

Integrated Resource Planning

ROUNDTABLE 22-1

JANUARY 2022



MEETING LOGISTICS



Electronic version of presentation:

<https://www.portlandgeneral.com/our-company/energy-strategy/resource-planning/integrated-resource-planning/irp-public-meetings>

Teams Meeting

Please click the meeting link sent to your email or here:

[Join Microsoft Teams Meeting](#)

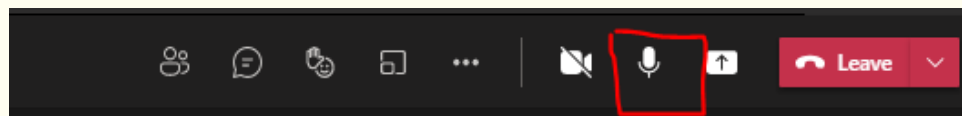
*Please use Microsoft Edge or Google Chrome with Teams as it will give you the best experience

Or +1 971-277-2317 (dial this number from your phone for best results)

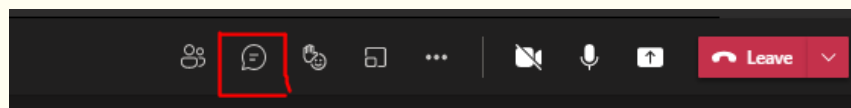
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PARTICIPATION

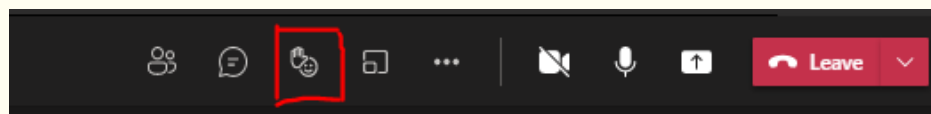
- Mute your mic while others are speaking; to unmute via phone press *6



- We will ask for comments and questions along the way
- Participate using the chat box or ask questions verbally



- Use the “raise hand” feature to signal you would like to ask your question verbally



- Wait to be called on
- Please be polite and respect all participants on the meeting
- Please stay on topic; we may interrupt or shorten questions to meet the time commitment of the meeting

AGENDA

Welcome and introductions	15 minutes
Safety moment	5 minutes
2022 kickoff	30 minutes
Clean energy plan	10 minutes
Climate adaptation study	10 minutes
Flexibility study	10 minutes
Portfolio requests from participants	5 minutes

SAFETY MOMENT

Winter driving

Colder months bring new risks to everyday activities. Accidents can easily happen, and preparedness is key. One way to prepare is to create a safety kit.

Keep in your car:

A blanket, gloves, and warm hat

Water and non-perishable snacks

Emergency flares

Flashlight

Jumper cables

Tire chains

A snowbrush and small shovel

If you need assistance during the winter with housing, heating costs, or employment Human Solutions supports our local community. Please reach out if you know someone in need of support.

[Human Solutions](#)



2022 KICKOFF

JESSICA GRAEBER
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IRP STAFFING UPDATES

Team updates

- Tomás Morrissey
- Anne Alenskis
- Melissa Swenson
- Nihit Shah
- Misty Gao
- Seth Wiggins

Communication

lrp@pgn.com

If you'd like to provide feedback on PGE's IRP or the IRP process, [fill out our form](#)

Emails and forms will reach our team and we will usually respond within a week if a specific questions is asked. If you are simply providing feedback for consideration we will respond to let you know your message was received

PUBLIC MEETING DATES 2022

<https://portlandgeneral.com/about/who-we-are/resource-planning/irp-public-meetings>

We will also offer "office hours" in the fall to create space to connect with specific groups or questions, the format will be decided later this year

If you know of organizations you think should be invited to our meetings, please forward our meeting invites or Let us know so we can reach out personally

January 6
February 3
March 10
April 14
May 19
June 30
July 21
August 18
September 15
October 20
November 16
December 15

*Dates subject to change

IRP SCHEDULE*



*approximate: dates subject to change

SCHEDULE DETAILS*

January-July 2022

Needs assessment

- Price & existing resource generation forecasts
- Market capacity assessment
- Capacity assessment
- DER study integration
- Customer program forecast
- Load forecast
- Coordination with ETO

Resource economics

- Supply side resource options
- Existing resources
- Fixed cost revenue requirement

*approximate: dates subject to change

SCHEDULE DETAILS*

July-December 2022

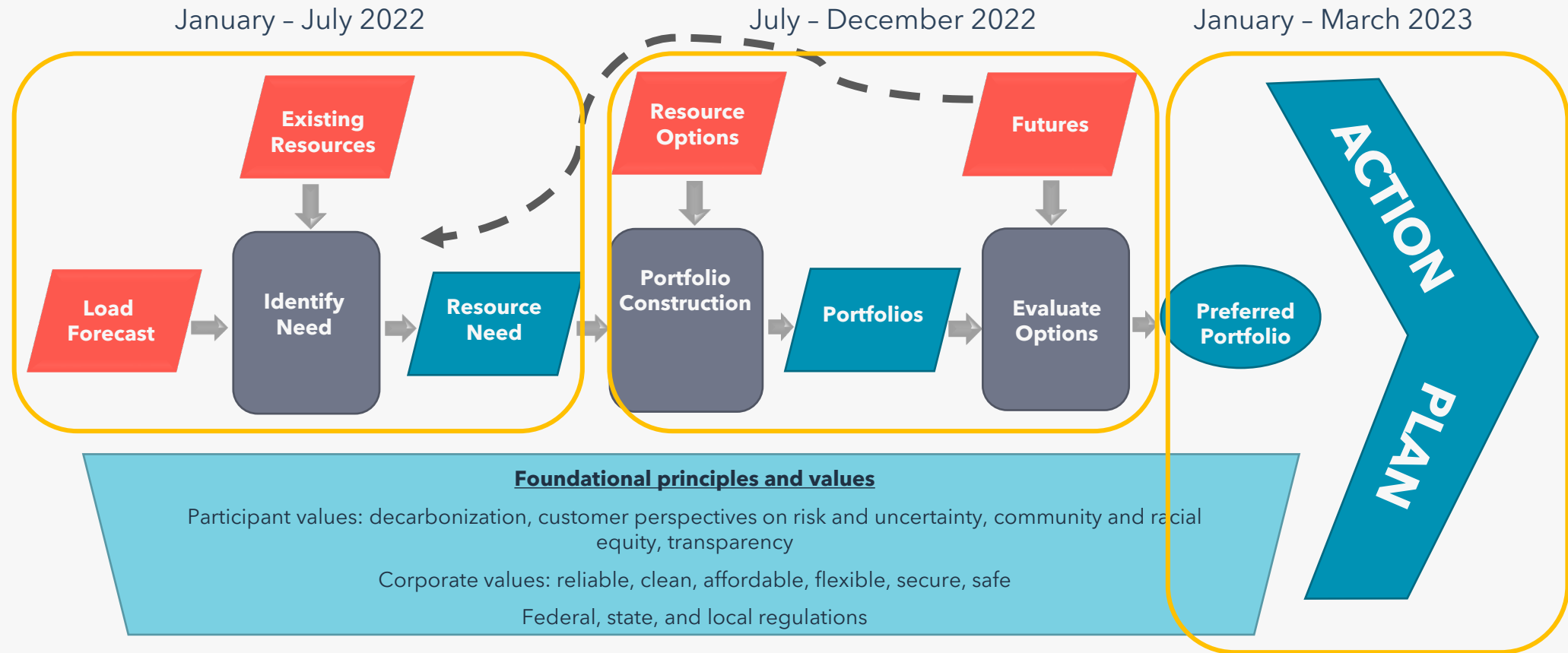
- Portfolio assessment
 - Portfolio scoring
 - Energy position assessment
 - RPS position assessment
 - Transmission enabling study
 - Hourly emission profile
- Preferred portfolio

January - March 2023

- Share draft IRP and action plan
- File final IRP
- Clean energy plan

*approximate: dates subject to change

IRP ANALYSIS PROCESS



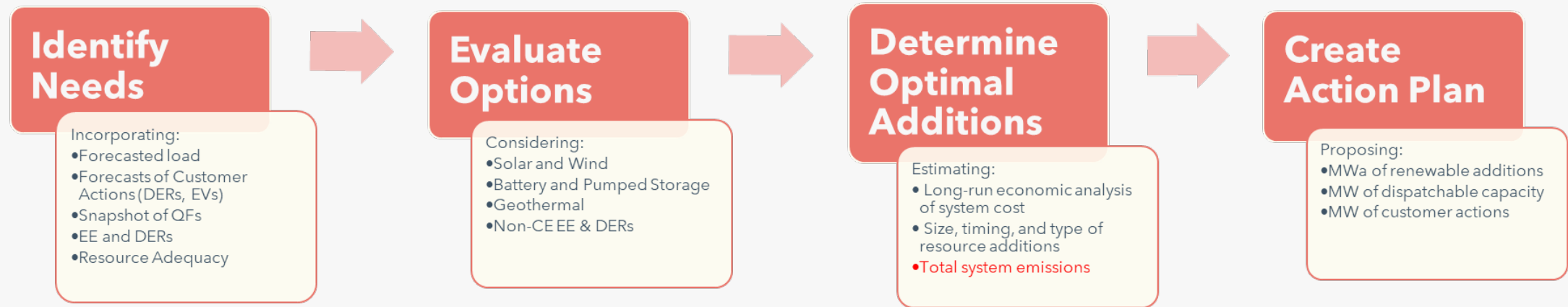
CLEAN ENERGY PLAN

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IRP PROCESS OVERVIEW



Each step listed above in the 2023 IRP must be compliant with HB2021
Most visibly, portfolio analysis adds a carbon constraint that impacts resource additions

HB2021 SECTION 4(4): CLEAN ENERGY PLAN

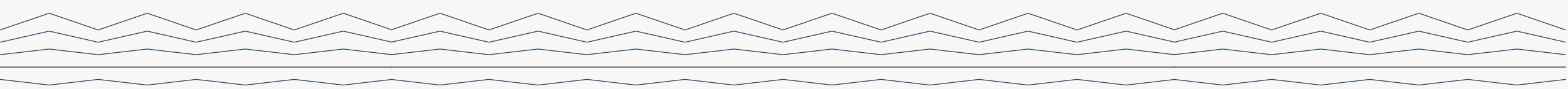
4) A clean energy plan must:

- (a) Incorporate the clean energy targets set forth in section 3 of this 2021 Act;
- (b) Include annual goals set by the electric company for actions that make progress towards meeting the clean energy targets set forth in section 3 of this 2021 Act, including acquisition of nonemitting generation resources, energy efficiency measures and acquisition and use of demand response resources;
- (c) Include a risk-based examination of resiliency opportunities that includes costs, consequences, outcomes and benefits based on reasonable and prudent industry resiliency standards and guidelines established by the Public Utility Commission;
- (d) Examine the costs and opportunities of offsetting energy generated from fossil fuels with community-based renewable energy;
- (e) Demonstrate the electric company is making continual progress within the planning period towards meeting the clean energy targets set forth in section 3 of this 2021 Act, including demonstrating a projected reduction of annual greenhouse gas emissions; and
- (f) Result in an affordable, reliable and clean electric system.

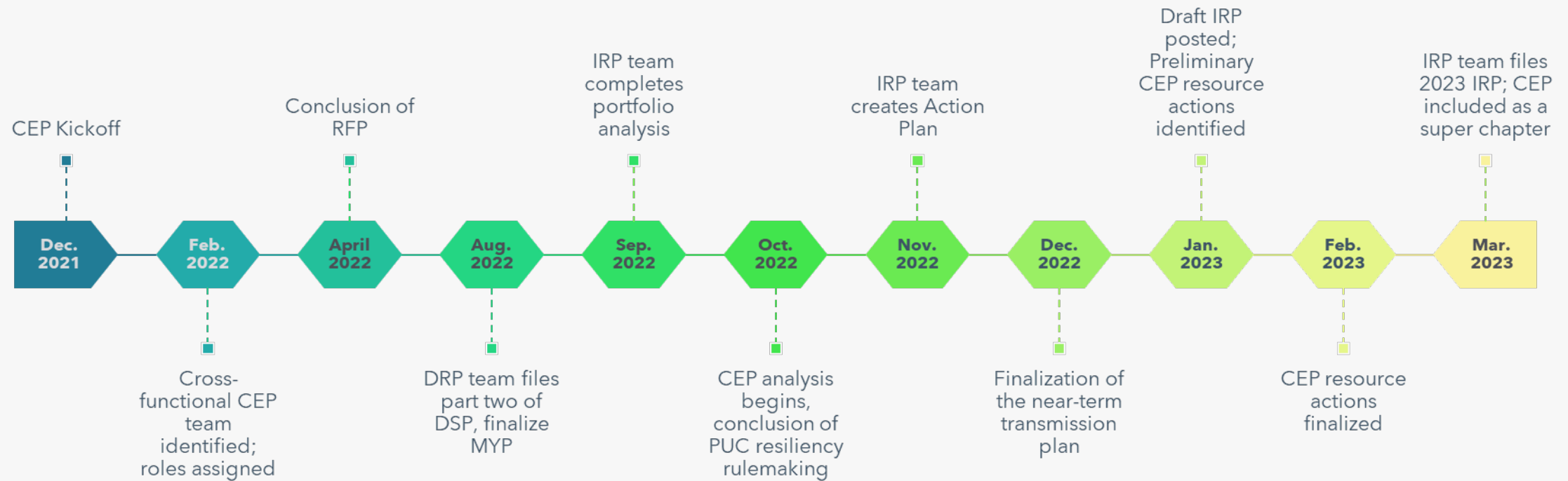
HB2021: PUC ACKNOWLEDGEMENT

Section 4: (6) The commission shall ensure that an electric company demonstrates continual progress as described in subsection (4)(e) of this section and is taking actions as soon as practicable that facilitate rapid reduction of greenhouse gas emissions at *reasonable costs* to retail electricity consumers.

Section 5: (2) The Public Utility Commission shall acknowledge the clean energy plan if the commission finds the plan to be in the public interest and consistent with the clean energy targets set forth in section 3 of this 2021 Act. In evaluating whether a plan is in the public interest, the commission shall consider:

- (a) Any reduction of greenhouse gas emissions that is expected through the plan, and any related environmental or health benefits;
 - (b) The economic and technical feasibility of the plan;
 - (c) The effect of the plan on the reliability and resiliency of the electric system;
 - (d) Availability of federal incentives;
 - (e) Costs and risks to the customers; and
 - (f) Any other relevant factors as determined by the commission.
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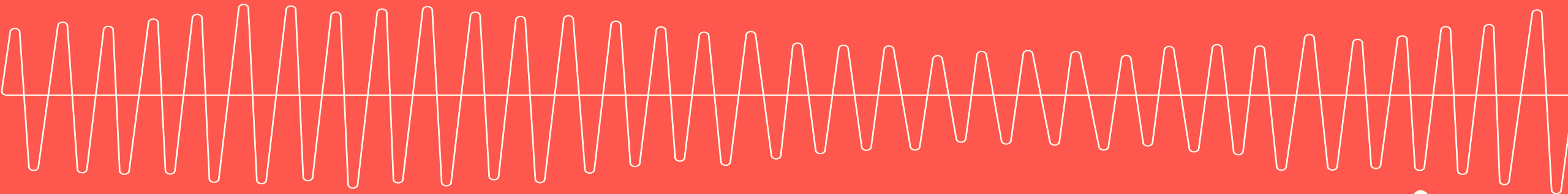
DRAFT CEP PROCESS AND TIMELINE



CLIMATE ADAPTATION STUDY

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INCORPORATING A CHANGING CLIMATE

Climate change has been an important component of PGE's planning. In the May 2020 Roundtable meeting, we discussed previous IRP's climate work:

2016 IRP: PGE commissioned OSU's Oregon Climate Change Research Institute (OCCRI) to evaluate potential coming impacts to weather (temperature, precipitation, and streamflows)

2019 IRP: PGE commissioned Evolved Energy Research to evaluate economy-wide deep decarbonization in the energy sector

Additionally, Since the 2018 GRC (UE 335) PGE's load forecast has included a trended-weather assumption

- Increased long-term energy model temperature inputs by a linear trend starting in 1975 and continuing forward

In the 2019 IRP docket (LC 73) PGE committed to conduct a climate adaptation study in the next IRP

PGE's CLIMATE ADAPTATION STUDY

Climate Mitigation: Reducing emissions (to mitigate the impacts of climate change)

Climate Adaptation: Altered behaviors due to a changing climate's effects (adapting to new reality)

The emission reduction targets of HB2021 (as well as PGE's corporate goals) ensure that PGE's IRP will be focused on mitigation

PGE will also be investigating adaptation. Specifically, PGE seeks to answer:

Best practices: What can we learn about climate adaptation from other utilities/institutions?

Resource Demand: How could customer loads change given a changing climate?

Resource Supply: How could climate change affect generation availability change?

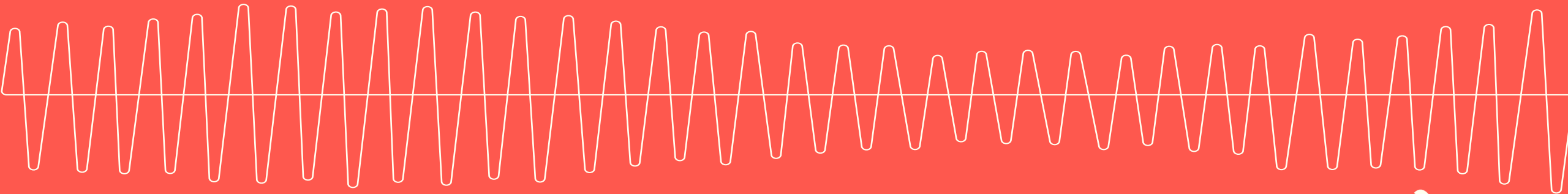
And finally, given the answers to these three questions, how should PGE's long-term planning change?

To this end, PGE has retained Creative Renewable Solutions to develop our Climate Adaptation Study

FLEXIBILITY STUDY

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FLEXIBILITY STUDIES

'Flexibility' describes the ability of an electricity system to respond to rapid supply or demand changes

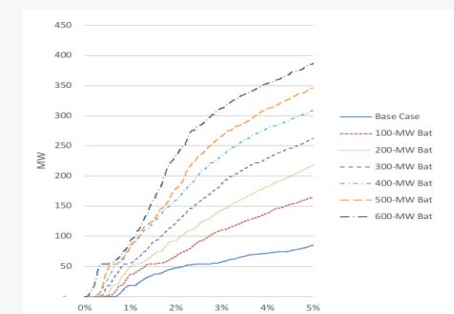
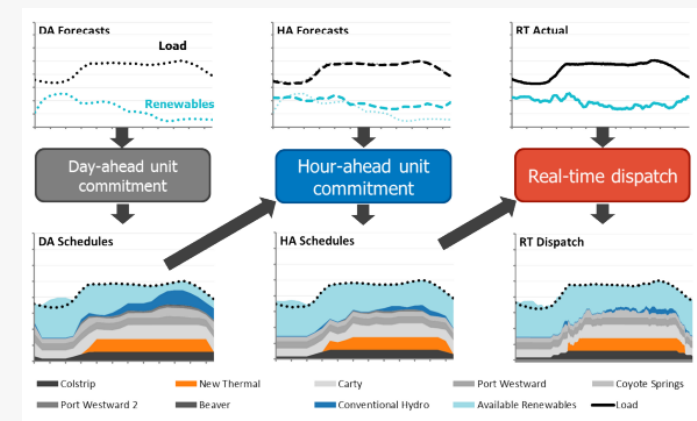
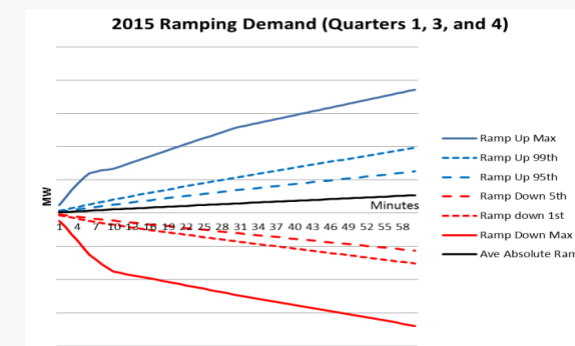
- System flexibility grows in importance as the share of renewables grow
- Dispatchable capacity (either from S/CCCT or battery storage)

In previous IRPs, PGE has evaluated the flexibility in a variety of ways

- 2013 IRP: Quarterly analysis of ramping ability in 2015 & 2020
- 2016 IRP: PGE worked with E3 (using REFLEX)
- 2019 IRP: PGE worked with Blue Marble Analytics (using ROM)

For the 2023 IRP, PGE has again retained Blue Marble Analytics

- Flexibility Adequacy (will create estimates of dispatchable capacity need)
- Estimation of integration costs and flexibility value
- Results expected by early summer 2022



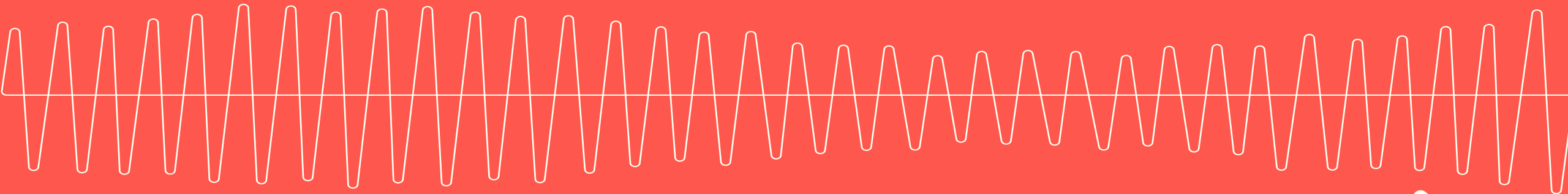
QUESTIONS/ DISCUSSION?



PORTFOLIO REQUESTS FROM PARTICIPANTS

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PORTFOLIO REQUESTS

- Our portfolio optimization model ROSE-E has flexibility to evaluate specific resource/size/year combination
 - For example, we could estimate the portfolio effects of adding 235 MW of SE Washington wind in 2036 and/or 150 MW of 6-hr batteries in 2026
 - In the 2019 IRP, we used this capability to evaluate the size and timing of 16 different renewable additions MW/year combinations
- We are open to suggestions for portfolio questions to be evaluated
 - Please contact us (email: IRP@PGN.com) or [fill out our form](#)

NEXT STEPS

A recording from today's webinar will be available in one week

Upcoming Roundtables:

February 3

March 10

April 14

May 19

June 30

July 21

August 18

September 15

October 20

November 16

December 15



THANK YOU

CONTACT US AT:
IRP@PGN.COM

APPENDIX A: PORTFOLIO REQUESTS

List of received requests on the following slides

PORTFOLIO REQUESTS

List of received requests

- A portfolio with Montana Wind and Montana Pumped Storage Hydro sharing PGE's Colstrip transmission rights. The resource mix would be roughly 300 MW of wind and 100 or 150 MW of PSH sharing roughly 300 MW of transmission rights.
- 300 MW of Montana wind using PGE's repurposed Colstrip transmission.
- Portfolio #1 - 100 MW of MT pumped storage hydro sharing repurposed Colstrip transmission with 300 MW of MT wind.
- "Clean Flex Portfolio" which considers only a mix of renewables, hybrids (solar/wind paired with 2, 4 and 6-hour batteries), standalone battery storage (2, 4 and 6-hour Li-ion BESS) and pumped hydro storage (8 to 12 hours) in addition to available demand response and energy efficiency programs. No new natural gas power plants should be allowed to be built in this portfolio.
 1. Maximize renewable and hybrid additions in the near-term (@025) to tap into the ITC and PTC extensions.
 2. Select at least 400 MW of standalone battery storage resources by 2028 (2, 4 and 6-hour durations)
 3. Select at least 250 MW of Pumped-Hydro (Swan Lake) starting 2026 or 2027.
 4. No addition of new natural gas/biofueled power plants.

PORTFOLIO REQUESTS

List of received requests

- Portfolio #2 - Additional MT wind above 300 MW. The Montana Renewables Development Action Plan (2018) identified transmission upgrades on the Colstrip and BPA transmission systems that could move additional renewable resources from eastern or central Montana to Mid-C. Although these upgrades are more expensive than existing transmission, they may be cost effective given the competitive advantages of Montana wind.
- Do not consider biomass or biofuel-based power plants as "non-emitting" (although it may be renewable).
- In response to PGE's request for feedback on the types of resource portfolios we would like to see evaluated in this IRP cycle, we encourage the utility to evaluate additional portfolios that assess potentially limited availability of hydropower within PGE's resource mix. First, we urge PGE to evaluate a 100% renewable resource portfolio that excludes legacy hydropower by 2040. Second, we urge PGE to evaluate a 100% renewable resource portfolio that reduces available hydropower by 50% by 2040. Modeling these resource portfolios through ROSE-E will help PGE and stakeholders identify potential constraints and impacts from possible reductions in hydropower availability as the utility decarbonizes its resource mix. These portfolio analyses will also help PGE evaluate uncertainties that may arise during the IRP period, including the potential for increased environmental and operational constraints on the Northwest hydropower system, the possible removal of dams, and/or greater hydropower variation resulting from unpredictable climate conditions.

PORTFOLIO REQUESTS

List of received requests

- Portfolios that meet emissions reductions required by HB 2021
 1. Two portfolios that meet the emissions reductions required by HB 2021
 - One in which 50% of new renewables are built in the state of Oregon
 - One in which there is no in-state new renewables requirement
 2. One portfolio in which 75% of new renewables are built in Oregon
 - 75% MWh solar, 25% MWh wind
- Portfolios that meet President Biden's national proposal for 50-52% GHG reduction (from 2005 levels) by 2030 and a carbon-pollution free power sector by 2035