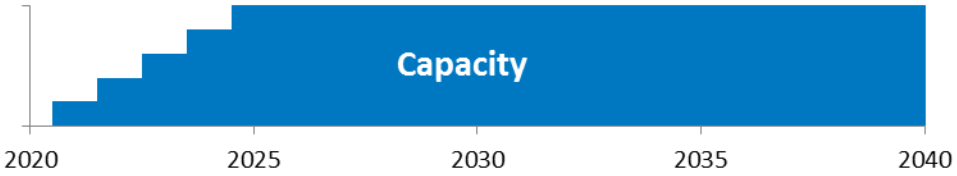
Option #1. Layered Targets

Layered targets promote incrementalism, but may not achieve lowest cost outcomes due to expiring tax credits

REC target is layered in between 2020 and 2025



Capacity cap is layered in tandem with the REC target



Benefits

- REC target increases over time to be more in alignment with timing of PGE's REC needs
- Capacity cap increases over time as PGE's capacity needs increase

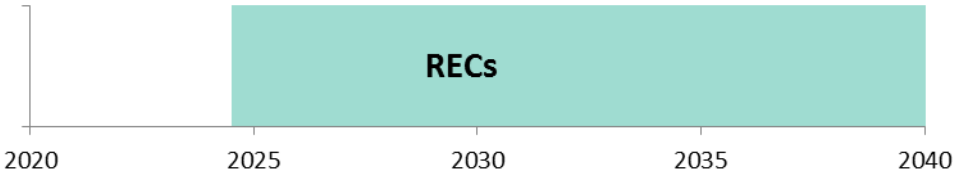
Drawbacks

- Staging may be overly prescriptive – may rule out cost competitive options
- May limit opportunity to capture PTC benefits

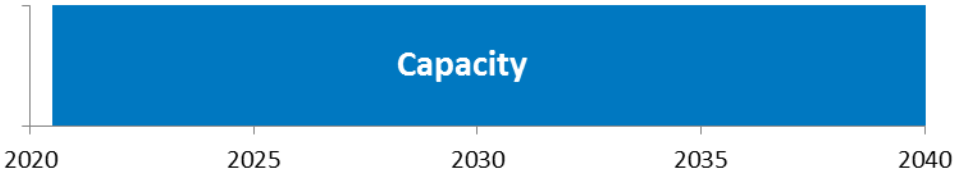
Option #2. Decouple REC target and capacity

Allowing flexibility in timing between COD and REC deliveries may address concerns around need while preserving opportunities for cost savings

REC target seeks resources that can provide RECs by 2025



Capacity cap allows for (and credits) resources that provide capacity as early as 2021



Benefits

- Consistent with timing of PGE's capacity needs, ensuring that near-term resources meet near-term needs
- Does not require PGE to acquire RECs far in advance of REC need
- Maintains options to reduce costs through federal tax credits
- Potentially creates opportunities for resources to provide near-term RECs to other off-takers

Drawbacks

- New framework – would require clear communication

Discussion

How can incremental near-term actions be grounded in a longer-term RPS compliance strategy?

- What procurement target size reasonably balances the NPVRR value of early RPS action with near-term rate impacts and unquantifiable future risks?
  - Physical RPS need (96 MWa)?
  - Rate impact-based range (89-142 MWa)?
- Would an RFP that allows for decoupling of COD from REC deliveries appropriately address the timing difference between PGE's capacity and energy needs and PGE's REC needs?
- Would such an RFP be workable for potential bidders?
- Other thoughts or feedback?

3. How can an RPS action enhance the diversity of PGE's portfolio?

Portfolio Diversity

How can an RPS action enhance the diversity of PGE's portfolio?

Ensure that RFP scoring accounts for resource diversity benefits

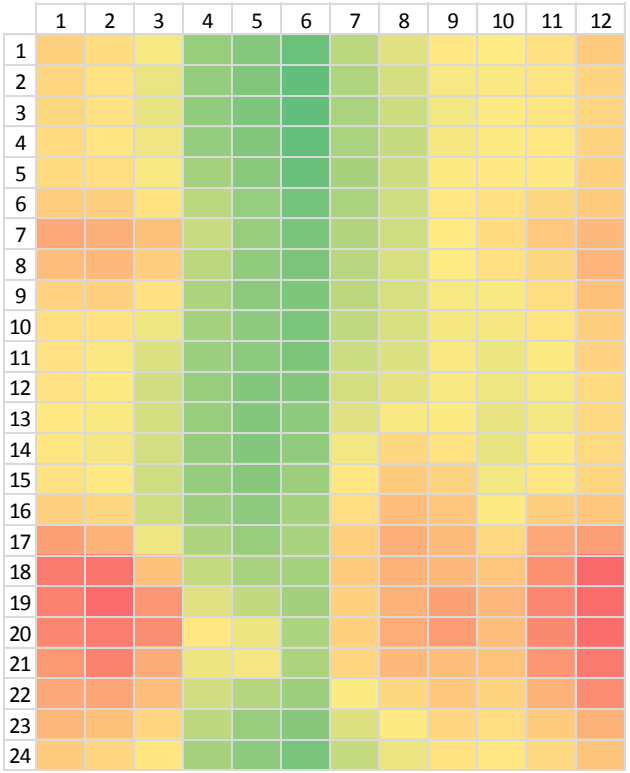
Existing methodology:

- Energy value in price score captures West-wide resource saturation effects
- Capacity value in price score captures diversity benefits for resources that complement PGE's existing resource portfolio
- Portfolio evaluation captures diversity benefits within portfolios under consideration

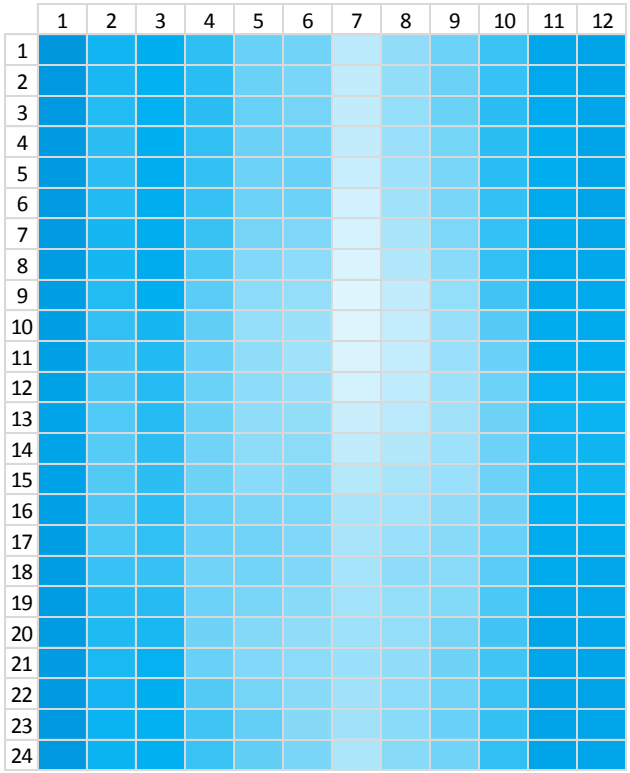
Portfolio Diversity – Energy Value

Price score reflects higher value for resources that generate during high priced hours (portfolio effects with region)

Market Prices



PNW Wind Output



Example:
25-yr PNW Wind

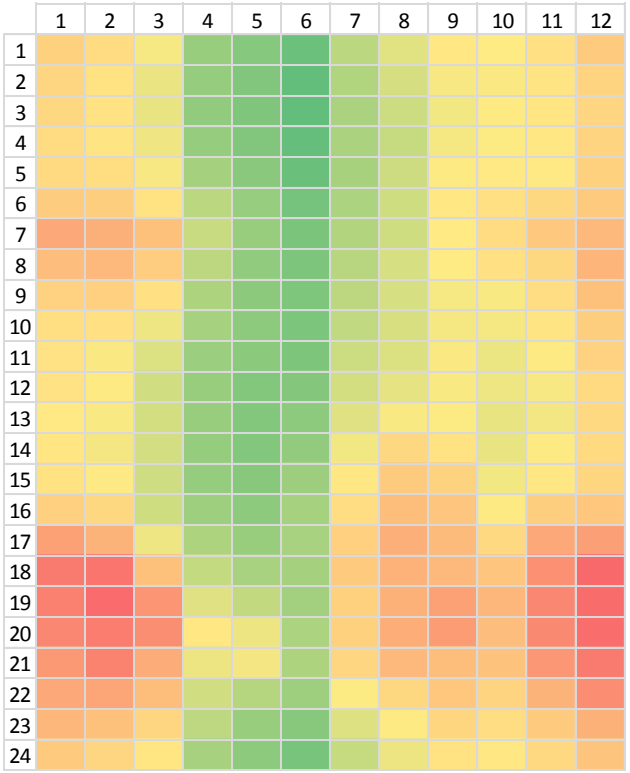
Energy Value
≈ $47/MWh

Wind energy value driven by seasonal and hourly trends

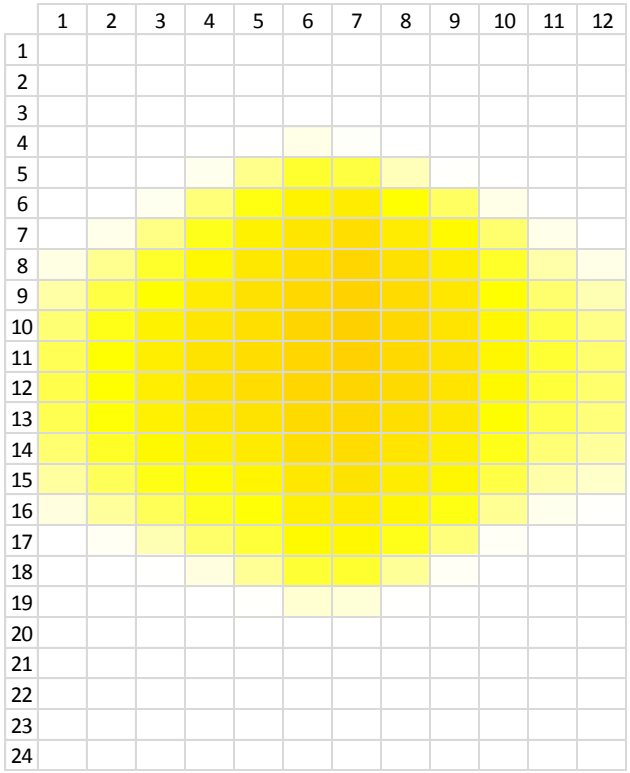
Portfolio Diversity – Energy Value

Price score reflects higher value for resources that generate during high priced hours (portfolio effects with region)

Market Prices



Solar PV Output



Example:
25-yr Solar PV

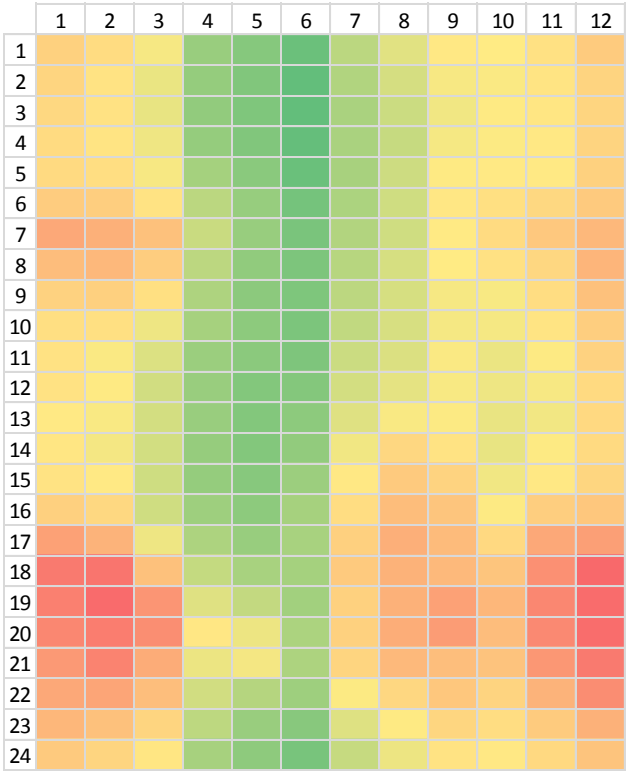
Energy Value
≈ $41/MWh

Solar energy value is negatively affected by mid-day price depression driven by solar development in California

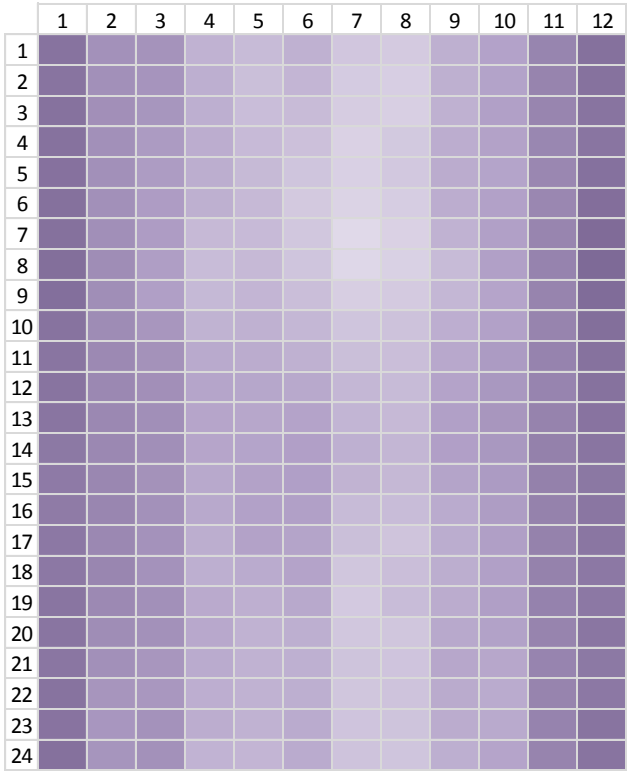
Portfolio Diversity – Energy Value

Price score reflects higher value for resources that generate during high priced hours (portfolio effects with region)

Market Prices



MT Wind Output



Example:
25-yr MT Wind

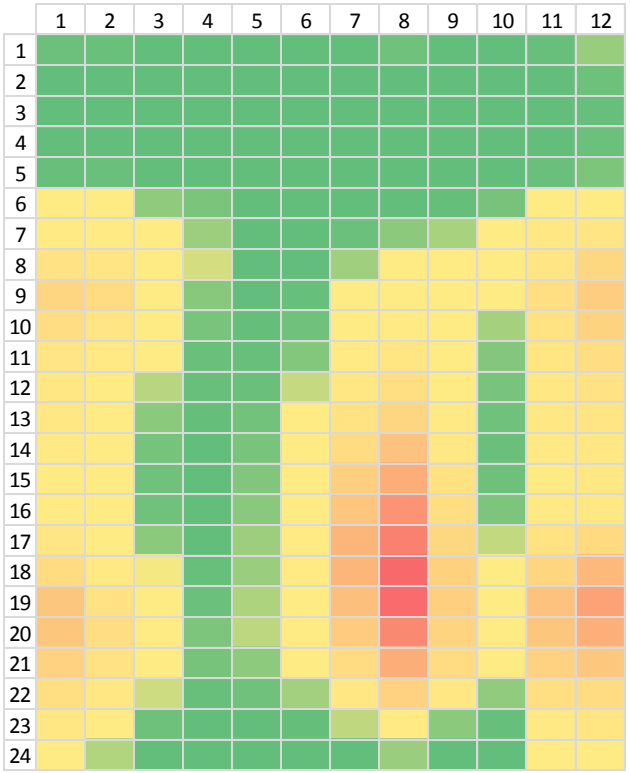
Energy Value
≈ $49/MWh

Montana wind has slightly higher energy value than PNW wind on a per MWh basis

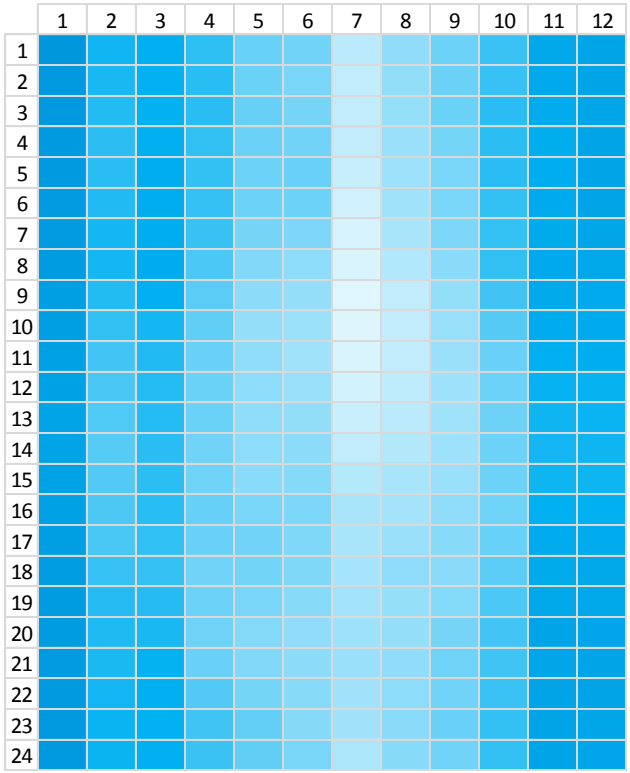
Portfolio Diversity – Capacity Value

Price score reflects higher value for resources that generate when other resources in the PGE portfolio do not (portfolio effects with PGE portfolio)

Loss of Load Hours



PNW Wind Output



Example:
100 MW of PNW Wind

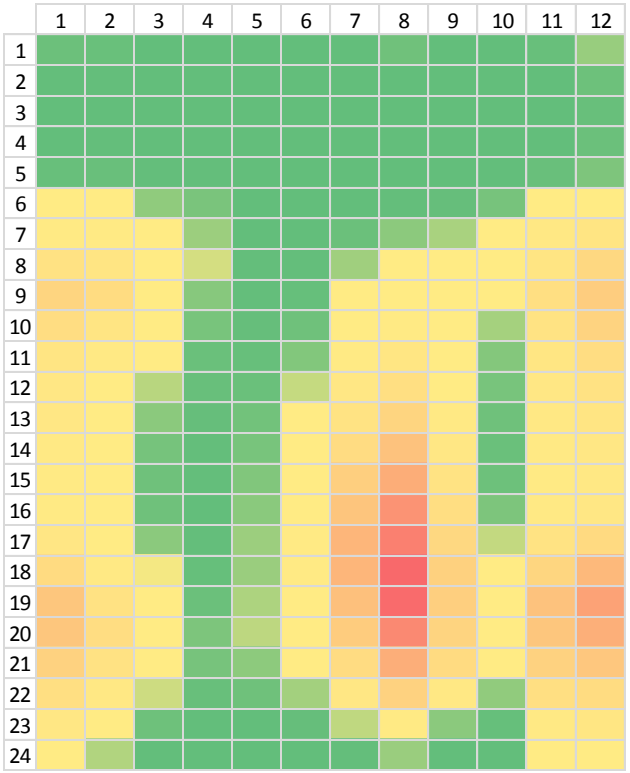
Capacity Contribution
= 19 MW

Capacity Value
≈ 19 MW x $120/kW-yr
≈ $2.3 million/yr
≈ **$8/MWh**

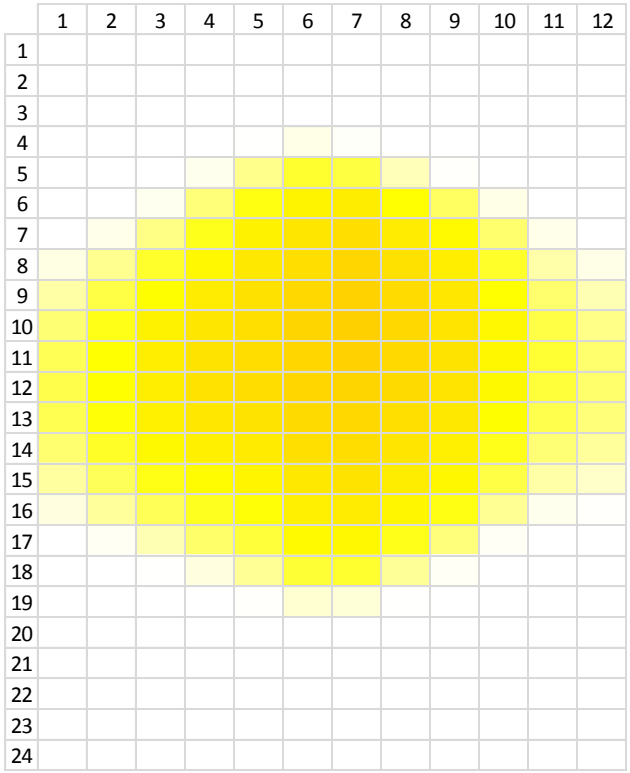
Portfolio Diversity – Capacity Value

Price score reflects higher value for resources that generate when other resources in the PGE portfolio do not (portfolio effects with PGE portfolio)

Loss of Load Hours



Solar PV Output



Example:
100 MW of Solar PV

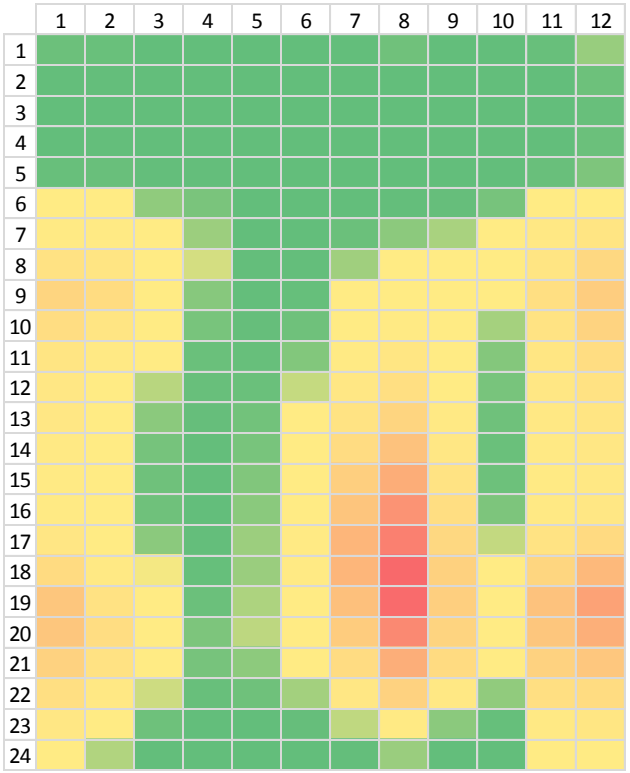
Capacity Contribution
= 15MW

Capacity Value
≈ 15 MW x $120/kW-yr
≈ $1.8 million/yr
≈ **$8/MWh**

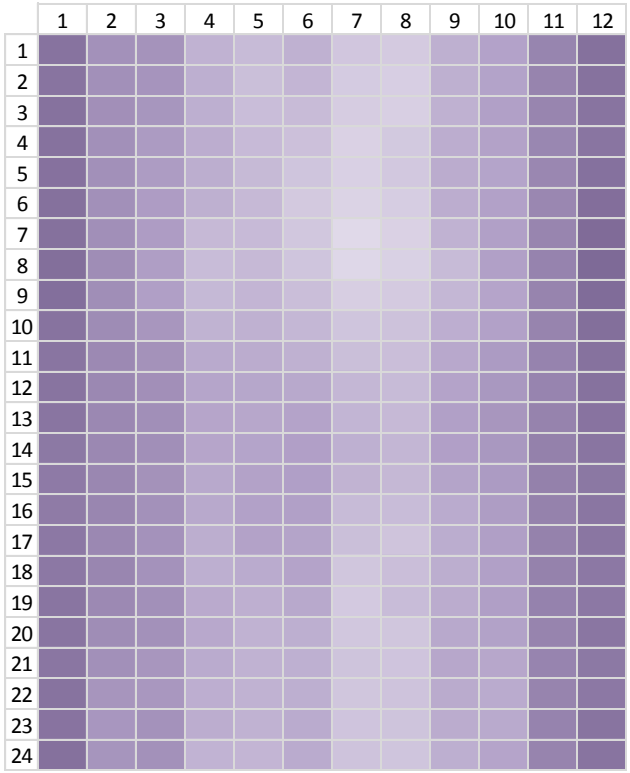
Portfolio Diversity – Capacity Value

Price score reflects higher value for resources that generate when other resources in the PGE portfolio do not (portfolio effects with PGE portfolio)

Loss of Load Hours



MT Wind Output



Example:
100 MW of MT Wind

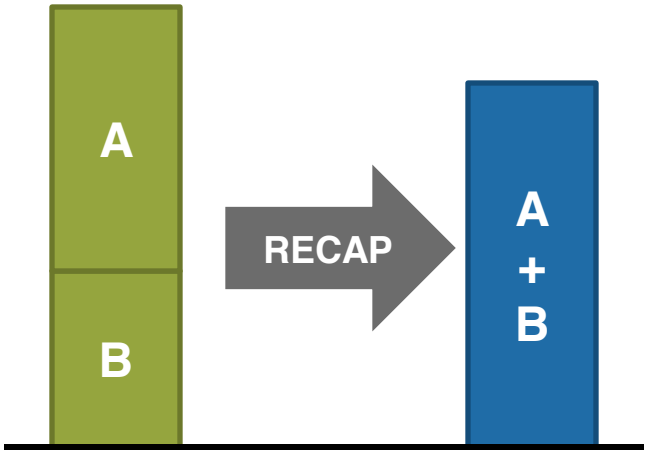
Capacity Contribution
= 39 MW

Capacity Value
≈ 39 MW x $120/kW-yr
≈ $4.7 million/yr
≈ **$13/MWh**

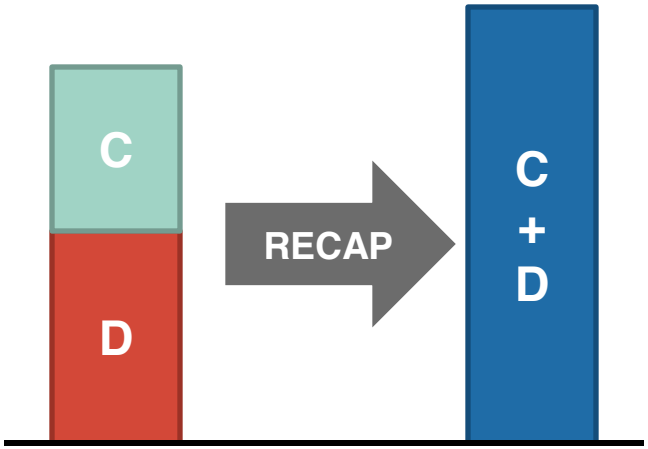
Portfolio Diversity – Portfolio Evaluation

PGE's incorporation of the RECAP model into the IRP and RFP portfolio evaluation captures additional diversity benefits within candidate portfolios

Portfolios of alike resources see declining marginal value



Portfolios of complementary resources see diversity benefits



Discussion

How can an RPS action enhance the diversity of PGE's portfolio?

- Does PGE's evaluation framework adequately capture reliability and economic diversity benefits?
- Are there any diversity benefits not captured by the methodology?
  - If so, how can they be captured?
- Other thoughts or feedback?

4. How can customers be protected against high cost outcomes?

Cost Containment

How can customers be protected against high cost outcomes?

Cost containment mechanisms in an RFP can be used to ensure that RPS-eligible resources under consideration are economically competitive with traditional capacity alternatives before accounting for REC value

Example:

Require the energy value + capacity value to exceed the levelized cost

This screen is equivalent to:

- *Resources with lower net cost than Generic Capacity in 2016 IRP*
- *Resources with cost benefit ratio less than 1 in PGE's Bilateral price scoring framework*

Cost Containment Examples

Proposed resource-specific cost effectiveness screen inherently accounts for diversity benefits

- Resources with higher value to PGE's portfolio have less strict cost screens

Resource	Energy Value ($/MWh)	Capacity Value ($/MWh)	Cost Effectiveness Screen ($/MWh)
	[1]	[2]	[3]=[1]+[2]
100 MW PNW Wind	~47	~8	**~54**
100 MW Solar PV	~41	~8	**~50**
100 MW MT Wind	~49	~13	**~62**

Discussion

How can customers be protected against high cost outcomes?

- How would the proposed cost containment mechanism potentially affect the outcome of an RFP?
- Are additional measures needed to ensure that procured RPS-eligible resources represent cost effective energy and capacity resources for customers?
- Are there any additional risks that need to be addressed with a cost containment mechanism?
- Other thoughts or discussion?

Additional stakeholder feedback?

PGE is seeking input from parties on how to design an RPS action that addresses concerns raised in the 2016 IRP

1. How would an RPS action address a near-term or medium-term need?
2. How can incremental near-term actions be grounded in a longer-term RPS compliance strategy?
3. How can an RPS action enhance the diversity of PGE's portfolio?
4. How can customers be protected against high cost outcomes?

Next Steps

PGE aims to report back to the Commission at the October 10th Public Meeting

Presentation will include:

- Summary of stakeholder engagement process to date
- Recap of the material presented at this workshop and stakeholder feedback
- Road map for the process going forward

2016 IRP Workshop #2
PGE's Revised Renewable Action

Portland General Electric | October 27, 2017

Safety Moment

Have a happy (and safe!) Halloween!

The CDC has provided key tips for keeping you and your kids safe on Halloween:

Swords, knives, and other costume accessories should be short, soft, and flexible.

Avoid trick-or-treating alone. Walk in groups or with a trusted adult.

Fasten reflective tape to costumes and bags to help drivers see you.

Examine all treats for choking hazards and tampering before eating them. Limit the amount of treats you eat.

Source:
https://www.cdc.gov/family/halloween/index.htm

Safety Moment

Hold a flashlight while trick-or-treating to help you see and others see you. WALK and don't run from house to house.

Always test make-up in a small area first. Remove it before bedtime to prevent possible skin and eye irritation.

Look both ways before crossing the street. Use crosswalks wherever possible.

Lower your risk for serious eye injury by not wearing decorative contact lenses.

Only walk on sidewalks whenever possible, or on the far edge of the road facing traffic to stay safe.

Wear well-fitting masks, costumes, and shoes to avoid blocked vision, trips, and falls.

Eat only factory-wrapped treats. Avoid eating homemade treats made by strangers.

Enter homes only if you're with a trusted adult. Only visit well-lit houses. Never accept rides from strangers.

Never walk near lit candles or luminaries. Be sure to wear flame-resistant costumes.

Source:
https://www.cdc.gov/family/halloween/index.htm

Today's Agenda

1. **Update on stakeholder engagement process and OPUC feedback**
2. **PGE's revised RPS Action proposal**
   - Describe key components at a high level
   - Near term need and longer term RPS strategy
3. **Cost minimization mechanisms**
   - Implementing a cost containment screen
   - Returning value of RECs to customers
   - Updated cost impact estimates
4. **Proposed schedule for regulatory process**

1. Update on stakeholder engagement process

Stakeholder Engagement

Productive dialogue and optimistic outlook for path forward

Direct Outreach

- PGE conducted 1-on-1 meetings with Staff and Stakeholders
  - Identified specific concerns to address
  - Solicited stakeholder feedback on potential options

PGE conducted meetings with OPUC Staff, CUB, RNW, NWEC, NIPPC, ICNU, Sierra Club, NRDC, Climate Solutions, Oregon Environmental Council

September 25th Workshop

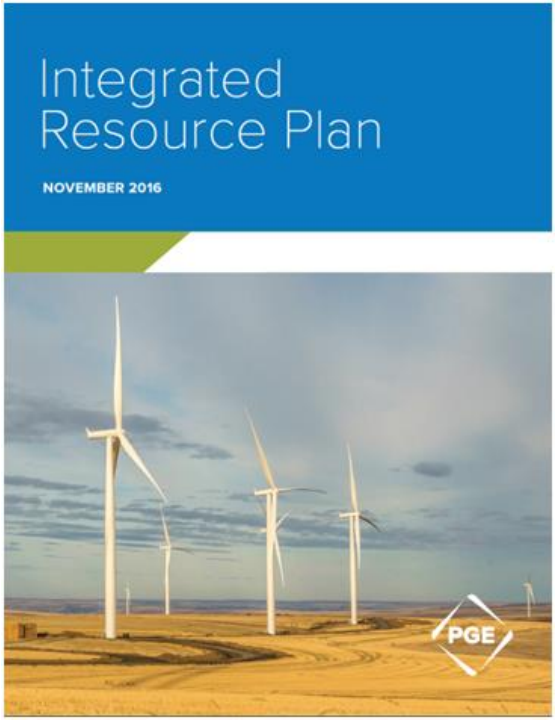
- Concepts:
  - Revised near-term renewable additions
  - Long-range renewables procurement strategies
  - IRP Addendum process
  - RFP methods to prevent high cost outcomes
  - RFP approaches to manage REC bank and reduce near-term costs

Renewables Action Plan Dialogue

Issues to be addressed in revised Renewable Action Plan

What we've heard from Stakeholders and OPUC:

- Procurement needs to be tied to 2016 IRP capacity and energy need
- Desire for longer range view of PGE's renewables procurement strategy (2030+)
- Preference for a layered approach and smaller near-term procurement target
- Customers should not pay for renewable attributes that are not needed to meet RPS compliance until 2029
- Near-term cost impacts for renewable resource additions should be minimized

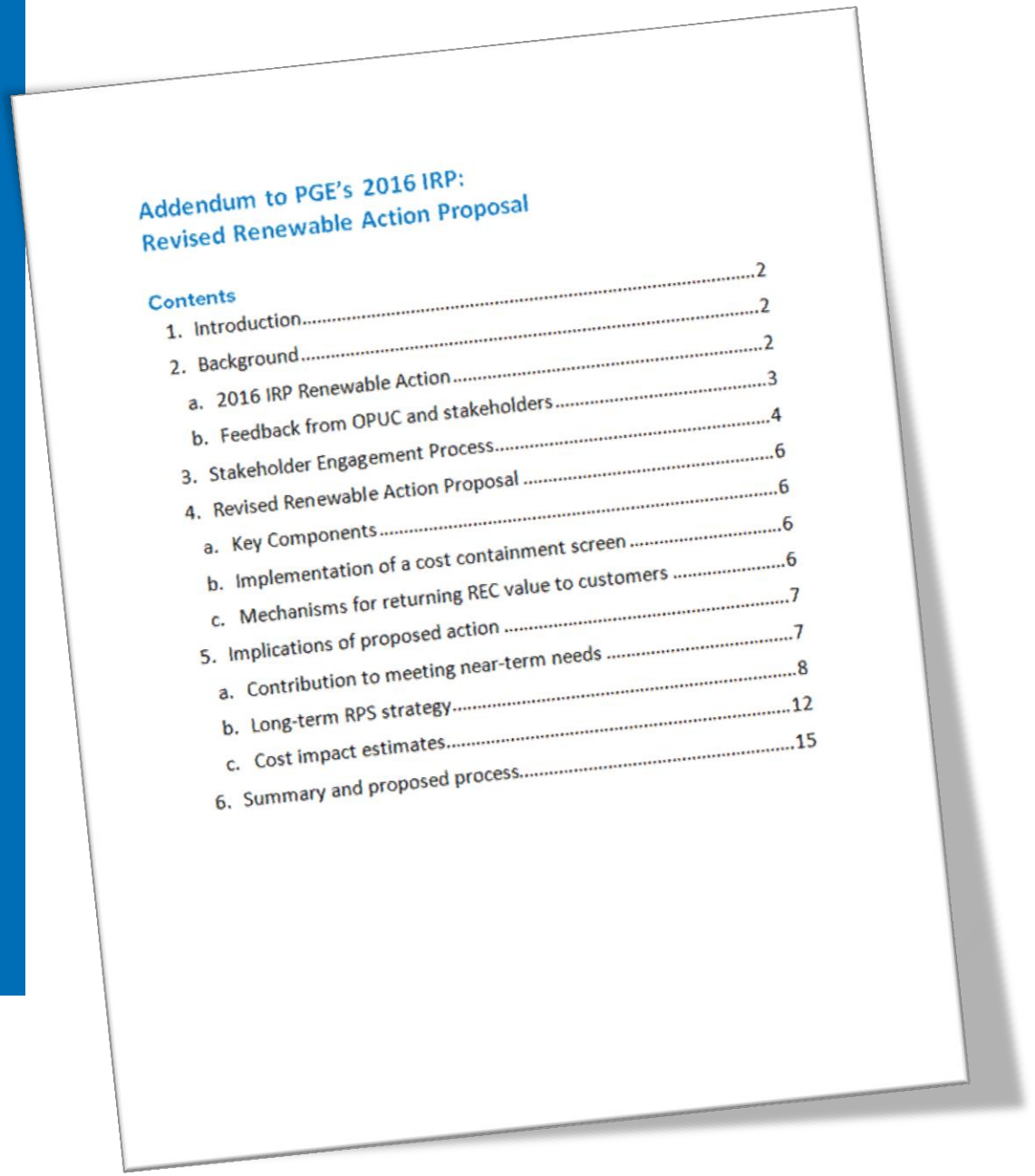


Developments since 1st RPS Workshop

- PGE reported on the stakeholder engagement process and potential themes in a revised proposal to the Commission at the October 10th Public Meeting
- PGE followed up with representatives of the bidder community regarding viability of new RFP structures
- PGE briefed environmental stakeholders on the process to date
- OPUC encouraged PGE to file an Addendum for formal review in a timely manner if the Company believes it has identified a compelling proposal

PGE is drafting an Addendum to the 2016 IRP and aims to file with the Commission in mid-November

Today we will discuss contents of draft filing and seek feedback on specific items



Addendum to PGE's 2016 IRP:
Revised Renewable Action Proposal

Contents

2. PGE's Revised Renewable Action proposal

Renewables: New Path Forward

Proposed path forward to address OPUC and Stakeholder concerns

Key Components of PGE's Revised Renewable Action Proposal
Timing and Need: PGE proposes to conduct an RFP for RPS-eligible resources that contribute to meeting PGE's energy and capacity needs by 2021.
Procurement Size: PGE proposes to modify the procurement target to 100 MWa, consistent with the Company's physical RPS needs in 2025 and multiple long-term glide paths to RPS compliance in 2040.
Cost Containment: PGE proposes that the Renewables RFP apply a bid-specific price screen, requiring that all resources included in the short list have real levelized costs that do not exceed their real levelized energy and capacity value.
Near-term REC Treatment: PGE commits to returning to customers the value associated with the volume of RECs procured prior to 2025 through this revised Renewable Action.

Principles:

Viable solutions must ensure continued electric service for PGE customers that is:

- Affordable
- Reliable
- Clean
- Safe
- Secure

PGE's Near-term Need

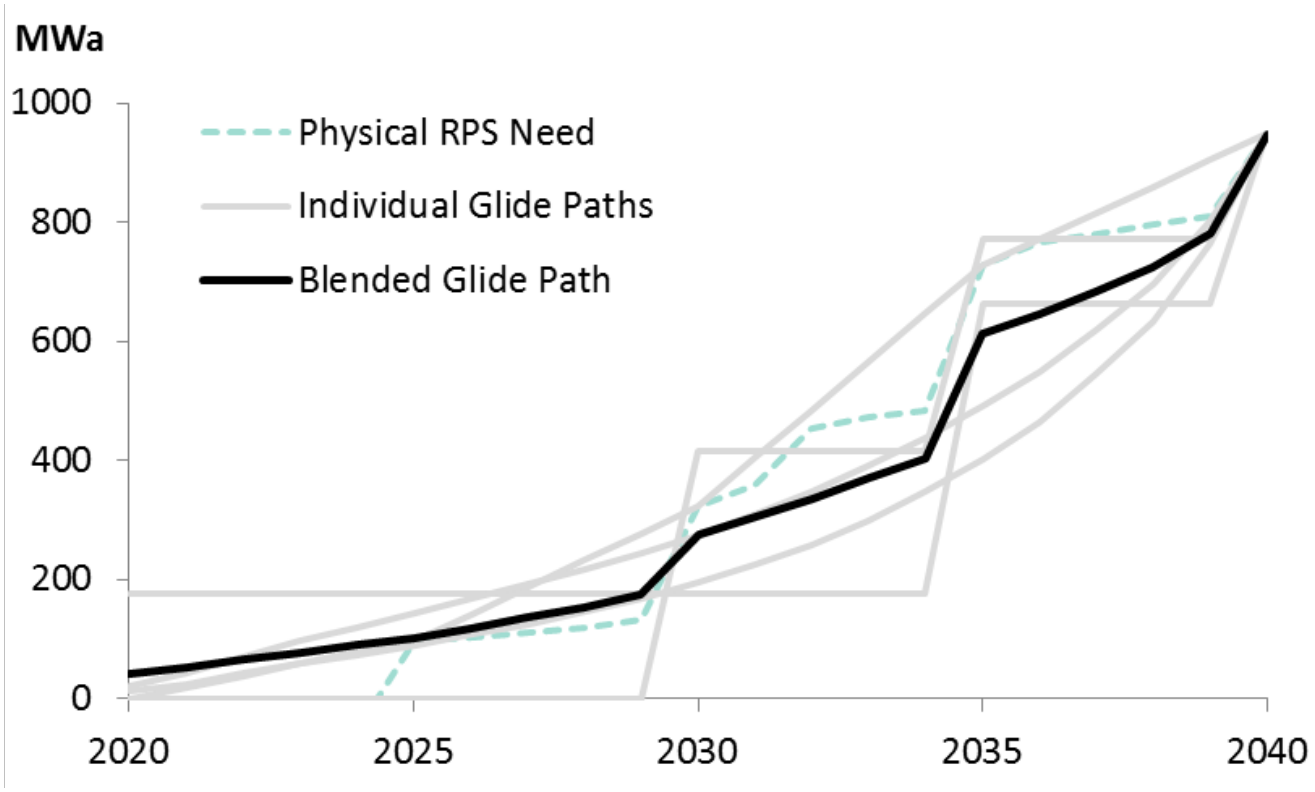
100 MWa of resources in the near-term would contribute to meeting PGE's energy and capacity needs.

	2021	2025	2030
RPS Compliance (MWa)			
Physical RPS Need	0	96	322
Minimum REC Need	0	0	322
Resource Adequacy (MW)			
Capacity Need	561	839	1,185
Energy (MWa)			
Energy Need	98	292	521
Market Purchases	107	420	768

- Numbers exclude potential impacts of bilateral negotiations.
- Bilateral negotiations are expected to provide 350-450 MW of capacity, are not explicitly seeking energy.

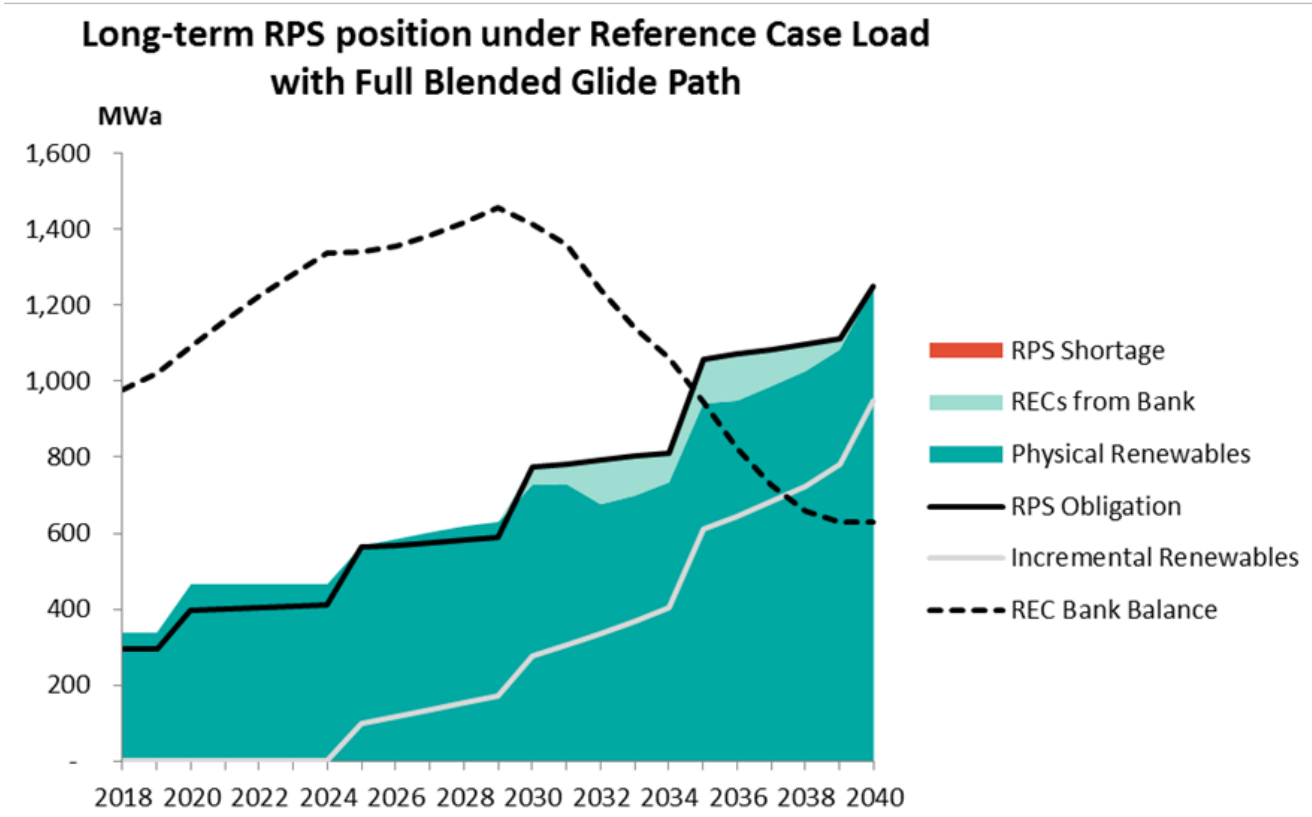
Glide Path to 2040

100 MWa by 2025 is consistent with the Company's 2025 physical RPS need and the Blended Glide Path



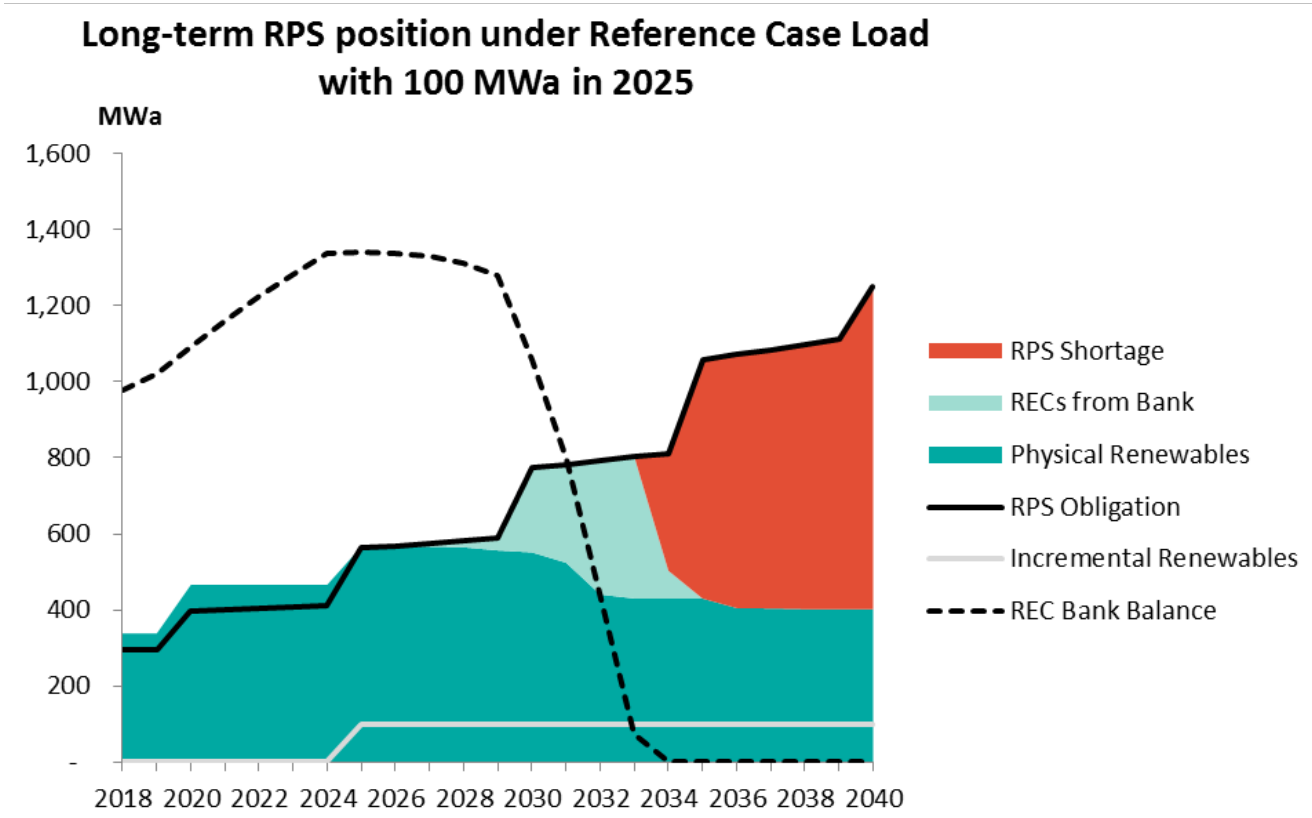
Glide Path to 2040

Blended Glide Path results in REC bank utilization for compliance in 2030-2039. REC bank falls just below minimum REC bank constraint by 2040.



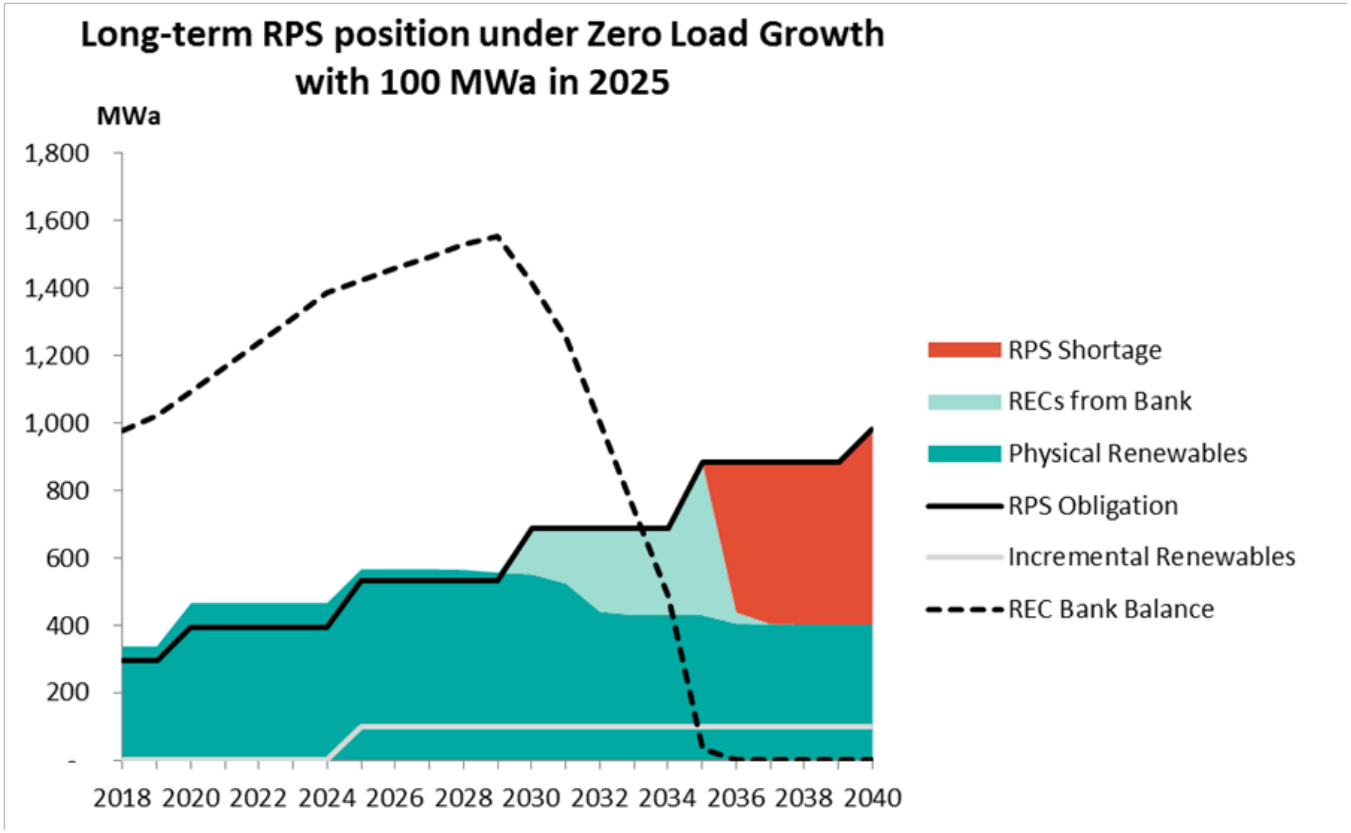
Mid-term Incrementalism

100 MWa by 2025 maintains 848 MWa of “head room” for incremental procurement through 2040 under Reference Load Forecast.



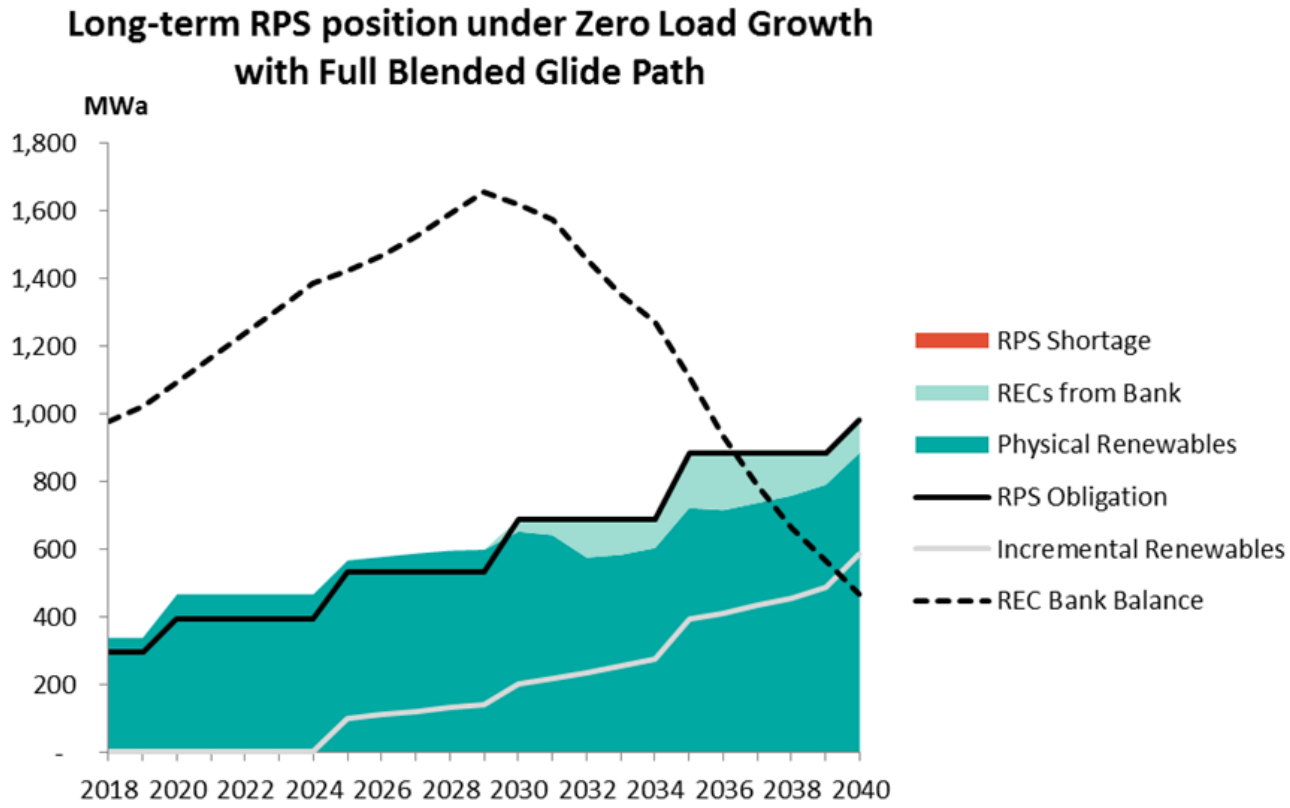
Load Forecast Sensitivity

100 MWa by 2025 maintains 581 MWa of “head room” for incremental procurement through 2040 under Zero Load Growth Sensitivity.



Glide Path Flexibility

100 MWa by 2025 does not preclude adjusted glide path if RPS obligations are lower than currently forecast.



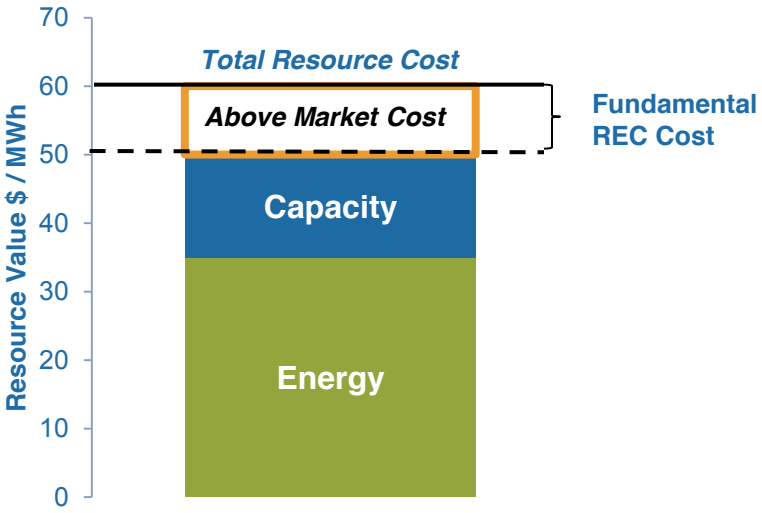
3. PGE's proposed cost minimization mechanisms

Cost Containment Concept

Renewable resources will be screened in the RFP to eliminate all non cost-effective resources.

- Expiring tax credits and favorable wind-turbine pricing is expected to result in low-priced renewable offers
- PGE will ensure renewable acquisitions cost less than the total energy and capacity value delivered by the resource
- Renewable resources passing the RFP cost threshold will have no 'above-market' costs and customers will pay no fundamental value to receive renewable energy credits

Example:



Cost Containment Methodology

Renewable resources will be screened in the RFP to eliminate all non cost-effective resources.

- All renewable resources deliver energy value, capacity value, and RECs.
- Within an RFP, PGE will quantify a resource's unique forecasted energy value, capacity value and generated REC volumes
- PGE will compare the resource's levelized cost to a resource's reference case levelized energy and capacity value (excluding REC value)
- Eligible bids' levelized costs must fall below resources' levelized energy and capacity value

Generic Resource Values – Reference Case

	Wind ($/MWh)	Solar ($/MWh)	MT Wind ($/MWh)
Energy Value	$ 46.61	$ 41.12	$ 48.87
Capacity Value	$ 7.65	$ 8.49	$ 12.71
Total	**$ 54.26**	**$ 49.61**	**$ 61.58**

Near-Term Cost Minimization

PGE commits to reducing near term cost impacts of renewables by returning REC value to customers prior to 2025

- PGE proposes eligible resources pass cost-based screen, and deliver associated RECs to PGE upon COD
- In years prior to 2025, PGE will extract maximum value from delivered RECs through either:

  Wholesale REC market sales: Bilateral sale to wholesale REC purchaser. Transaction reviewed by Commission through property sale filing.

  Retail REC sales: Retail sale of REC to PGE customer. Transaction reviewed by Commission through subsequent tariff review process.

  Compliance cost minimization*:* Use of REC to lower compliance cost of yet unknown carbon regulations. Compliance reviewed through IRP, power cost filing, and other future proceeding.
- Value extracted from RECs will be applied to lower customer power costs prior to 2025.
- Pre-2025 REC sales may favor banking of infinite life RECs and monetizing equivalent volume of 5-year RECs

Retail REC Sale Opportunity

Opportunity to realize value of REC sales would be enhanced by a review of green tariff policy

- Voluntary REC purchases under a green tariff may create significant value for cost-of-service customers selling RECs prior to 2025
- PGE continues to engage with non-residential customers to gauge interest in purchasing renewable energy bundled with associated environmental benefits

Cost Impact Estimates

PGE investigated both NPVRR and near-term cost impacts

Cost Metric	Utility-owned Wind	PPA Wind
NPVRR Impact (million $)	-$121	-$121
Year 1 net cost impact (% of revenue requirement)	+1.4%	+0.8%
2021-2024 average net cost impact (% of revenue requirement)	+0.4%	+0.3%

*Assumes both resources have the same levelized cost; PPA is assumed to have fixed real pricing structure (escalates with inflation); near-term costs reflect updated cost and performance data from DNV GL. Both resources would pass cost containment screen.

Cost Impact Estimates

Additional near-term cost reductions will depend on the value of RECs in the 2021-2024 time frame

REC Price or Value	Annual estimated net cost impact (% of revenue requirement)
$1/MWh	-0.04%
$3/MWh	-0.12%
$5/MWh	-0.20%

Additional Feedback?

- Key Components
- Price Screen Implementation
- Treatment of Near-Term REC Value

4. Proposed schedule for regulatory process

Proposed Addendum Schedule

PGE aims to file Addendum in a timely manner in order to:

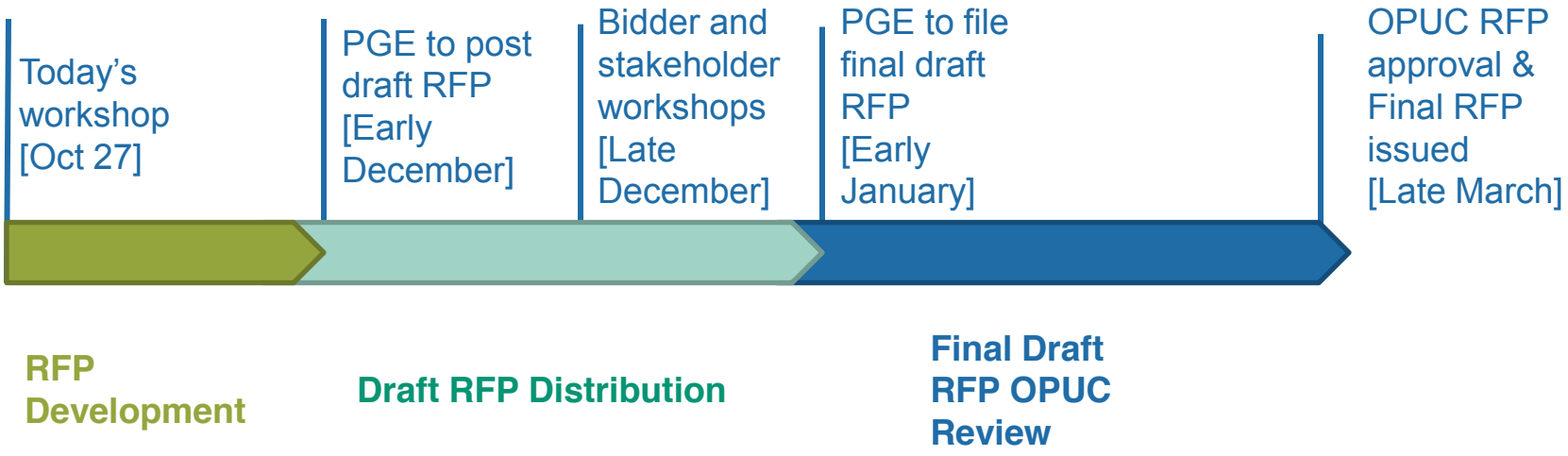
- Provide at least 30 days for comment
- Allow Commission to consider Addendum and Comments prior to the end of the year

In the interest of time, PGE does not plan to file comments unless additional clarification is needed in advance of the OPUC Public Meeting.

Proposed RFP Schedule

PGE proposes to begin RFP development in parallel with Addendum process

- Parallel process will allow for the greatest opportunity for RFP review while still allowing for capture of expiring federal tax credits



Additional Feedback?