ITEM NO. 1

PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT
PUBLIC MEETING DATE: March 21, 2019

REGULAR X **CONSENT** ____ **EFFECTIVE DATE** **Upon Approval**

DATE: March 13, 2019

TO: Public Utility Commission

FROM: Caroline Moore CM

THROUGH: Jason Eisdorfer and JP Batmale

SUBJECT: OREGON PUBLIC UTILITY COMMISSION STAFF:
(Docket No. UM 2005) Request to open an investigation into distribution system planning.

STAFF RECOMMENDATION:

Staff recommends that the Oregon Public Utility Commission (OPUC or Commission) open an investigation into distribution system planning (DSP). The investigation would develop a transparent, robust, holistic regulatory planning process for electric utility distribution system operations and investments.

DISCUSSION:

Issue

Whether the Commission should open an investigation into electric distribution system planning.

Applicable Law

Under ORS 756.515(1), whenever the Commission believes that an investigation of any matter relating to any public utility or telecommunications utility or other person should be made, the Commission may, on its own motion, investigate any such matter.

Analysis

Background

For decades, Oregon utilities have engaged in a robust bulk system planning process known as Integrated Resource Planning (IRP).[1] With the introduction of Smart Grid Report requirements in 2012, the Commission began to broaden the existing planning paradigm to include a more thoughtful consideration of grid modernization measures and increased attention to the distribution system. Through IRP Order Nos. 17-386 and 18-138, the Commission furthered this evolution of the utility planning framework by directing Portland General Electric and Pacific Power to work with Staff and parties to define a proposal for opening an investigation into distribution system planning.[2]

On February 19, 2019, Staff released its whitepaper, "A Proposal for Electric Distribution System Planning." In this paper Staff outlined the rationale for opening an investigation into distribution system planning. (See Attachment A.) Staff's whitepaper included the key drivers for investigating DSP, the desired outcomes of both the investigation and the future planning process, a near-term scope and schedule for the investigation, and a comprehensive list of additional planning considerations.

Staff held a stakeholder workshop to review the whitepaper and receive feedback on the proposed investigation prior to requesting that the Commission open the investigation. Staff appreciates the questions and insights provided by participants. More than 40 attendees participated in the March 1, 2019 workshop, including representatives from:

- Alliance of Western Energy Consumers
- Economist.com
- Energy Trust of Oregon
- ICF
- Idaho Power Company
- Northwest Energy Coalition
- Northwest Natural
- Oregon Citizens Utility Board
- Oregon Department of Energy
- Oregon Solar Energy Industry Association
- PacifiCorp
- Portland General Electric
- Renewable Energy Coalition
- Renewable Northwest
- TriMet

[1] Staff uses the term bulk system to generally refer to the infrastructure used to balance utilities' system-wide resources and loads, including centralized generation resources and the transmission system that delivers the output from those resources to the utilities' local distribution networks. Staff expects more precise definitions of bulk and distribution systems to emerge through the DSP investigation.

[2] *In re Portland General Electric*, OPUC Docket No. LC 66, Order No. 17-386 at 19 (Oct. 9, 2017); *In re PacifiCorp*, OPUC Docket No. LC 67, Order No. 18-138 at 22 (Apr. 27, 2018).

Participants asked questions about Staff's proposed investigation and identified important considerations for further exploration in the investigation, including:

- What is the purpose of the distribution system plan and who is the audience?
- If the desired outcome of DSP is maximizing customer value through distribution-level investments and operations, how will customer value be defined?
- What is the outcome of the plan, in terms of acknowledgement, approval acceptance, or other processes? And, what precisely will be acknowledged, approved, or accepted?
- What are the appropriate components of the distribution system plans, including the timescale and level of detail?
- What information, analyses, and data do stakeholders need to see? What information may not provide value to Oregon stakeholders or require more resources to produce than the value it brings to the DSP process?
- How will DSP be linked to other regulatory processes, such as IRPs and Smart Grid Reports?

Participants also engaged in a small-group, brainstorm exercise to develop topics for education-focused workshops. A summary of ideas shared during the group exercise is provided in Attachment B.

Based on the workshop discussion, Staff plans to move forward with the investigation proposed in the Staff whitepaper with a single modification described below. The high level of engagement and meaningful insights notwithstanding, the workshop reinforced that tackling the breadth of technical, financial, policy, and planning issues within the scope of DSP may be challenging. Staff finds that the best course of action is to begin the process without further delay—understanding that there is much to learn and parties should remain adaptive and open to iteration throughout the investigation.

Proposed Investigation Structure and Timeline

Staff proposes an investigation structure that is phased, adaptive, and involves considerable stakeholder engagement. The proposed structure is summarized in the following table, which is based on Figure 6 of Staff's whitepaper. The investigation structure contains a modification to the Phase 3 key objective, which highlights the need for further discussion about the appropriate Commission action after the initial distribution system plans are accepted.

	Pre-Launch	Phase 1: Baselining	Phase 2: Assessment	Phase 3: Refinement
Time-frame	February - March 2019	March 2019 – December 2019	January 2020 – May 2021	June 2021 - ongoing
Goal	Identify the focus of and process for a DSP investigation	• Begin developing a knowledge-base for the major DSP principles • Develop guidelines to evolve the smart-grid report into a robust (initial) distribution system plan	Review the current state of each utility's system, identify near- and long-term needs and next steps to get to optimization	Refine planning process, incorporate additional considerations and requirements
Process	• Staff whitepaper released: Outlines Staff proposal for DSP investigation. • Scoping workshop: Stakeholder feedback on Staff proposal i.e., establish whether OPUC has outlined the correct drivers, outcomes, phases, goals and deliverables. • Public meeting memo: Staff's final proposal requesting investigation.	• Workshops: Staff will conduct a series of workshops to establish a baseline understanding of distribution system planning fundamentals, current utility processes, and outstanding distribution planning needs. • Draft guidance: Staff releases draft proposal for DSP guidance. • Stakeholder comments/ workshop(s) as necessary • Revised draft guidance • Final comments • Public meeting memo: Staff final proposal for DSP guidance.	• Establish individual utility dockets • Utilities file based on Commission guidance (~ 8 months) • OPUC and stakeholder engagement process (~ 6 months) ▪ Comments ▪ Workshops • Public meeting memo: Staff final recommendations (~April 2021)	• Continue to implement planning process as directed by Commission • Improve and evolve content, process, tools, and methodologies • Continue to incorporate evolving policy and operational requirements
Key Objective	Commission order opening investigation	Commission order adopting guidance for utilities to file initial DSPs	Commission orders accepting utilities' initial DSPs and direction to refine DSP process and/or DSP guidance	Commission approval of subsequent utility DSPs as determined during Phase 1 and guidance for refinement of subsequent utility DSPs

Following a Commission decision to open the investigation, Staff will develop, share, and begin executing a Phase 1 workshop plan. As the investigation progresses, phases, goals, milestones, and objectives will be shaped by shared learnings and continued stakeholder input. Staff will continue to work to engage a broad stakeholder group throughout the investigation.

Conclusion

After consulting stakeholders, Staff finds that it is necessary to begin taking steps to establish a transparent, robust, and holistic regulatory process for distribution system planning. Staff proposes to launch a phased investigation into DSP that results in maximized customer value through optimized distribution system operations and investments.

PROPOSED COMMISSION MOTION:

Staff recommends that the Commission open an investigation into distribution system planning.

Staff Whitepaper: A Proposal for Electric Distribution System Planning

Oregon Public Utility Commission

Introduction

Expectations for Oregon's electrical grids are changing. Technological advancements in grid infrastructure and distributed energy resources, combined with declining costs, evolving policies, and changing consumer interests are driving greater consideration for investments on the distribution system. These distribution-level investments create opportunities for Oregon's investor-owned utilities to optimize system operations and maximize value for customers. Currently, the Oregon Public Utility Commission (OPUC or Commission) and stakeholders lack the visibility and planning structure to ensure utilities are best positioned to capture these benefits.

The purpose of this white paper is to outline OPUC Staff's (Staff) proposal to develop a holistic, robust planning structure through an investigation into distribution system planning (DSP). Staff's proposal includes:

1) Proposed drivers, outcomes, and considerations for the investigation; and
2) A draft scope for the investigation.

Staff's proposal is intended to serve as the starting point of an inclusive public process. In its proposal, Staff outlines some of the central drivers and outcomes identified for the investigation. However, Staff recognizes that there is a wide range of significant, interconnected DSP elements for which the appropriate place in the investigation framework will become clearer through continued discussion with utilities and stakeholders. Staff's proposal outlines a number of these considerations, in addition to the stated drivers and outcomes.

Following the release of this whitepaper, Staff will hold a workshop with utilities and other interested parties to receive feedback on the proposed drivers, outcomes, considerations, and scope. Staff will incorporate this feedback into a request to the Commission to open a new investigation into DSP. Working with stakeholders, Staff expects to continue to explore and refine the elements of the investigation presented in this whitepaper.

Key Terms

For the purposes of this whitepaper, Staff adopts the following definitions from the U.S. Department of Energy (USDOE), but recognizes that additional refinement will occur in the proposed investigation.

> ***Distribution system:*** *The portion of the electric system that is composed of medium voltage (69 kV to 4 kV) sub-transmission lines, substations, feeders, and related equipment that transport the electricity commodity to and from customer homes and businesses and that link customers to the high-voltage transmission system.*
>
> ***Distributed Energy Resource:*** *Distributed generation resources, distributed energy storage, demand response, energy efficiency, and electric vehicles that are connected to the electric distribution power grid.*

Source: See page 7 of Modern Distribution Grid: Volume I https://gridarchitecture.pnnl.gov/media/Modern-Distribution-Grid_Volume-I_v1_1.pdf.

Background

Smart-Grid Reports: A foundation for modern distribution-level investments

In 2012, the Commission identified a need for utilities to consider and invest in smart-grid technologies, and to report on these activities through an annual Smart-Grid Report.[1] The Commission concluded that adopting a reporting requirement, rather than a planning requirement, was appropriate since the technologies were in different stages of development and affordability.

Since 2013, Oregon's investor-owned electric utilities, Idaho Power Company (IPC), PacifiCorp (PAC), and Portland General Electric (PGE) have filed annual or biennial Smart-Grid Reports. Reports are required to include utility strategy, goals, and objectives for smart grid investments, as well as the status of and plans for investments over the next five years within the Commission guidelines.

Staff greatly appreciates the thought and effort demonstrated by the utilities in developing the Smart Grid Reports, which provide important insight into a wide range of innovative grid modernization projects. However, Staff will illustrate the need to further expand and evolve this reporting framework in subsequent sections of the whitepaper.

Commission Guidance: Expanding utility transparency and regulatory process

In 2016 and 2017 respectively, Staff identified the need for additional planning processes specific to distribution-level investment in its comments on PGE's and PAC's Integrated Resource Plans (IRPs).[2] The following excerpt from Staff's initial comments in PGE's LC 66 2016 IRP captures Staff's motivation for initiating a DSP process:

"The description of PGE's thorough DSP's activities in the IRP update is helpful, but is not focused on getting to Staff's main issue of the need for improved transparency and creation of an overall plan for distribution system investments. PGE's four priority elements may be the best four areas for focus from a ratepayer perspective but the reasoning behind these selections and the ultimate goal these activities are intended to achieve was not provided, so Staff and stakeholders are unable to provide review of PGE's roadmap and plan."

Recognizing the need for a more robust distribution-level planning framework, the Commission directed both electric utilities to work with Staff and parties to define a proposal for opening a DSP investigation as a condition of IRP acknowledgement.[3]

[1] See Commission Order No.12-158 for Commission guidelines, policy goals, objectives, and reporting requirements related to smart-grid activities. https://apps.puc.state.or.us/orders/2012ords/12-158.pdf.
[2] See Dockets LC 66 and LC 67.
[3] See Order No. 17-386, p. 19 (PGE) and Order No. 18-138, p. 22 (PAC).

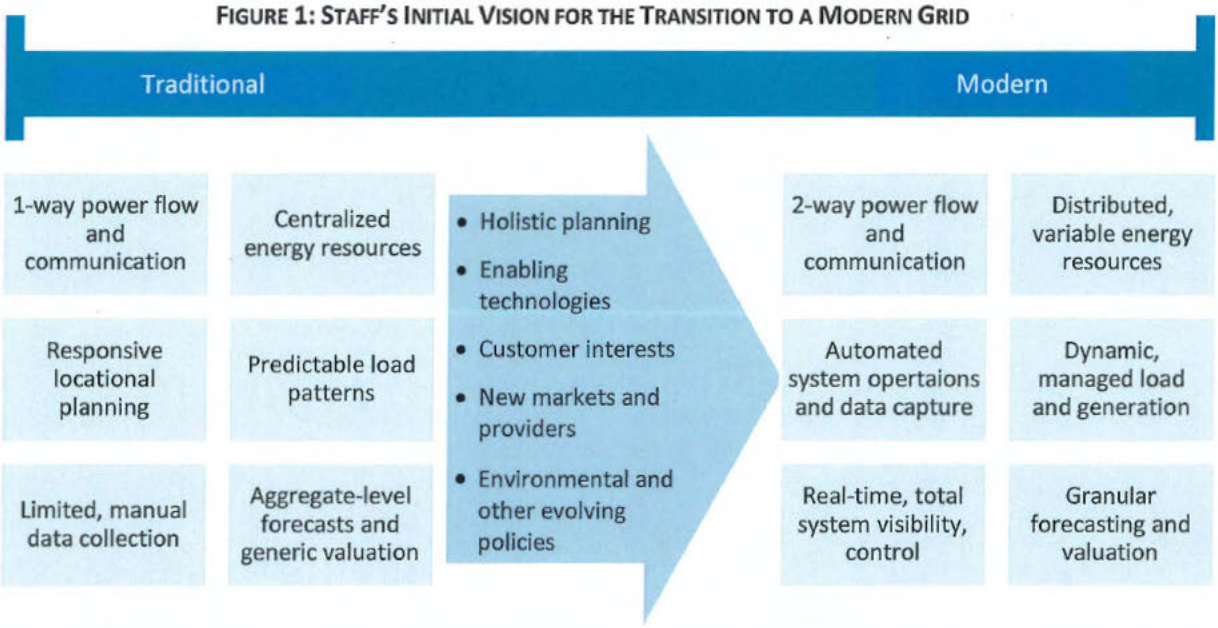
Governor's Climate Agenda: Prioritizing a modern, affordable grid

On November 28, 2018, Governor Kate Brown released the Oregon Climate Agenda, an eight-point strategy to achieve the state's climate goals over the next five years.[4] Key among these priorities, and likely to impact the electric grid and distribution system planning, are:

- Decarbonizing the electric sector by "encouraging grid modernization while maintaining affordable and competitive electricity rates";
- "[E]xpanding electric vehicle infrastructure and incentives to support 50,000 electric vehicles on Oregon roads by 2020";
- "[E]xpand[ing] the reach of energy efficiency programs"; and
- Expanding opportunities for customers to, "access clean energy services from their utilities while ensuring utility regulation supports the utility system and does not preference new customers over existing ones."

Staff envisions DSP as a critical step in moving the state's expectations for a modern gird forward. While a more precise long-term vision for the modern grid will develop through the implementation of DSP, Staff foresees an eventual transition to a more responsive platform that is capable of minimizing the frequency and impact of outages (e.g., automated outage restoration), supporting decarbonization (e.g., better integrating renewables), optimizing system performance (e.g., volt-var management), and enabling customers to deploy DERs in a manner that minimizes their costs while maximizing system benefits (e.g., more accessible hosting capacity data, advanced price signals.)[5]

FIGURE 1: STAFF'S INITIAL VISION FOR THE TRANSITION TO A MODERN GRID



Note: The DSP investigation will provide a clearer understanding of where each utility falls within this continuum.

[4] State of Oregon Office of the Governor. *Oregon Climate Agenda: A Strong, Innovative, Inclusive Economy While Achieving State Climate Emissions Goals. 2018.* https://www.oregon.gov/gov/policy/Documents/Governor Kate Brown Climate Agenda.pdf.

[5] Staff is referring to responsive pricing that signals conditions such as time, season, location/proximity to load, and other system conditions.

This whitepaper serves as an initial step in fulfilling the Commission's direction to open an investigation into DSP. The remainder of this report will outline Staff's initial proposal for initiating the DSP investigation, including the drivers, outcomes, considerations, and scope.

Proposed Investigation

FIGURE 2: STAFF'S PROPOSED FRAMEWORK FOR A DSP INVESTIGATION

States across the nation are engaging in a regulatory investigation into distribution system planning. Each DSP effort is shaped by that state's unique motivations and conditions.[6] Therefore, clearly defining Oregon's "drivers" for an investigation into DSP is the foundation of Staff's proposal. Once the drivers are established, expected outcomes to address the drivers can be identified, and a roadmap to achieve those outcomes can be constructed, i.e., the investigation scope.

The following sections will review the components of Staff's DSP investigation. Staff will also list the many additional elements for which the appropriate place in this framework will become clearer as OPUC works with utilities and stakeholders throughout this investigation. Staff will refer to these elements as considerations.

Drivers

Staff finds that the utilities are providing safe, reliable, affordable service and no known system crises are driving the need to create new DSP processes (e.g., current DER adoption levels are not immediately threatening reliability). Creating a framework to help parties understand and engage in DSP now will allow OPUC, the utilities, and stakeholders the opportunity to anticipate the impacts of the evolving distribution landscape and determine the best mechanisms to address those impacts moving forward. Within this context, Staff has identified two *proactive* drivers for initiating Oregon's DSP investigation.

1. Insight (procedural driver): The near-term need to establish visibility and holistic engagement in utilities' distribution-level investments.[7]
2. Optimization (operational driver): The longer-term need to ensure the operation of the changing distribution system maximizes efficiency and customer value.

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[6] The Pacific Northwest National Laboratory and Lawrence Berkeley National Laboratory's report, *Distribution System Planning – State Examples by Topic*, published in 2018, provides a useful overview of other state's' drivers, outcomes, and scope. https://epe.pnnl.gov/pdfs/DSP_State_Examples-PNNL-27366.pdf.

[7] Staff considers the need to establish more insight an opportunity for near-term action, but does not suggest that insight is only needed in the near-term. Staff proposes that insight is needed on an ongoing basis.

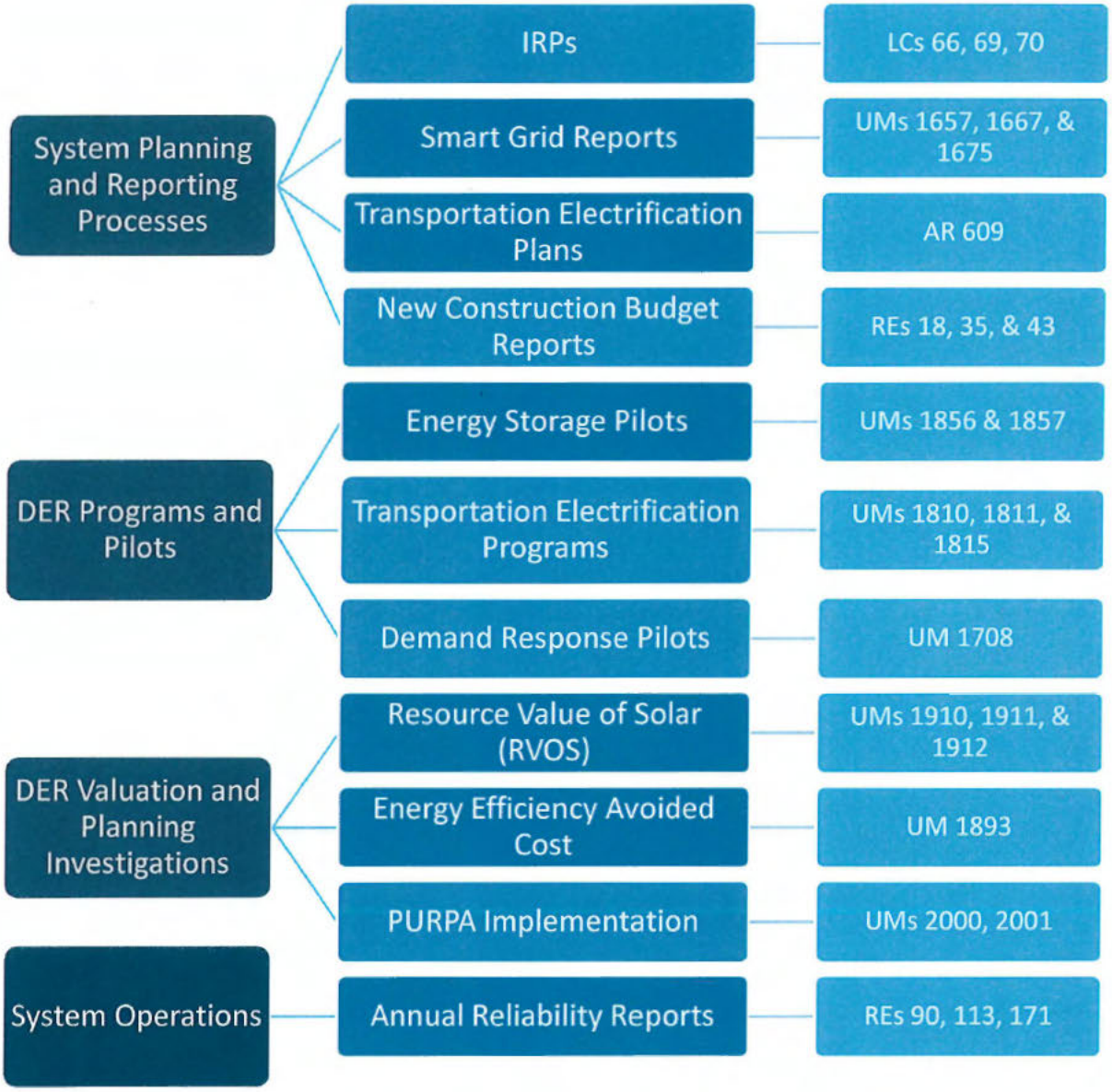
Insight

While OPUC and stakeholders are engaged with utilities to ensure the safety and reliability of the distribution system, there is less rigorous engagement in the utilities' distribution system planning processes and ongoing investment decisions. This is driven by several factors, including:

- **Limited visibility:** Unlike bulk system planning such as IRPs and transmission planning, the majority of utility distribution system planning and investment decisions occur through internal processes driven by short-term needs to maintain system reliability. OPUC and stakeholder visibility into these investments generally occurs at the aggregate level through rate cases or the utilities' New Construction Reports, which only report on individual investments over $10 million.[8]
- **Limited engagement:** OPUC and stakeholders also lack opportunities to participate actively in distribution planning processes and review proposed investments before they occur. When visibility is provided, it is primarily a one-directional flow of information, after the utility decision making process is complete (e.g. rate cases and Smart Grid Reports). A transparent utility planning process will provide OPUC and stakeholders with the opportunity to meaningfully engage with utilities' planning and decision-making processes, understanding the "how", "why", and priorities in addition to the "what".
- **Siloed actions:** Staff finds that there are a variety of disparate planning processes, reports, policies, programs, pilots, and other investigations related to distribution system operations (see Figure 3). OPUC and stakeholders are provided varying levels of insight through individual proceedings, but lack the regulatory connectivity to address distribution-level planning, investments, and operations holistically. A cohesive planning process will provide this whole system view, as well as, much needed procedural efficiency across participants in OPUC's regulatory processes. It will also provide OPUC with a richer understanding of the interaction of distribution-level issues with bulk system planning and ratemaking processes. Staff anticipates additional matters related to cyber security, data management, and third-party engagement in service delivery will further intensify this driver.
- **Nascence:** As demonstrated through Smart Grid Reports, utilities continue to expand their grid modernization learnings and identify opportunities to improve the grid to benefit customers. However, Staff and stakeholders are limited in their exposure to these learnings. Barriers to inclusive stakeholder engagement are heightened by the highly technical aspects of advanced technologies and distribution system operations. A robust planning process, and the associated utility transparency, will promote inclusivity and raise the knowledge-level across parties.

[8] OAR 860-027-0015 requires Oregon utilities with gross operating revenues of $50,000 or more per year to report information on new construction, extension, and new additions to property of the utility to the Commission annually. The report form only requires electric utilities to individually report the three highest cost projects and all projects greater than $10 million.

FIGURE 3: DISTRIBUTION-RELATED OPUC PROCEEDINGS



Optimization

The traditional distribution system was designed to support one-way flow of power from centralized production facilities, across the bulk transmission system and down to the distribution system for delivery to end users, without the breadth of modern communications, controls, and sensing technology available today. The planning and decision-making processes in place today were designed to ensure least-cost, least-risk operation of the traditional system. However, the evolution of technology, policies, markets, and consumer interests are challenging this long-standing paradigm. Staff finds that new processes and tools are required to ensure that 1) the optimal investments, programs, and policies are implemented; and 2) these investments, programs, and policies are implemented such that they maximize reliability, efficiency, and customer value as the landscape continues to evolve.

For example, traditional resource planning practices focus on identifying the aggregate load-resource balance and system-wide resource solutions to meet deficiencies. In the evolving landscape, consideration must be made with more awareness of granular balance of loads and resources and the full range of opportunities to meet the system's needs such as:

- What is the load forecast for a given area?
- What is the generating DER forecast in the area?
- What is the capacity of the distribution system to support the forecasted load-resource balance in that area?
- What other grid services are needed and/or anticipated in that area?
- What is the full range of technological, operational, and customer-driven options to meet those needs?
- How are the outcomes integrated with bulk-system planning and ratemaking processes?

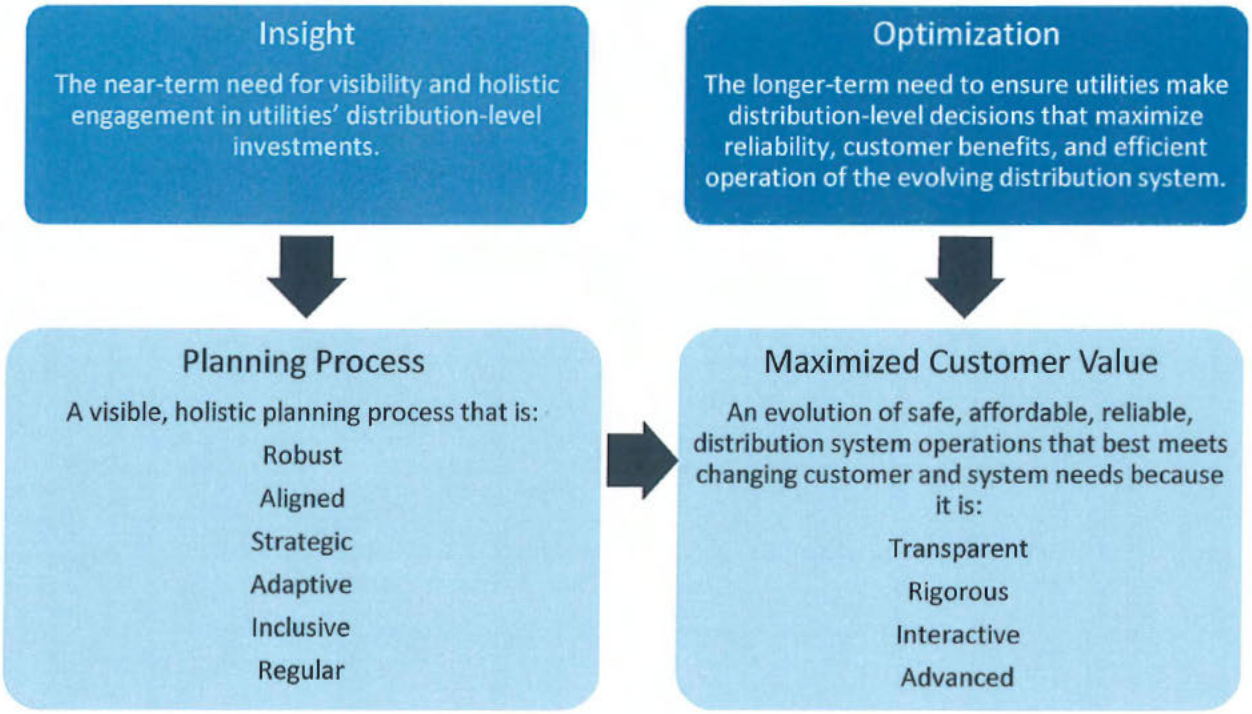
Staff finds that regulatory guidance for a utility DSP planning structure is necessary to support appropriate adoption of DER and grid technologies, and to ensure that utilities make distribution-level decisions that maximize reliability and customer benefits, and maintain efficient operation of the evolving distribution system.

Outcomes

Based on the need to establish insight and optimization, Staff envisions two key outcomes of the DSP investigation:

1. A planning process (procedural outcome): The direct outcome of the DSP investigation will be the creation of a new process that provides sufficient distribution system planning insight. Staff's vision for this process is described further in this section.
2. Maximized customer value (operational outcome): Staff aims to design a DSP process that ultimately results in investment and operational decisions that maximize value for utility customers. Staff's vision for a DSP process that achieves maximized customer value is described further in this section.

FIGURE 4: STAFF'S PROPOSED INVESTIGATION FRAMEWORK



Planning Process

Staff's immediate vision for the DSP investigation is relatively simple: Establish a regulatory planning process that provides adequate distribution system insight. Rather than drive DSP from the top down with prescriptive requirements for distribution-level investments and grid-modernization actions, Staff intends to build a planning structure through which the appropriate utility roadmap will emerge. At minimum, Staff proposes the planning process should be:

- **Robust:** Based on multi-scenario planning principles; considers the full range of technologies and resource types; recognizes the importance of future-proofing; attuned to the state's evolving policy goals e.g., decarbonization, reducing energy burden, resiliency, enhancing customer opportunities.
- **Aligned:** Streamlines the various distribution-related processes, policies, reports, and investigations (see Figure 3.); houses future distribution-related matters; integrates with IRPs such that all system adequacy and investment decisions are coordinated; aligns the procedural timeline and planning horizon with other processes, such as capital budget cycles and IRPs.
- **Strategic:** Provides a strategic roadmap of near and long-term investments that is prioritized and iterative; serves as a space to identify potential issues that will be addressed in separate filings; includes a long-term planning period and a short-term action plan.[9]

[9] Staff understands that the scale and nature of distribution system investments may require shorter planning horizons, action plans, and interim updates.

- **Adaptive:** Recognizes differences across utilities; balances well-defined Commission guidance with the flexibility for utilities to take ownership of the planning process and to adapt to a continually evolving landscape.
- **Inclusive:** Incorporates meaningful OPUC and stakeholder engagement; continues to focus on accessibility across customers and communities; serves as a public resource that is regularly referred to by Staff, stakeholders, and the Commission when considering new investments and how current and proposed projects fit in with the utility's vision.
- **Regular:** Plans are filed with predictability either through a regular schedule or triggered by specifically defined events.

Maximized Customer Value

Staff's ultimate vision for DSP is to maximize customer value by ensuring that the utilities' approach to managing and operating the distribution system is evolving in a least-cost, least-risk manner. While clearer policy objectives are expected to arise through the planning process, Staff's high level expectation is to develop a regulatory DSP structure that enables utilities to better identify system needs and evaluate the evolving range of opportunities that can meet those needs. The intended outcome is an approach to utility distribution system operations that evolves safe, affordable, and reliable, to also include:

- **Transparent:** Provides widespread system visibility; creates a roadmap for optimized locational planning e.g., hosting capacity analysis.
- **Rigorous:** Utilizes advanced methodologies to evaluate and deploy new grid capabilities, DER, and other non-wires alternatives to meet system needs e.g., refined avoided cost methodologies and use cases, multi-scenario analysis, more granular, responsive forecasts and valuation, data analytics enabled by grid modernization.
- **Interactive:** Enables the efficient integration of customer options; responsive to customer interest, environmental and other policy drivers e.g., sends advanced price signals to customers and other DER operators; streamlines interconnection; enables more two-way data and power flows.
- **Advanced:** Deploys modern software, hardware, DER technologies, and capabilities that maximize net customer and system benefits; deploys advanced communications, controls, platforms, and other technologies, based on a thoughtful grid architecture foundation i.e., Staff does not envision grid modernization for the sake of modernization, but expects that DSP will provide a clear pathway for utilities to take advantage of advanced technologies that demonstrate a net increase in operational efficiency and customer value.[10]

[10] For a more detailed understanding of the evolving range of opportunities to meet modern distribution system needs, Staff suggests reviewing the US Department of Energy's *Modern Distribution Grid Report*. https://gridarchitecture.pnnl.gov/modern-grid-distribution-project.aspx.

Considerations for DSP

In addition to the proposed drivers and outcomes, Staff presents the following list of considerations that represent a holding place for the breadth of important DSP elements for which an appropriate place in this framework will become clearer as OPUC works with utilities and stakeholders throughout this investigation:

- Grid modernization and aging infrastructure
- Increased DER penetration, exogenous and endogenous to the DSP process e.g., resulting from the DSP process, cost reductions, technological advancements, and other policy drivers such as Community Solar, Transportation Electrification, Energy Storage, Demand Response, and RVOS
- Evolving standards and the need for interoperability e.g., IEEE 1547
- The value of flexibility and the ability to respond to variability and uncertainty
- Resiliency, climate adaptation, and storm hardening
- Interfacing with the bulk system
- Integration with other planning processes, such as Smart Grid Reports and Transportation Electrification Plans
- Cybersecurity and safely harnessing data to support transparency and precision
- Customer choice and control
- The role and market for third-party providers
- Equity and the needs of underserved communities
- Accessibility of the distribution system for customers and third-parties based on system awareness, system constraints, and/or procedural challenges
- The role of R&D and pilots
- Staff's investigation into performance-base ratemaking and performance metrics

Proposed Scope

Staff recognizes that Oregon is not the first jurisdiction to engage in a DSP effort. In developing a proposed scope for the DSP investigation, Staff examined the breadth of procedural pathways created in other states to inform a plan that bridges the proposed drivers and outcomes for DSP.

Staff finds that a successful DSP investigation is iterative, adaptive to continued learnings, and involves considerable stakeholder engagement. To accomplish these ends, Staff proposes a phased approach that begins with a baseline assessment of the following:

- How do utilities currently plan for distribution system operations?
- What do the current plans look like?
- What does the current system look like?
- What are the known distribution system operations and planning needs?

Staff plans to open the first phase of the investigation with a series of educational workshops related to the questions above (see Figure 5.) The workshop process may begin with a policy-level discussion of stakeholder values, priorities, and desired outcomes; however, Staff expects that the majority of workshops will focus on technical discussions that create a shared understanding of utility distribution system operations, planning, and investments, along with emerging technology, markets, use cases, and valuation models.

FIGURE 5: POTENTIAL WORKSHOP CONTENT

Scoping

- Feedback on Staff proposed drivers and outcomes
- Feedback on Staff proposed investigation scope

Kick-off and DSP 101

- Overview of other state's regulatory efforts related to DSP
- Utilities review current DSP processes e.g., capital budgeting processes, project planning and selection processes, Smart Grid Reports and other grid modernization efforts, integration of DSP in IRPs, pilots and R&D
- Utilities review distribution system design principles e.g., how utilities plan and operate for reliability, resiliency, capacity, etc.
- Stakeholder values, priorities, and desired DSP outcomes

Principles of grid modernization – infrastructure and advanced technologies

- Overview of DSP concepts e.g., system data and visibility, controls, communications, technical standards/ requirements
- Utilities review current processes, projects, and etc.
- Stakeholder perspectives

Principles of grid modernization – forecasting, DER integration, and valuation

- Overview of DSP concepts
- Utilities review current processes, programs, and etc.
- Stakeholder perspectives

Final Perspectives

- Reviews Staff's draft proposal for DSP guidance
- Final utility and stakeholder perspectives

The initial phase of Staff's proposed investigation culminates with Commission guidance for utilities to file distribution system plans. In the interest of baselining and remaining adaptive, the Commission's initial guidance can be less formal than the IRP guidelines, providing a set of planning objectives and listing the data points and analyses that utilities are required to include in an initial DSP filing.[11] Further, Staff proposes that the initial DSP filing serve as a dry-run, which will receive significant Commission review, but not require Commission acknowledgement.

As the landscape continues to evolve and all parties develop expertise, subsequent phases will build on this baseline with continued expansion and refinement of Commission guidance for DSP.

Staff's proposed investigation scope is detailed in Figure 6 below.

[11] See Attachment B for an example of Minnesota PUC's Integrated Distribution Planning Requirements for Xcel. Staff proposes that initial Commission guidance could resemble this format.

FIGURE 6: PROPOSED DSP INVESTIGATION SCOPE

	Pre-Launch	Phase 1: Baselining	Phase 2: Assessment	Phase 3: Refinement
Timeframe	February - March 2019	March 2019 – December 2019	January 2020 – May 2021	June 2021 - ongoing
Goal	Identify the focus of and process for a DSP investigation.	• Begin developing a knowledge-base for the major principles of DSP. • Develop guidelines to evolve the smart-grid report into a robust (initial) distribution system plan.	Review the current state of each utility's system, identify near- and long-term needs and next steps to get to optimization.	Refine planning process, incorporate additional considerations and requirements
Process	• Staff whitepaper released: Outlines Staff proposal for DSP investigation. • Scoping workshop: Stakeholder feedback on Staff proposal i.e., establish whether OPUC has outlined the correct drivers, outcomes, phases, goals and deliverables. • Public meeting memo: Staff's final proposal requesting investigation.	• Workshops: Staff will conduct a series of workshops to establish a baseline understanding of distribution system planning fundamentals, current utility processes, and outstanding distribution planning needs. • Draft guidance: Staff releases draft proposal for DSP guidance. • Stakeholder comments/ workshop(s) as necessary. • Revised draft guidance • Final comments • Public meeting memo: Staff final proposal for DSP guidance.	• Establish individual dockets for each utility • Utilities file based on Commission guidance (~ 8 months) • OPUC and stakeholder engagement process (~ 6 months) ▪ Comments ▪ Workshops • Public meeting memo: Staff final recommendations (~April 2021)	• Continue to implement planning process as directed by Commission • Improve and evolve content, process, tools, and methodologies • Continue to incorporate evolving policy and operational requirements
Key Objective	Commission order opening investigation	Commission order adopting guidance for utilities to file initial DSPs	Commission orders accepting utilities' initial DSPs and direction to refine DSP process and/or DSP guidance	Commission acknowledgement of action plan and guidance for refinement of subsequent utility DSPs

Following the release of this whitepaper, Staff will hold a workshop to refine the proposed drivers, outcomes, and scope. Staff will incorporate feedback from the workshop into its proposed investigation and submit a formal request for the Commission to open the investigation. The subsequent phases, goals, milestones, and objectives will be shaped by feedback from stakeholders and any additional Commission guidance.

Conclusion

Since the initial Smart Grid Reports were filed in 2013, the OPUC, utilities, and stakeholders have been thoughtfully engaged in an effort to understand and adapt to an evolving distribution system landscape. As technology, policy, markets, and consumer interests evolve, regulatory structures must adapt to adequately consider these new and significant opportunities, uncertainties, and risks. Based on the need for insight and optimization, Staff proposes a thoughtful, phased approach to begin necessary steps towards transparent, robust, and holistic distribution system planning.

Attachment A – Invitation to Initial Scoping Workshop

Invitation to Distribution System Planning Workshop

Staff of the Public Utility Commission of Oregon (OPUC) will hold a scoping workshop to discuss and solicit input regarding an investigation into distribution system planning (DSP):

Date: Friday, March 1, 2019

Time: 9:30 a.m. – 12:30 p.m.

Location: Portland State Office Building
Room 1A
800 NE Oregon St, Portland, OR 97232

Workshop overview

Expectations for Oregon's electrical grid are changing. Technological advancements in grid infrastructure and distributed energy resources, combined with declining costs, evolving policies, and changing consumer interests are driving greater consideration for investments on the distribution system. OPUC Staff (Staff) believes that a holistic regulatory framework is necessary to ensure utilities are best positioned to capture customer value during this transition to a modern grid.

In the coming weeks, Staff plans to release a whitepaper outlining its proposal to launch a DSP investigation. At this March 1st workshop, stakeholders will provide feedback on Staff's proposed investigation. Following the workshop, Staff will modify its proposal as needed and request that the Commission launch an investigation into DSP at a public meeting.

Logistics

Staff's whitepaper, an agenda for the workshop, and call-in information for the workshop will be provided to this distribution list in advance of the March 1st meeting.

Please direct questions to:
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If you have a disability and need accommodation to participate in this event, please let us know:
(503) 480-9427 or caroline.f.moore@state.or.us

Attachment B – Background Reading List

Below is a non-exhaustive list of resources that may provide helpful context for readers of this whitepaper and participants in OPUC's DSP Investigation.

Oregon's Smart Grid Reports

- Latest smart gird reports:
  - Idaho Power Company: https://edocs.puc.state.or.us/efdocs/HAQ/um1675haq132224.pdf
  - PacifiCorp: https://edocs.puc.state.or.us/efdocs/HAQ/um1667haq11754.pdf
  - Portland General Electric: https://edocs.puc.state.or.us/efdocs/HAQ/um1657haq16327.pdf
- Commission Smart Grid Guidance: https://apps.puc.state.or.us/orders/2012ords/12-158.pdf

Industry Background Materials

- USDOE Grid Modernization Report (Vols. 1-3):
  - Vol. I Customer and State Policy Driven Functionality: https://gridarchitecture.pnnl.gov/media/Modern-Distribution-Grid_Volume-I_v1_1.pdf
  - Vol. II Advanced Technology Market Assessment: https://gridarchitecture.pnnl.gov/media/Modern-Distribution-Grid_Volume-II_v1_1.pdf
  - Vol. III Decision Guide: https://gridarchitecture.pnnl.gov/media/Modern-Distribution-Grid-Volume-III.pdf
- Distribution System Planning – State Examples by Topic: https://epe.pnnl.gov/pdfs/DSP_State_Examples-PNNL-27366.pdf
- Distribution Systems 101 Webinar: http://nasuca.org/resources/webinars/distribution-101/
- Distribution System Planning 101 Webinar: http://nasuca.org/resources/webinars/utility-distribution-planning-101/

Process Example: Minnesota PUC

- Utility and stakeholder questionnaire (Document ID: 20174-131044-01): https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={307DE9F3-1F36-4CB1-AABA-96F0FCA6B1A8}&documentTitle=20174-131044-01
- Commission order approving integrated distribution planning filing requirements for Xcel Energy (Document ID: 20188-146119-01) : https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={F05A8C65-0000-CA19-880C-C130791904B2}&documentTitle=20188-146119-01
- Xcel's initial Integrated Distribution Plan (Document ID: 201811-147534-01): https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={E098D466-0000-C319-8EF6-08D47888D999}&documentTitle=201811-147534-01

The present system: Current distribution system planning and operations	**The future system:** Where distribution system planning and operations are heading
• **Utility planning practices** o The suite of distribution planning processes and whether they have evolved over time o Data and modeling used in distribution planning ▪ Forecast methodologies e.g., DER forecasts, electric vehicles (EVs), whether utilities forecast QFs locationally, whether utilities forecast areas of high penetration of energy efficient buildings ▪ Existing assumptions ▪ The levels of granularity available and used o Planning and investment timelines and timescales o The processes to identify system needs and solutions ▪ The role of research and development ▪ How customer needs and interests are considered o Characteristics of distribution system planning, such the fact that distribution system attributes change more rapidly than the bulk system o Planning principles, e.g., how utilities manage risk and uncertainty, how utilities balance grid needs and cost shifting o Shortfalls and risks associated with existing processes o Challenges to planning for DERs • **The state of utility plans and systems** o Short and long-term investment plans by regions/areas o Existing roadmaps and smart grid activities e.g. AMI utilization ▪ The mix of modern and traditional technologies in service o Existing data and metrics ▪ Location and size of existing DERs ▪ The DER contribution to peak ▪ Distribution substations and other "mainline" infrastructure ▪ Communications infrastructure, such as scada ▪ Reliability and resiliency metrics o Current valuation models (and what is missing or out of date) o Customer demographics, differences between classes • **Distribution system engineering and operations** o Distribution system 101 ▪ Components such as meters, feeders, reclosers ▪ Demand v energy ▪ Net load v capacity o Engineering basics, requirements, and standards such as IEEE 1547 o Protection and safety o How utilities integrate and manage DERs, including barriers and flexibility • **Related regulatory and utility practices** o How utilities recover investment costs and develop rates o How distribution planning connects to transmission planning	• **Emerging technologies and tools** o Data management, visualization, and sharing tools o Automation technologies o Advanced inverter functions (solar specifically) o AMI utilization o IT systems and software o Microgrids, energy storage, EVs, and other DERs o Reliability, safety, major events preparedness and recovery in remote communities o Advanced valuation methodologies ▪ The value of behind the meter solar + storage ▪ The value of resiliency ▪ The value of deferring distribution system investments ▪ Locational value of DERs ▪ Mechanisms for sending price signals ▪ How to consider value to customers and value to the utility o Non-wires solutions v. typical wires solutions o The timescale of deploying tools and interoperability o Third party aggregators and other services • **Developing a shared roadmap** o Where utilities want to be in the future o Where other stakeholders want to be in the future • **Engaging customers in DSP** o Understanding customer needs and expectations o Measuring customer interests and value propositions o Customer knowledge level e.g., understanding of DSP concepts, familiarity with regulatory processes o Communication and education channels • **Considerations for evolving DSP** o Managing customer price impacts ▪ The trade-offs for various customer classes ▪ How costs associated with DSP should be allocated o Data security and privacy, including third party access o Accuracy and timeliness of data o The rate of technology change and determining the correct time to invest? o How will new programs and investments will impact reliability o The role of interconnection in DSP o How planning processes and decisions can be more transparent o Sharing best practices among utilities o Opportunities to coordinate with public power o The time and resources required for DSP (compared to the existing process and compared to the benefits)