

Integrated Resource Planning

Roundtable 18-7

December 19, 2018



Meeting Logistics



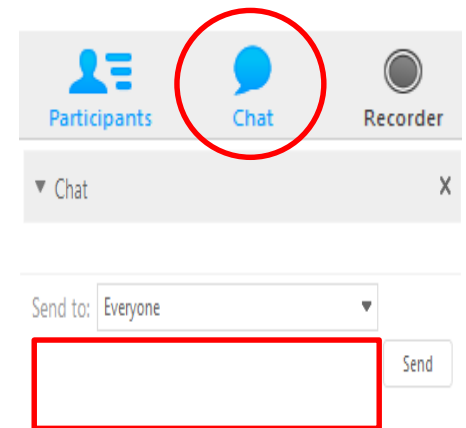
Local Participants:

- World Trade Center facility
- Wireless internet access
 - Network: 2WTC_Event
 - Password: 2WTC_Event\$
- Sign-in sheets

Virtual Participants:

- Ask questions via 'chat' feature
- Meeting will stay open during breaks, but will be muted
- Electronic version of presentation:
portlandgeneral.com/irp

>> *Integrated Resource Planning*



AGENDA

- ❑ Transmission access to Montana Wind resources
- ❑ Other transmission-related comments & questions
- ❑ Distribution Resource Planning



Winter Driving Preparedness



Vehicle Prep

Fill wiper fluid
Check tire pressure

Montana Transmission Access

Shaun Foster, Senior Analyst,
Transmission & Market Services



Discussion Topics

- **Background**

- Brief Overview of Colstrip Transmission System (CTS)
- CTS and Montana Intertie
- NW Transmission System

- **Montana Renewables Development Action Plan (MRDAP)**

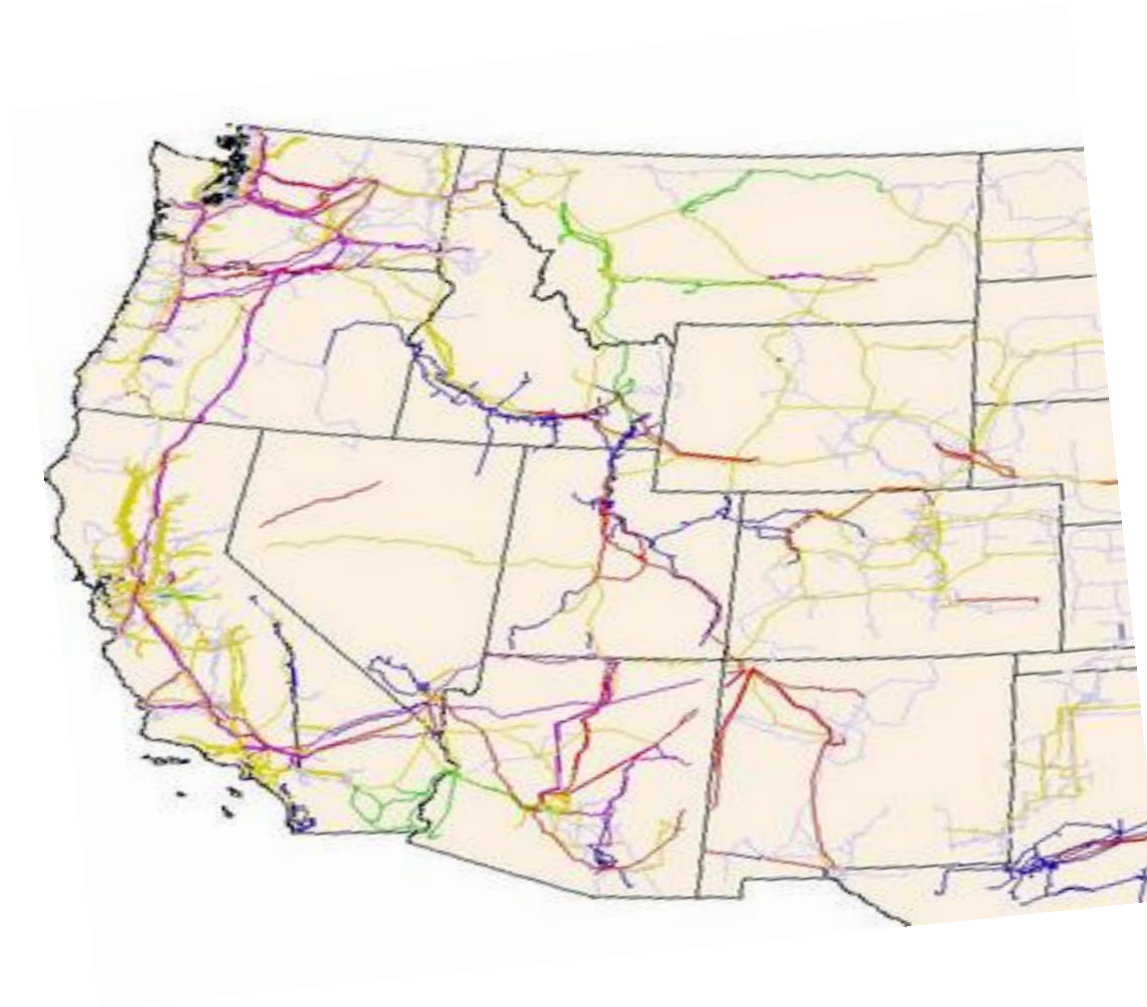
- Recent MRDAP Update
- Ongoing Discussions

Standards of Conduct

Separation of Functions

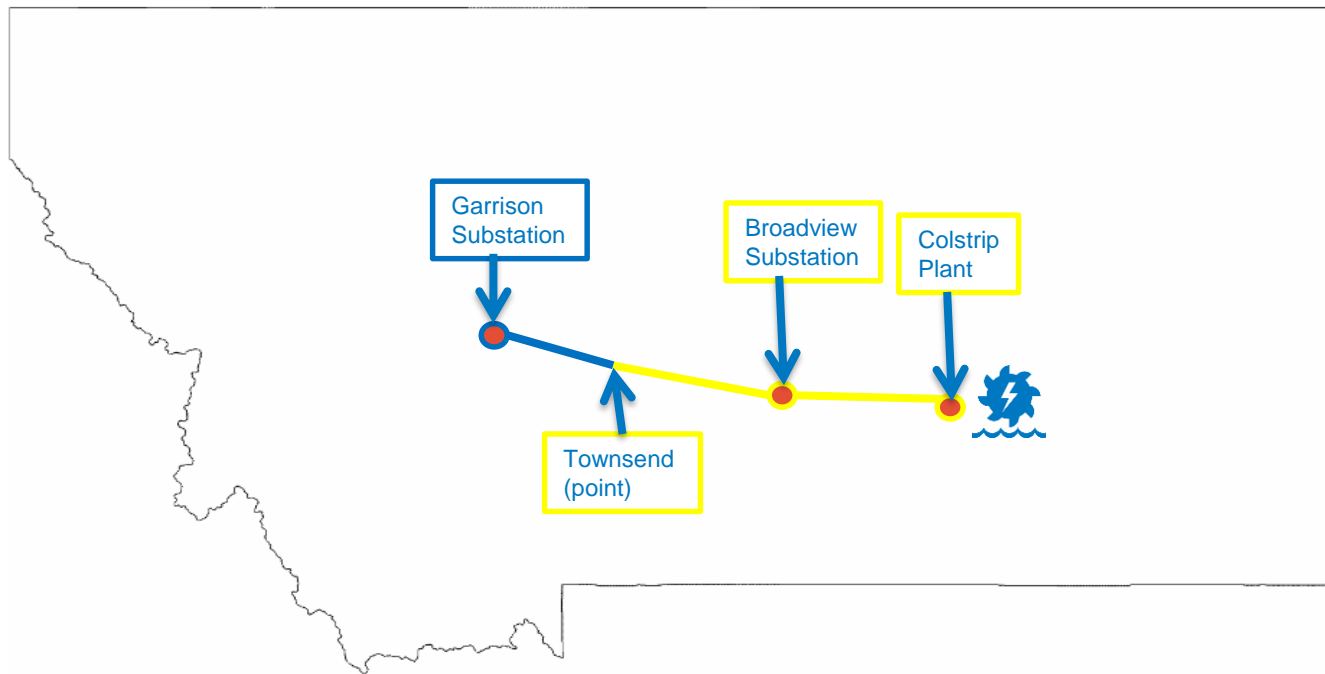
- FERC Standards of Conduct require the separation of functions for Public Utilities (FERC Term that generally refers to IOUs)
- Transmission Function vs. Marketing Function
- Limits what information Transmission Function Employees can share
- Requires treatment of Transmission Customer information as confidential

CTS & Montana Intertie Location



CTS and Montana Intertie

Approximate location



Montana Transmission

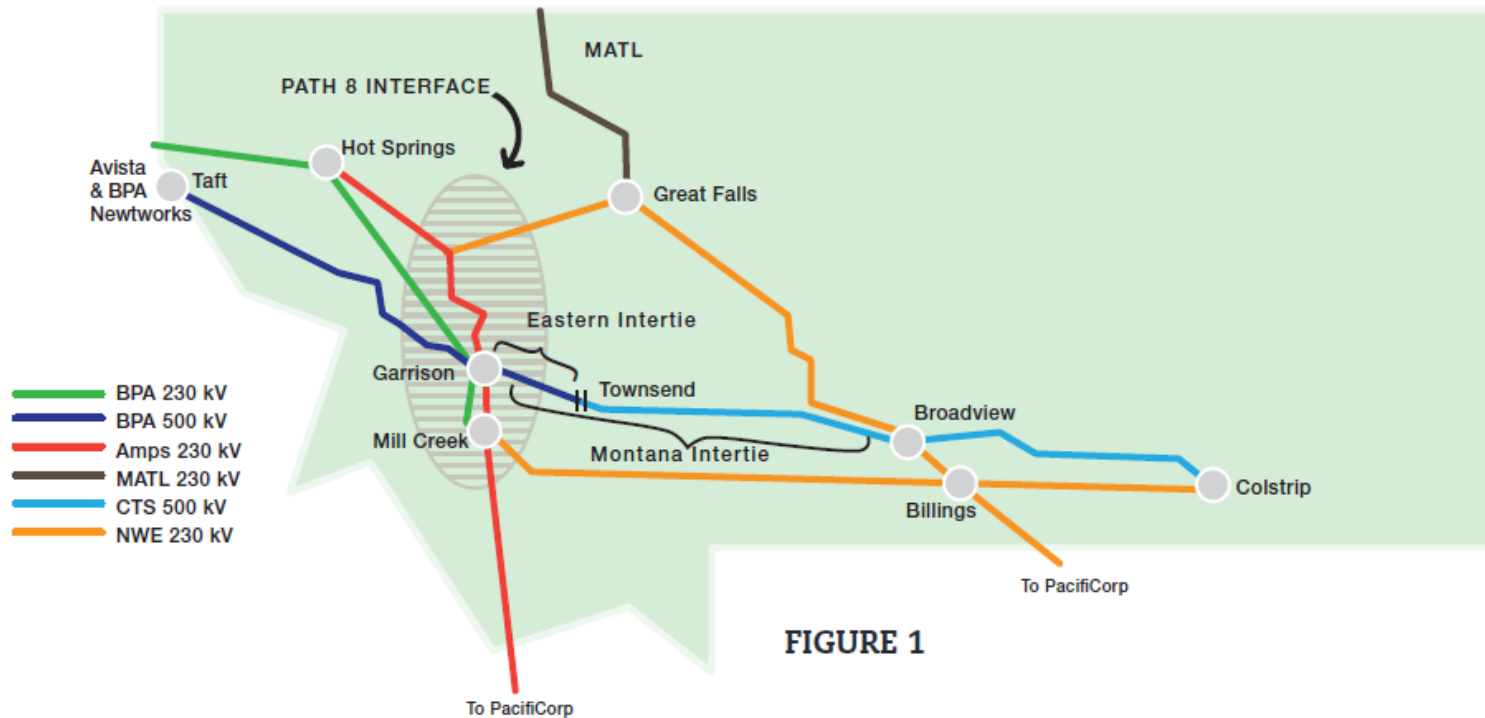


FIGURE 1

Image from MRDAP Report June, 2018

CTS Overview

- Two 500kV transmission lines, approximately 250 miles
- Co-owned by (5) different utilities
 - Northwestern Energy
 - Puget Sound Energy
 - Portland General Electric
 - Avista
 - PacifiCorp
- Delivers output of Colstrip generating plants from central Montana to interface with BPA's transmission system in western Montana
- Generally, transmission on CTS is fully subscribed (some minor exceptions)

Colstrip Transmission Agreement

- Originally executed in 1981 and filed with FERC as a grandfathered contract
- Provides for:
 - Ownership of facilities, ownership of transmission rights
 - Operation by a single owner as “Designated Operator”
- Amended to address Interconnection Service:
 - FERC required amendments to clarify process for interconnection requests
 - Interconnection requests must be made to all (5) CTS owners
 - Each owner is required by contract to have CTS interconnection procedures posted on their public OASIS sites.

CTS Ownership

Company	Colstrip to Broadview	Broadview to Townsend
Northwestern Energy	36%	24%
Puget Sound Energy	33%	39%
Portland General Electric	14%	16%
Avista Corp	10%	12%
PacifiCorp	7%	8%

Relationship Among Owners

- 5 Companies of varying sizes and locations
- 5 different Open Access Transmission Tariffs
 - each company provides Colstrip transmission under their own OATT
- 3 members of Norther Tier Transmission Group (NTTG)
- 2 members of Columbia Grid
- 11 state Public Utility Commissions, consumer advocacy groups, and other stakeholders

Montana Intertie Agreement

- Originally executed in 1981 and filed with FERC as a grandfathered contract
- Includes BPA's obligation to construct, own, and operate the Townsend-Garrison 500kV circuit
- Details parties' transmission capacity allocations, associated costs, and what energy can be moved on intertie
- (6) parties to the agreement
 - Bonneville Power Administration, Northwestern Energy, Puget Sound Energy, Portland General Electric, Avista, PacifiCorp
- Disallows use of Garrison as a scheduling point for all but Northwestern Energy

Montana Renewable Development Action Plan



Montana Renewables Development Action Plan (MRDAP)

- Jointly sponsored effort by BPA and the State of Montana governor's Office
- Kicked off in December 2017 and final report issued June 30, 2018
- Intended to explore barriers, both physical and in process, facing renewables development in Montana
- The effort brought clarification to existing facts, highlighted existing unused available transmission capacity, and identified future opportunities to simplify access and provide solutions to potential barriers
- MRDAP comprised of three different sub-committees (Commercial/Policy, Operations, Planning). PGE participated in all three
- Updated quarterly – last update happened in October; next scheduled for January

MRDAP Key Findings

- Significant transmission capacity currently exists to exit Montana
- May be opportunities to update the CTS Agreement and Montana Intertie Agreement (MIA) to allow third party access and improve loss calculations
- CTS, Intertie, Path 8 will likely be able to maintain similar TTC (total transfer capability) ratings after Colstrip Plant closes
- Significant incremental transmission capacity exiting Montana can be realized with construction of currently identified projects
 - Remedial Action Scheme (RAS)
 - CTS Upgrade
 - Montana to Washington (M2W)
- Significant DTC (dynamic transfer capability) can be made available by BPA to support the dynamic scheduling of renewables to the west

Available Transmission Capacity

	East of Garrison	West of Garrison	West of Hatwai
NWE to AVA to Mid-C	297	297	297
NWE to BPA	246	0	0
Montana Intertie	184	0	0
BPA RAS Upgrade	0	0	0
PSE Colstrip 1&2	0	0	0
Total	727	297	297

MRDAP Updates

- BPA and NWE have come to an agreement regarding the marketing of disputed 184 MW of ATC between the two entities
- Parties to the Montana Intertie Agreement (MIA) have agreed, and previously publicly announced, that the Colstrip-owning parties to the MIA can utilize their capacity rights on the intertie to move non-Colstrip station power under certain conditions
- Parties to the MIA have verbally agreed to a mechanism that may allow third party access to capacity on the intertie should it come available in future
- Parties to the MIA are in discussion regarding appropriateness of 5% loss rate for third party use; analysis and discussions are ongoing

Questions on Montana wind transmission access?



Other transmission- related comments and questions?



Distribution Resource Planning

Darren Murtaugh
T&D Planning



Discussion Topics For Today's Meeting

Overview of Distribution Resource Planning (DRP)

- *Overview of what DRP entails and what value DRP can provide*

Stages of Implementation

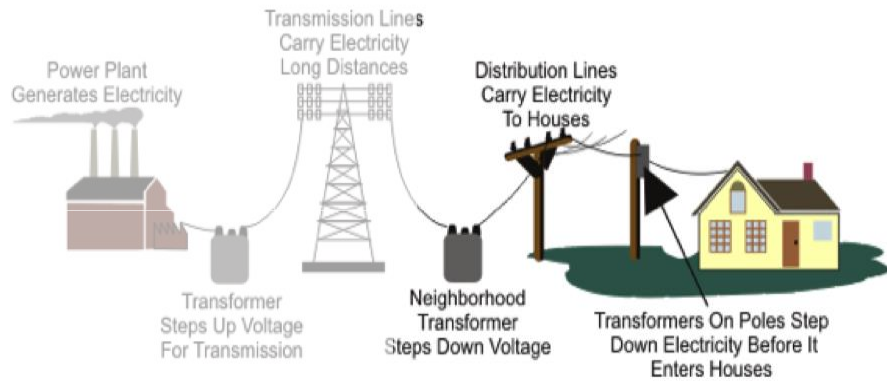
- *PGE's vision for what an implementation plan may look like*

Areas of Focus

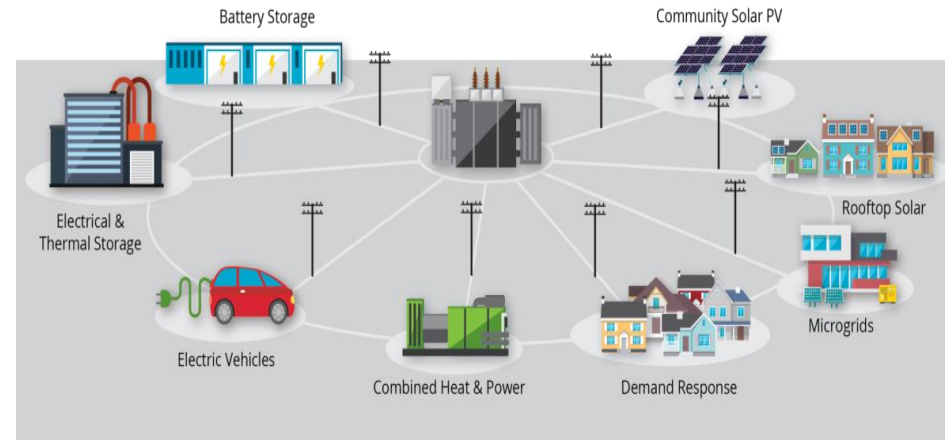
- *High level description of key outcomes for each stage of DRP*
 - *Data Integration & Forecasting*
 - *Distributed Energy Resource (DER) Operability & Functionality*
 - *Hosting Capacity Analysis*
 - *Locational Value Analysis*

What is Distribution Resource Planning?

Today: Distribution System Planning



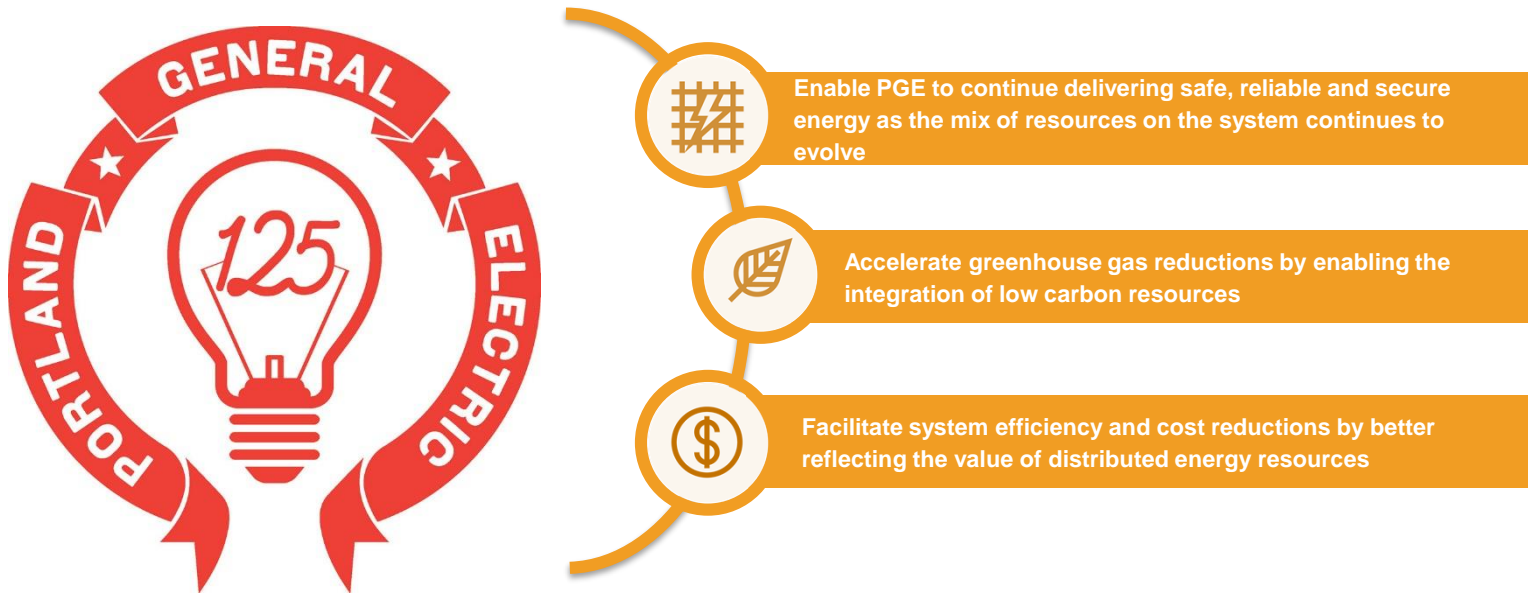
New: Distribution Resource Planning



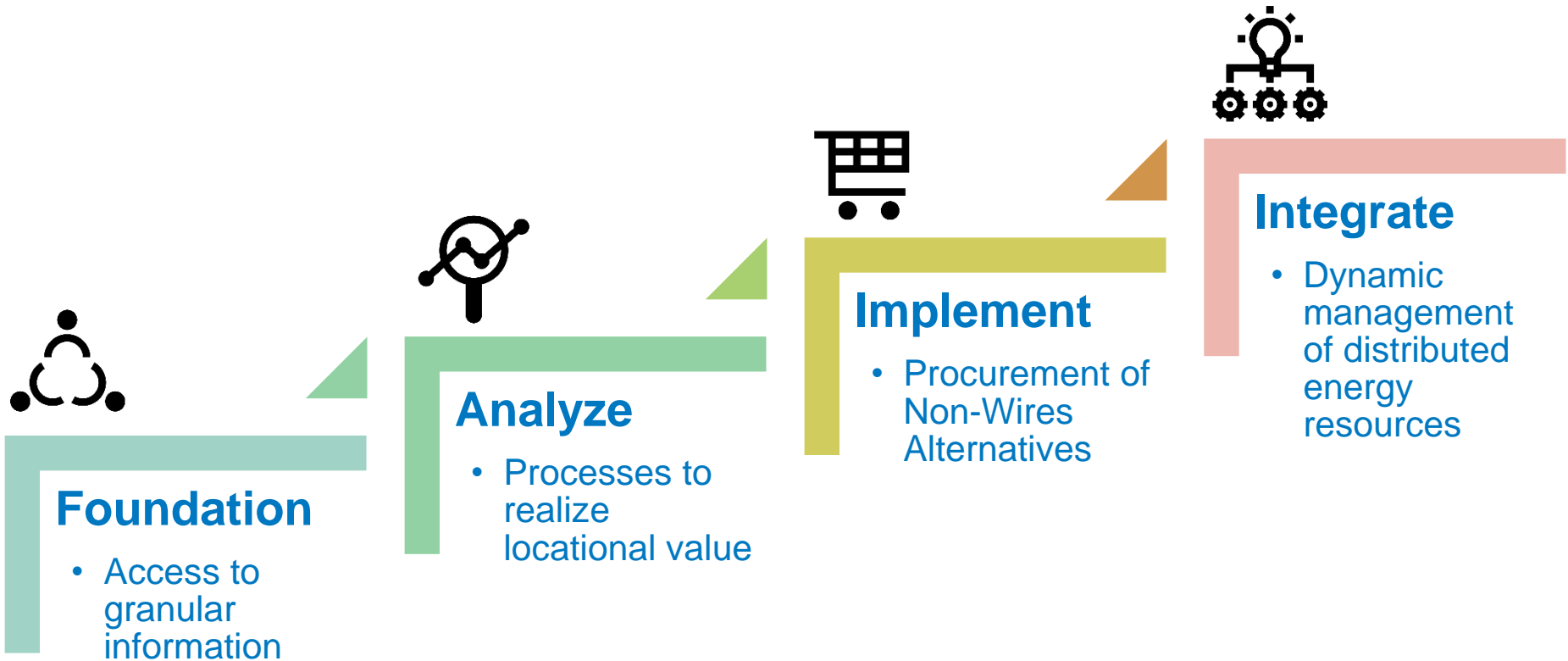
- Ensure we can meet the customer growth
- Capacity and reliability planning for peak loading conditions
- Meet core imperatives of safety, security, reliability, and affordability
- Integrate the presence and availability of Distributed Energy Resources (DER) into T&D Planning processes
- Continue to meet the core imperatives, and also modernize a more flexible grid that advances economy-wide decarbonization

Why Distribution Resource Planning?

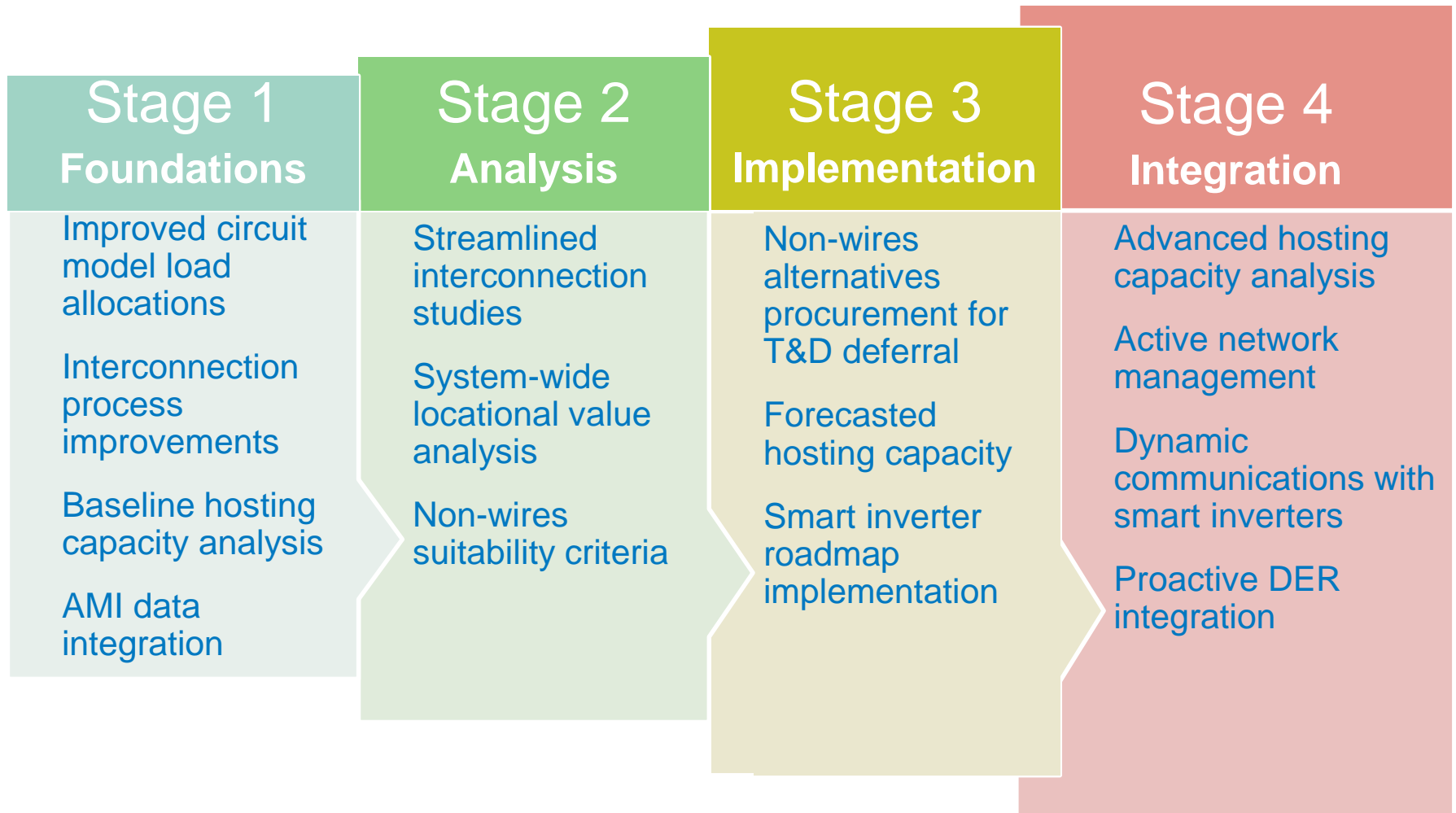
Purpose: Distribution Resource Planning (DRP) will form the foundations upon which PGE will plan the evolution of the modern flexible grid that cost-effectively accommodates electric system and economy-wide decarbonization efforts while maintaining or enhancing safety, reliability, and affordability.



Envisioned Stages of Implementation



Envisioned Stages of Implementation



Distribution Resource Planning

To effectively utilize Distributed Energy Resources for Grid support, PGE will advance their capabilities along the following primary areas of focus:

Data Integration & Forecasting

- Improve data quality, validate distribution models, integrate AMI nodal summaries
- Advance forecasting processes for DER and EV
- Feeder seasonal Load & Resource profiles
- Day-ahead and real-time distribution models

DER Operability & Functionality

- Streamlined System Impact Study Process
- Standards Implementation / Passive Smart Inverter Functions
- Enable Advanced Smart Inverter Functionality

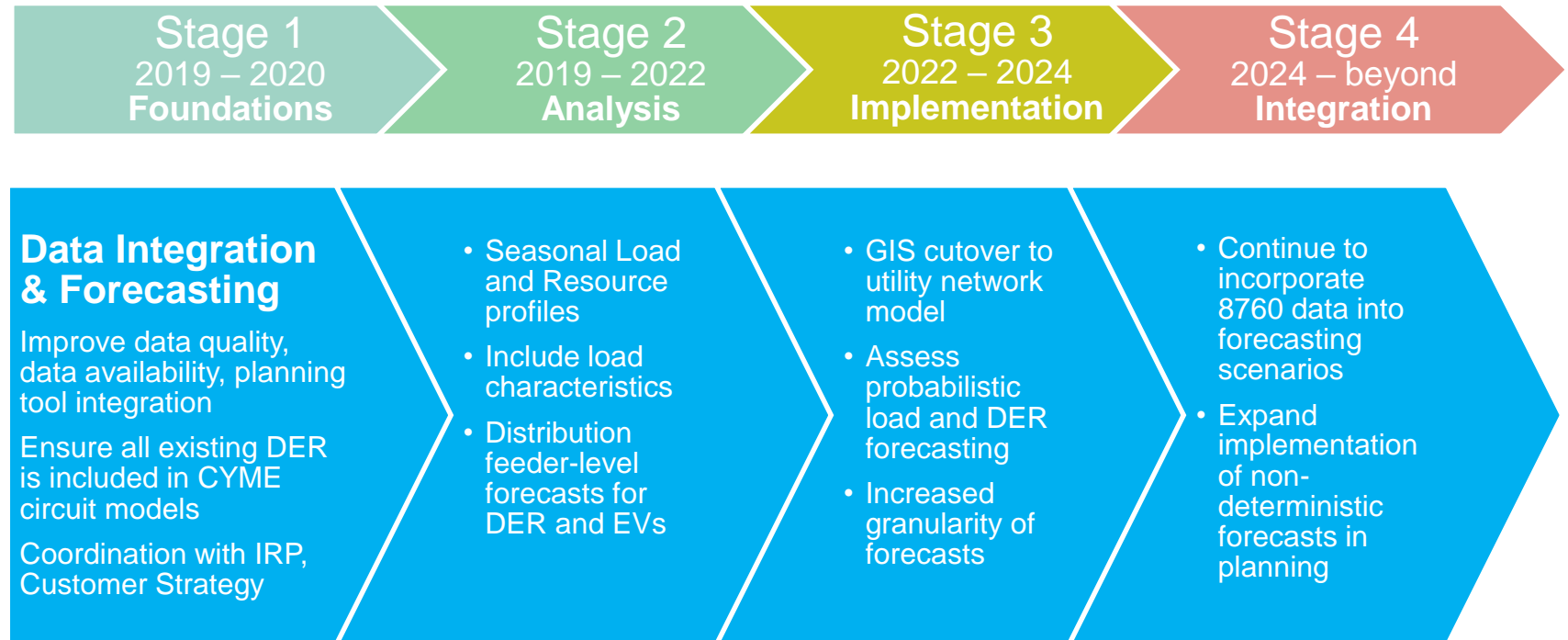
Hosting Capacity Analysis

- System-wide baseline Hosting Capacity assessment for PV solar
- Refine methodology to consider seasonal values & load profiles
- Quantify impact of smart inverter functionality on Hosting Capacity

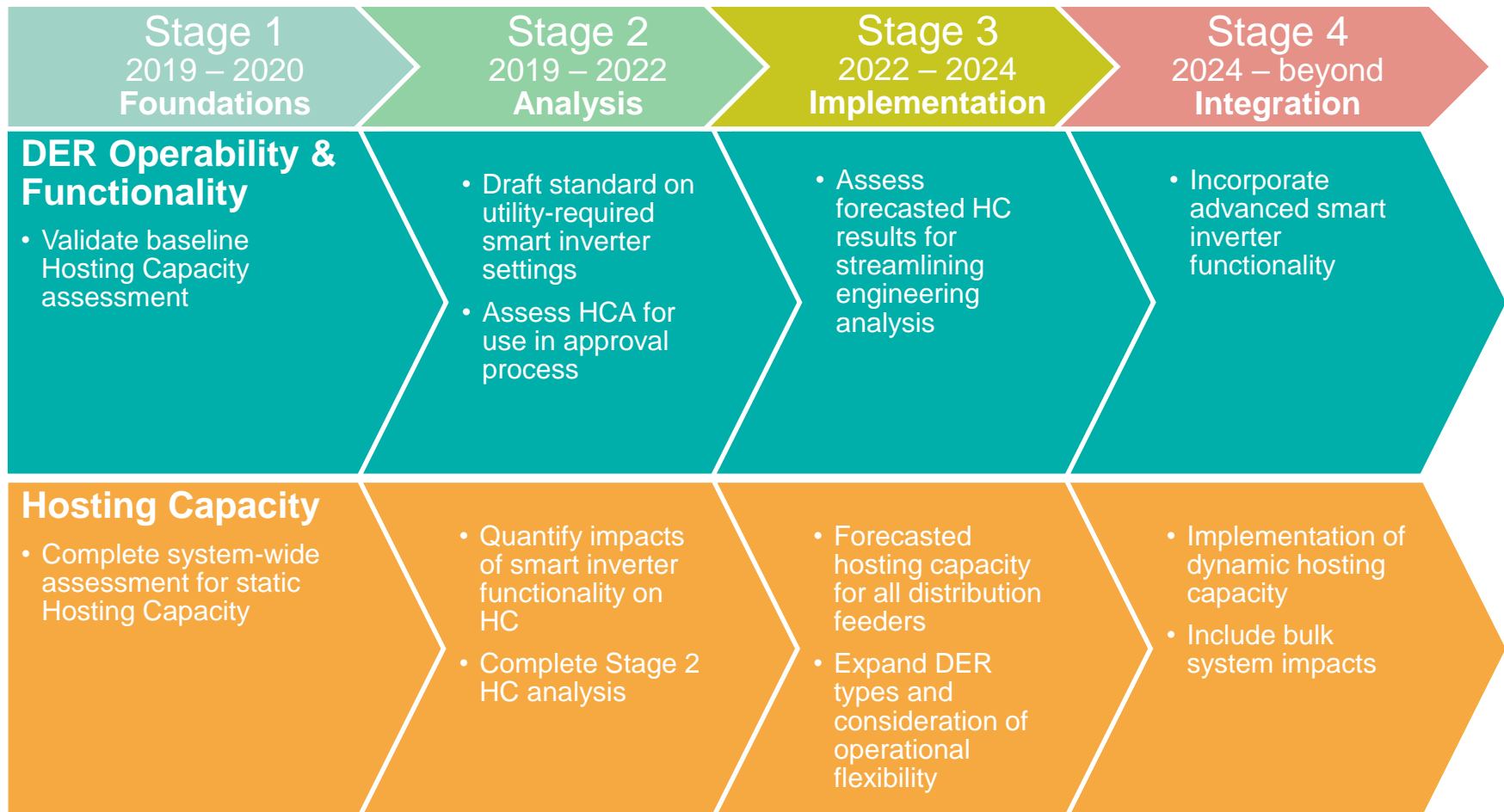
Locational Value Assessment

- Identify and Benchmark a uniform set of Value Streams
- Validate locational value and stacked benefits per learnings from PGE pilots
- Refine methods, tools, and processes for reporting locational value
- NWA suitability criteria and study process

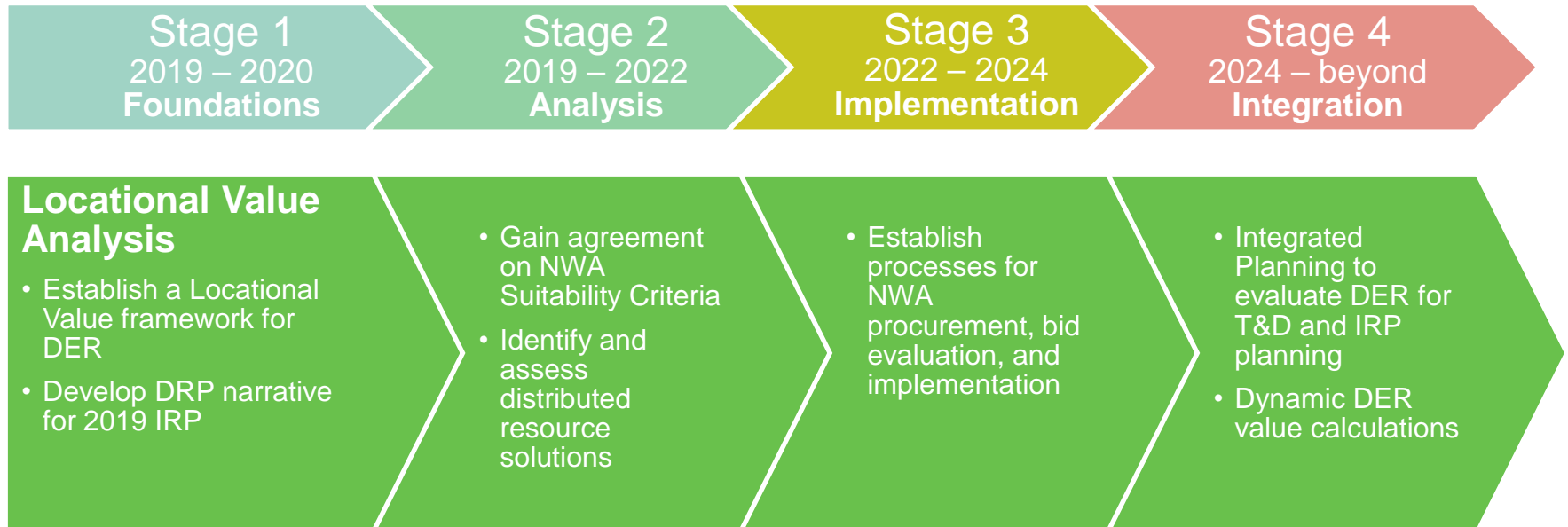
Data Integration and Forecasting



DER Operability/Functionality and Hosting Capacity



Locational Value Analysis



Questions?



Distribution Resource Planning Intro

Shauna Jensen
Integrated Resource Planning



Wrap up

Elaine Hart



Upcoming 2019 Roundtables

<p>Roundtable 19-1 Wednesday, February 27, 2019 (9:00 am - 1:00 pm PST)</p> <p>2 World Trade Center, Sky Bridge A&B 121 SW Salmon St., Portland, OR 97204</p>	<p>AGENDA</p> <ul style="list-style-type: none">▪ TBD
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<https://www.portlandgeneral.com/our-company/energy-strategy/resource-planning/integrated-resource-planning/irp-public-meetings>

Wrap Up

- Thank you for your participation today!
- **Questions or Feedback** - If you would like to provide feedback on PGE's 2019 IRP or the IRP process
 - Complete the IRP Online Form
(<https://www.portlandgeneral.com/forms/pge-stakeholder-feedback>)
 - Email IRP@pgn.com