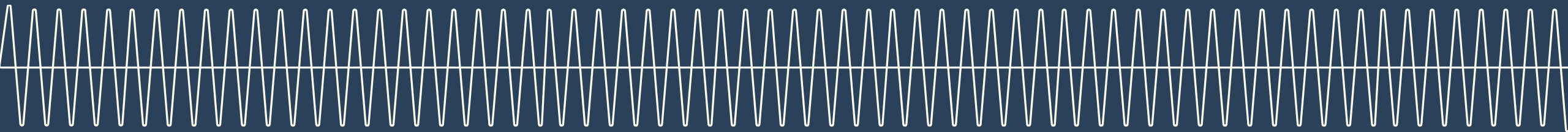
Distribution System Planning (DSP): Introductions and Roadmap

Angela Long, Manager, Distribution Resource Planning (DRP)

January 13, 2021 | Workshop 1



Meeting Logistics

- We are available at: DSP@pgn.com
- Teams Meeting
  - Please click the meeting link sent to your email or Click here to join the meeting
    - +1 971-277-2317 (dial this number into your phone for best results)
    - PW: 949 185 727#
  - Please use Microsoft Edge or Google Chrome with Teams as it will give you the best experience
  - During the presentation, all attendees will be muted; to unmute yourself via computer, click on the microphone that appears on the screen when you move your mouse
  - To unmute yourself over the phone, press *6
  - If you call in using your phone in addition to joining via the online link, please make sure to mute your computer audio
  - There is now a meeting chat feature rather than a Q&A feature. Pull this up on the menu bar when you move your mouse and look for the little message icon

Agenda

- Introductions
- PGE DSP Overview and Related Initiatives
- Distribution System Plan (DSP) - Overview
- Community Engagement
- Next steps

Introductions

PGE Introductions

Angela Long
Manager, Distributed Resource Planning

- **Andy Eiden**
  Sr. Strategy & Planning Analyst
- **Bachir Salpagarov**
  Strategy & Planning Analyst
- **Misty Gao**
  Strategy & Planning Analyst
- **Nihit Shah**
  Sr. Strategy & Planning Analyst
- **Tony Grentz**
  DRP Engineer

Diversity, Equity and Inclusion (DEI) Team

Jake Wise
Community Outreach Manager

- **Cristian Salgado**
  Sr. DEI Community Outreach Consultant
- **Jenn Latu**
  Sr. DEI Community Outreach Consultant
- **Tamara Falls**
  Sr. DEI Community Outreach Consultant

McKena Miyashiro
Principal Diversity Consultant

Derrick Harris
Manager, Distribution Planning

- **Aaron Banks**
  Assoc. Distribution Planning Engineer
- **Amrit Rajagopal**
  Assoc. Distribution Planning Engineer
- **Josh Davis**
  Distribution Planning Engineer
- **Justin Graff**
  Sr. Distribution Planning Engineer
- **Luke Depiesse**
  Staff Distribution Planning Engineer

Your PGE Teams – DSP: Part 1

Baseline Data & System Assessment

- Distributed Resources Planning
- Diversity, Equity, and Inclusion
- Distribution Planning
- Grid Products and Integration
- Interconnection

Hosting Capacity Analysis

- Distributed Resources Planning
- Distribution Planning
- GIS
- Interconnection
- Distribution Operations

Community Engagement Plan

- Distributed Resources Planning
- Distribution Planning
- Diversity, Equity, and Inclusion
- Grid Products and Integration

Long-term Plan

- Distributed Resources Planning
- IRP
- Distribution Planning
- Grid Products and Integration
- Diversity, Equity, and Inclusion
- Grid Modernization

Plan for Development of Part 2

- Distributed Resources Planning Team
- IRP
- Distribution Planning
- Diversity, Equity, and Inclusion

Partner Introductions

Name

Organization

What do you want to get out of this engagement?

Any perceived challenges we can help mitigate moving forward

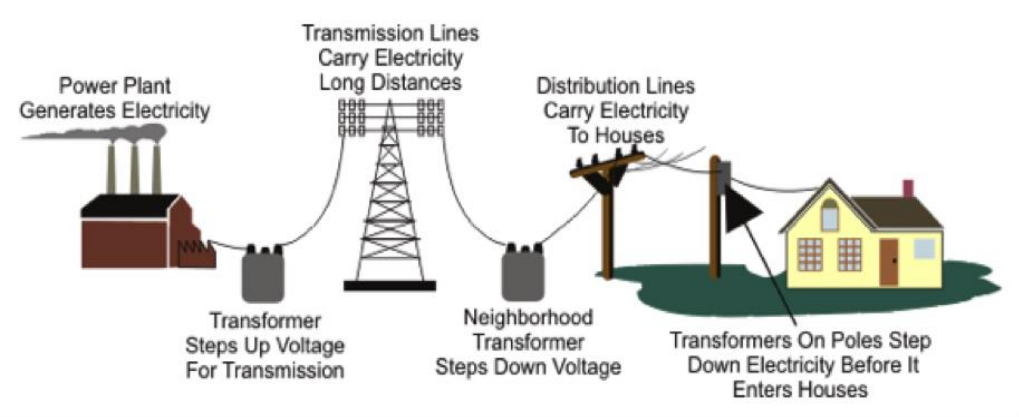
A fun fact about you or your organization

Feel free to introduce yourself via email at DSP@pgn.com

PGE DSP Overview and Related Initiatives

Evolution of Distribution System Planning

Historical power delivery paradigm



- Meet core imperatives of safety, security, reliability, and affordability
- Capacity and reliability planning for peak loading conditions
- Ensure we can provide infrastructure to meet customer growth

vs

A modern grid with modern demands

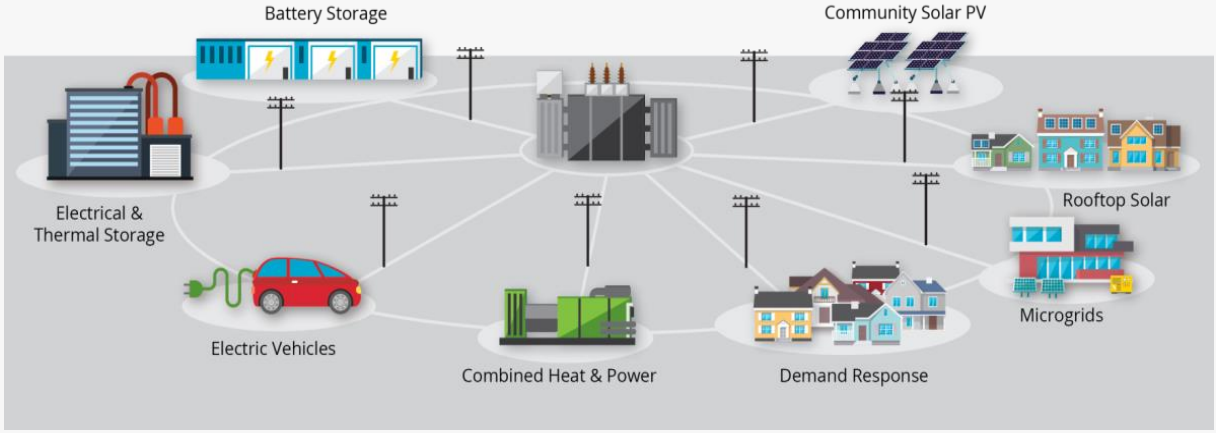


Image Source: OATI

- Integrate DER into Transmission and Distribution (T&D) Planning processes
- Optimize energy resources across the grid under a variety of loading conditions (e.g., 8760)
- Continue to meet the core imperatives while building a more flexible grid that advances economy-wide decarbonization efforts

Distribution System Highlights

Distribution automation (DA)

- Purpose to improve reliability
- Utilizes switching devices to automatically isolate faulted areas and restore power to the remaining areas
- Enhanced visibility – communicating reclosers provide additional monitoring on the distribution system
- Implement solutions to migrate to Field Area Network (FAN)

Volt-VAR optimization

- Voltage control devices (e.g., load tap changers to perform load drop compensation)
- Substation and field capacitor banks
- Voltage regulators

System monitoring

- 100% AMI meters
- Distribution substation monitoring (i.e., 82.5% SCADA enabled, 16.7% MV90, 0.8% Unattended)
- Communicating devices (e.g., fiber network, cellular services)

Grid Edge Technology Demonstrations

Transportation Electrification

- **Transit infrastructure:** PGE owns and operates on-route (450 kW) and depot (150 kW) transit bus charging infrastructure on behalf of TriMet. Serves 5 all-electric transit buses with more planned in the future
- **Public fast charging:** PGE owns and operates seven public fast charging locations, each with four DCQC charging ports (50 kW each) and two level 2 ports (7 kW each) for quick re-fueling
- **Medium- and Heavy-Duty Charging:** PGE and Daimler Trucks North America launched the first public, purpose-built heavy-duty truck charging demonstration site in the United States, designed to serve up to 5 MW of load and up to 12 DC fast charging ports accessible by Class 8 vehicles with 53’ trailers.

Energy Storage / Microgrids

- **Salem Smart Power Center** (5 MW / 1.25 MWh battery energy storage system in operation since 2010 as part of U.S. Dept of Energy grant award)
- **Resiliency:** PGE is developing five energy storage projects totaling 30 MW / 102 MWh, including two microgrids at critical facilities, across multiple end-use applications
- **Residential Smart Battery Pilot:** PGE is enrolling 525 residential customers into a Bring-Your-Own-Battery program that will compensate customers in exchange for PGE managing the charging and discharging of energy for a variety of uses

History of DER modeling in PGE's IRP

PGE has a history of modeling Demand Response (DR) for the IRP, beginning in 2004. More recently, PGE conducted the following Distributed Energy Resources (DER) studies:

2016 IRP: DR Potential

- Estimated the maximum achievable potential that represented approximate upper-bounds based on program characteristics and experiences of other utilities

2019 IRP: DER and Flex Load Study

- Introduced greater focus on accurately characterizing EV load and DR potential
- Incorporated additional DERs (e.g., solar and storage), plus added interactive effects inherent to the modeling (e.g., price interactions)

2022 IRP: DER and Flex Load Study **(Current study)**

- Assesses DER and Flex Load potential to inform PGE's 2022 IRP, as well as delivers a model for generating feeder-level forecasts
- Higher emphasis on reflecting PGE customer base and adoption potential (e.g., use of regional studies and granular datasets)
- Ability to conduct more internal scenario analysis for incorporation into ongoing DSP

Advanced Grid Modeling

Smart Grid Testbed

- Pilot locational value project to investigate new tools and methods to estimate DER contribution to locational net benefits
- Load disaggregation study to identify end use loads from AMI consumption signature

Non-wires alternative planning

- Undertaking integrated DER power flow studies for test cases where capacity constraints are expected
- Aiming to understand ability of DERs to contribute to traditional asset deferral and maintain utility safety and reliability planning metrics

PGE-Funded Research & Development

- PNNL Transportation Electrification R&D to model distribution system impacts of MDHDV* using GridLAB-D
- PSU Transportation Electrification R&D to develop better tools to run impact scenarios in CYME using Python scripts
- Working with EPRI to model probabilistic impacts on residential EV charging on service transformer assets

*MDHDV – Medium-duty and heavy-duty vehicles

Distribution System Plan (DSP)- Overview

Distribution System Plan (DSP) Details

Distribution System Plan

Part 1 details (due Oct 2021):

- Baseline Data and System Assessment
- Hosting Capacity Analysis
- Community Engagement Plan
- Long-term Plan
- Plan for Development of Part 2

Part 2 details (due Aug 2022):

- Forecasting of Load Growth, DER Adoption, and EV Adoption
- Grid Needs Identification
- Solution Identification
- Near-term Action Plan

PGE's high-level approach

DSP Report

- Draft sections to be presented throughout the engagement process and before the larger review period
- Draft maps and visuals will be available to partners to provide early feedback

Pilots

- PGE aims to overlay the OPUC's approved UM2005 Guidelines and community engagement efforts into PGE's ongoing initiatives to determine the number and types of pilots that may best serve communities and customers

Partner Engagement

- PGE recommends regular meetings
- These meetings will build on each other

DSP Starting Point

Baseline Data and System Assessment	**Foster transparency and enable effective decision-making, providing a fundamental understanding** of the current physical status of the utility distribution systems, recent investment in those systems, and the level of distributed energy resources (DERs) currently integrated into those systems.
Hosting Capacity Analysis	**Conduct system evaluations** to identify generation constrained areas where it is difficult to interconnect DERs without system upgrades and present the results through a map on PGE's website. **Prepare analysis of options** including opportunities, barriers, cost and timelines for each of the three options.
Community Engagement Plan	**Involve partners in the preparation and implementation of DSP and provide opportunities for partners to contribute information and ideas, as well as to receive information.**
Long-term Plan	**Develop a long-term distribution system investment plan and inform broader goals related to maximizing reliability, customer benefits, and efficient operation of the distribution system.**
Plan for Development of Part 2	Discussions regarding a) How legacy distribution planning practices will be **transitioned to the requirements of Part 2**, b) Whether all **legacy distribution planning practices will be transitioned in time for filing Part 2**, and **if not, the expected timeframe for that eventual transition**, c) **Efforts to synchronize IRP activities** with requirements of Part 2.

Other major requirements and recommendations

Partner Engagement	• A minimum of four workshops • A minimum of two workshops per Part
Pilots	• Hosting community meetings during pilot project development • Two non-wire alternate pilots • Rural and hosting capacity analysis pilots are recommended
Data usability	• DSP will include maps and feeder level granularity for baseline data
Additional topics	• Topics including cybersecurity, community outreach, regulatory development, and data transparency will be discussed as part of the ongoing UM2005 docket

Poll of proposed topic categories

Utility Baseline Data & System Assessment

- PGE presents an overview of existing baseline data for distribution planning, interconnection, and DERs.
- PGE provides visuals/datasets of PGE's baseline data for distribution planning, interconnection and DERs.

Community Engagement Plan

- PGE, in partnership with communities and customers, co-develop a long-term community engagement strategy and plan.

Hosting Capacity Analysis

- PGE provides a high-level overview of current hosting capacity capabilities. PGE will also share PGE's Net-Metering Map.
- PGE's to discuss a plan for conducting a hosting capacity short and long-term roadmap.

Near-term & Long-term Plan

- PGE provides a high–level overview of PGE's current near term and long-term plan. PGE, in partnership with communities and customers, co-develop identify new opportunities, and strategies.

Non-wires Alternative (NWA)

- PGE to share current efforts on NWA criteria and co-develop a criteria for future projects.
- PGE's to share proposed NWA projects based on co-developed criteria.

Grid Needs & Solutions Identification

- PGE will provide a high-level overview of how the electric utility works. PGE will also provide an overview of PGE's DER and Flex Load Potential Study.
- PGE to share results from the IRP on DER targets.

Others Proposed Topics Roundtable

Example Meeting Agenda: Non-wires Alternative (NWA)

- PGE current process
- Which projects are a priority?
  - Community interest in ***clean energy planning and projects***
  - ***Community energy needs and preferences***
  - ***Community barriers*** to clean energy needs, preferences, and opportunities
  - ***Energy burden*** within the community
  - Community ***demographics***
  - Any ***carbon reductions*** resulting from implementing a non-wires solution rather than providing electricity from the grid's incumbent generation mix
- Co-develop a recommended path forward

Community Engagement

Engaging Our Communities

- Our objective is to foster **procedural equity and ensure diversity of voice** in the DSP planning process by intentionally engaging Community-based Organizations (**CBOs) or other organizations representing environmental justice communities** who may not be represented in this workshop today
- We seek to build on Community Engagement (CE) best practice, as provided by partners in the UM2005, and in conversation, to define the **scope, structure and cadence of CE Workshops** (e.g., Verde, CEP, ETO, NWEC)
- We ask that those who are interested in contributing to this work with community reach out and express their interest via DSP@pgn.com ahead of a more **inclusive community "pathways" workshop in the weeks to come.**

Next steps

Next Steps

Next meeting's proposed topic:

- Email us at DSP@pgn.com if you want to see specific topics

DSP Development Timeline

- Part 1 – Due to the commission on October 15, 2021
- Part 2 – Due to the commission on August 15, 2022

You can reach us at:

DSP@PGN.com

Let's meet the future together.

Additional Resources

2019 IRP AND DER AND FLEX LOAD STUDY, AVAILABLE AT: *HTTPS://PORTLANDGENERAL.COM/ABOUT/INTEGRATED-RESOURCE-PLANNING*

2019 SMART GRID REPORT, AVAILABLE AT *HTTPS://EDOCS.PUC.STATE.OR.US/EFDOCS/HAQ/UM1657HAQ15635.PDF*

2019 TRANSPORTATION ELECTRIFICATION PLAN, AVAILABLE AT: *HTTPS://EDOCS.PUC.STATE.OR.US/EFDOCS/HAA/HAA165721.PDF*

PGE 2020 ANNUAL ENERGY STORAGE UPDATE, AVAILABLE AT: *HTTPS://EDOCS.PUC.STATE.OR.US/EFDOCS/HAD/UM1856HAD151753.PDF*

PGE 2020 FLEXIBLE LOAD PLAN, AVAILABLE AT HTTPS://EDOCS.PUC.STATE.OR.US/EFDOCS/HAA/HAA125814.PDF