

Business before Technology:

Putting Vision into Practice with a DER Operating Model



How do you move from old practices to new norms with the growth of DERs?

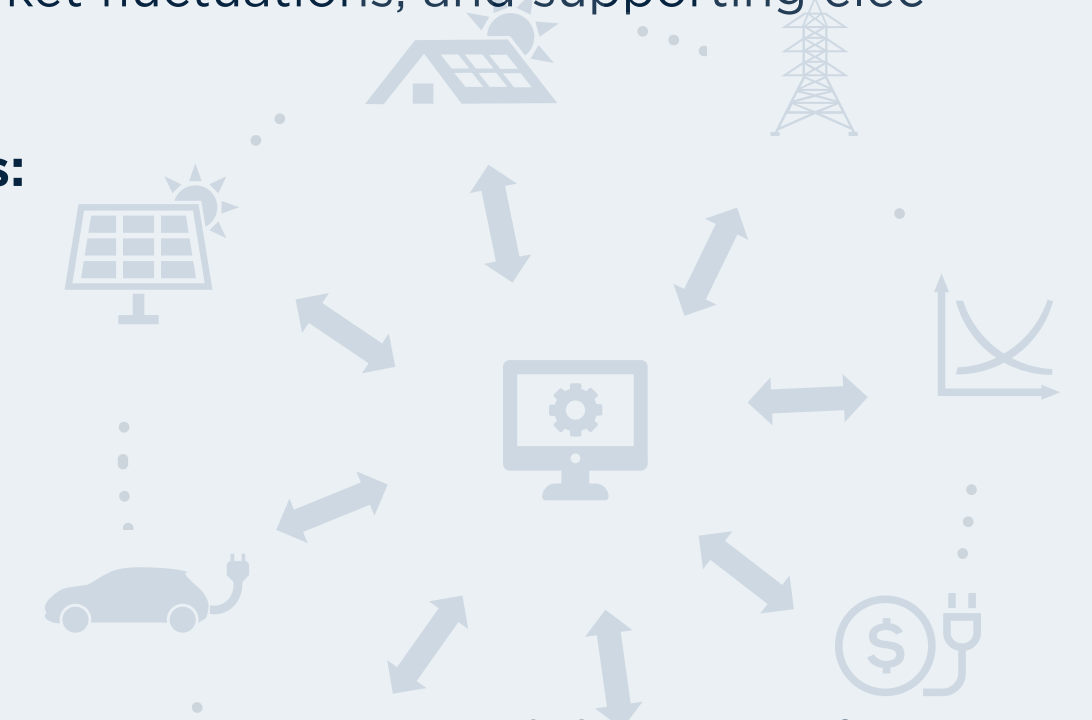
INTRODUCTION

Energy resources on the distribution system (DERs) hold great promise for: balancing the inherent intermittency of renewables, addressing transmission constraints, responding to climate events and market fluctuations, and supporting electrification. Properly orchestrated, DERs equip utilities with the key capabilities needed to meet 100% clean energy targets while safely providing everyone with reliable energy at an affordable price.

Realizing the value and benefit of DERs is so much more than a DERMS implementation. Utilities, End Users, and Stakeholders have observed several challenges in enabling growth and scale of DERs:

- ◆ Commitment from System Operators due to new technology and an unfamiliar type of generation for capacity
- ◆ Enabling the necessary scale of DER devices to reach the promised value and benefits of DERs as a resource
- ◆ Breaking down silos to coordinate DER contract pricing with merchant/trade floor requirements
- ◆ Inconsistent resource reliability from DERs that is necessary to justify dispatching for resource adequacy

Puget Sound Energy and West Monroe Partners are advocates for designing a 'DER Operating Model' to address the cross-functional business challenges when setting out to achieve your broader clean energy goals. PSE and the State of Washington have established aggressive clean energy/net-zero emissions targets through 2045 and scaling DER adoption and dispatching for grid services is integral to those goals. We share a best practice framework, lessons learned from PSE's journey, and key outcomes since establishing their DER Operating Model. When adopting a DERMS solution, having a clear roadmap to manage the cross-functional business transformation is necessary to achieve the level of scale necessary for unlocking the true value of DERs.



OPERATING MODEL FRAMEWORK

Methodology



At the foundation of this framework is a robust **Change Management Strategy** that can guide the business transition as the technology stack is sourced and integrated into business operations

Lessons Learned when developing a DER Operating Model

Invest the time to learn: Utilities with early DER growth and vendors across the value chain bring unique perspectives and learnings. Leveraging their insight can improve implementation and accelerate development.

Establish a clear and concise vision: DER technology has a wide range of opportunity and having a unified vision of your DER business model is foundational to moving forward together.

Ensure strategic business alignment: Motivating established business structures to change for new technology capabilities requires executive support and alignment to corporate objectives.

Commit to development: To implement new capabilities into the business it is important to have dedicated resources to figure out the technology and organizational structures fitting to the business objectives.

Clarify the DER operator: Defining who the scheduler and operator of the DERs is helps to create an anchor in developing other needed roles and responsibilities.

Prepare for change management investment: Several business units will need to adopt new skills, technology, and processes. Ensure robust internal communication, process definition, and training planning are included in enablement roadmaps.

Anticipate customer communication complexity: As you scale DER programs, determine effective communication techniques or bundling of programs to minimize customer fatigue.

RESULTS AND OUTCOMES FOR PUGET SOUND ENERGY

Established a Virtual Power Plant orchestrated by PSE that will scale to 140 MWs by 2025.

- ◆ Through a collaborative process with director levels of Distribution Operations, Transmission Operations, Generation Operations, Customer Products & Services and Energy Efficiency, **Distribution Operations was chosen for owning the DER scheduling and operations.**
- ◆ Using PSE's Operating Model Vision as the foundation, **created business case to justify additional people to be hired:** Distribution System Operations engineer, IT Applications resource, DER program managers, DER Engineer, DER Strategist, and DER Acquisition Managers.
- ◆ **PSE identified a needed capability to integrate equity** into the DER Operating Model. Subject matter expertise were hired into key departments to develop the method for incorporating equity into the work done: These team members established Customer Benefit Indicators as part of the valuation of DER options.
- ◆ In 18 months, **PSE was able to evaluate, procure, and operate a VPP platform** with one integrated DR program (and prepared to scale further).
- ◆ PSE has leveraged DER and VPP pilots to develop the DER programs and VPP structure in order to **lay the foundations for scaling.**
- ◆ **Leveraged diverse perspectives** from vendors and outside consultants to navigate use cases that have not been explored before internally or across benchmarked utilities.

Important Tools to drive business outcomes through executing the Operating Model Framework:

Grid Services for DER Enablement

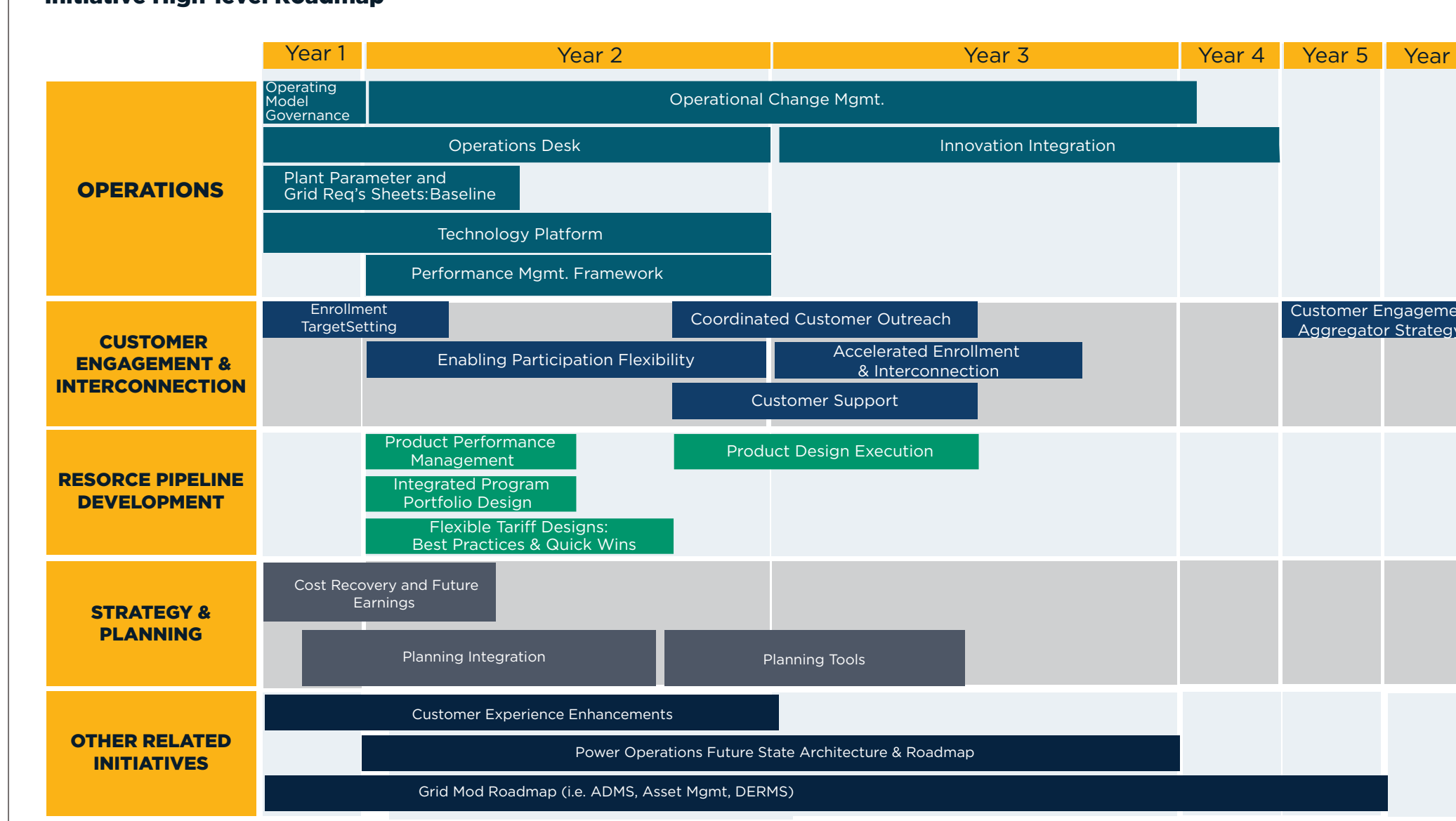
	PHASE 1	PHASE 2	PHASE 3
Scale over the next 1-2 years	Scale over the next 1-2 years	Scale in Years 2-3	Scale in Years 3-5 and beyond
Generation Capacity	Generation Capacity	Distribution Locational Benefits	Islanding (Utility Scale Microgrid)
Contingency Reserves	Contingency Reserves	Regulation	Defer Transmission & Distribution Upgrades
Frequency Response	Frequency Response	Volt/Var Control	Bulk System Voltage Support
Hourly Economic Dispatch	Hourly Economic Dispatch	Sub-hourly Economic Dispatch	
How Fast	No Notice	10 Minutes	1 Hour
How Often	Daily	When designated	When designated
How Long	Short Durations (e.g., 5 min)	1 Hour	1+ Hour
	DLC	DLC	
Smart Thermostat	Operational	Operational	Operational
Customer BESS	Operational	Operational	Operational
Utility - Owned BESS	Operational	Operational	Operational
Managed Charging	Operational	Operational	Operational

● Operational ● Capable and/or being implemented ● Not Available Currently

Aligning Operations with Customer Programs

Cross-functional business need to align on priority grid service needs and capabilities of existing flexible load and/or distributed generation programs

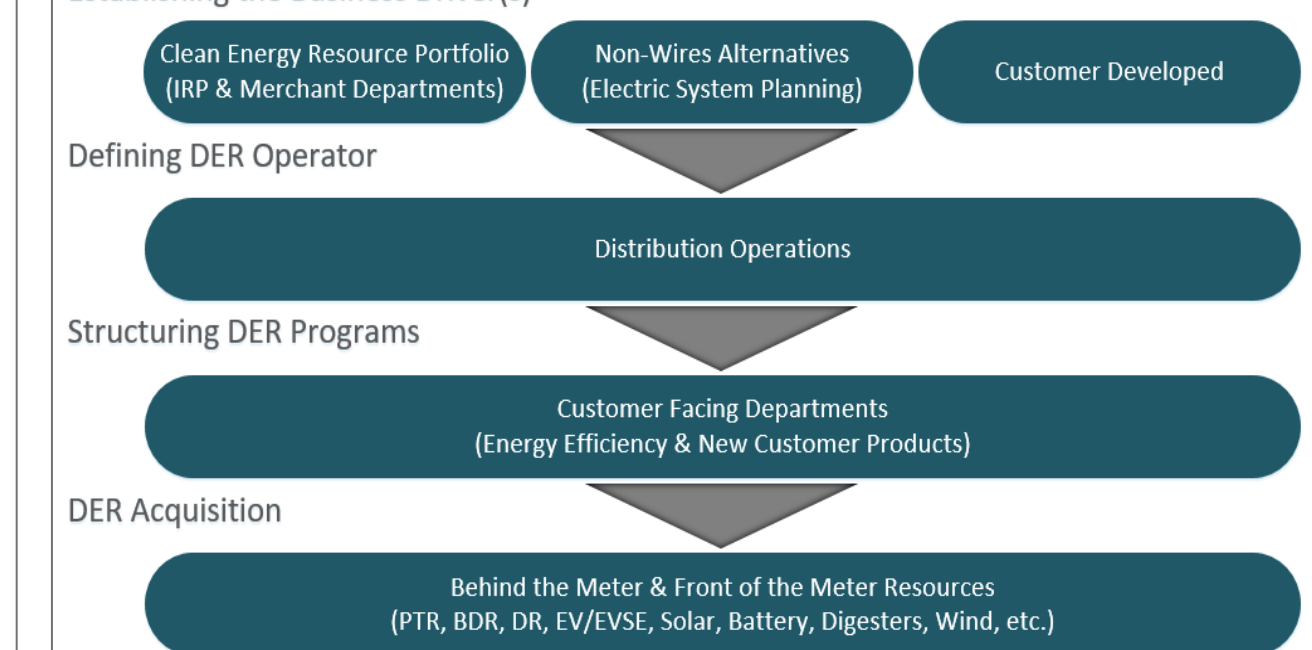
Initiative High-level Roadmap



Defining Implementation Roadmap

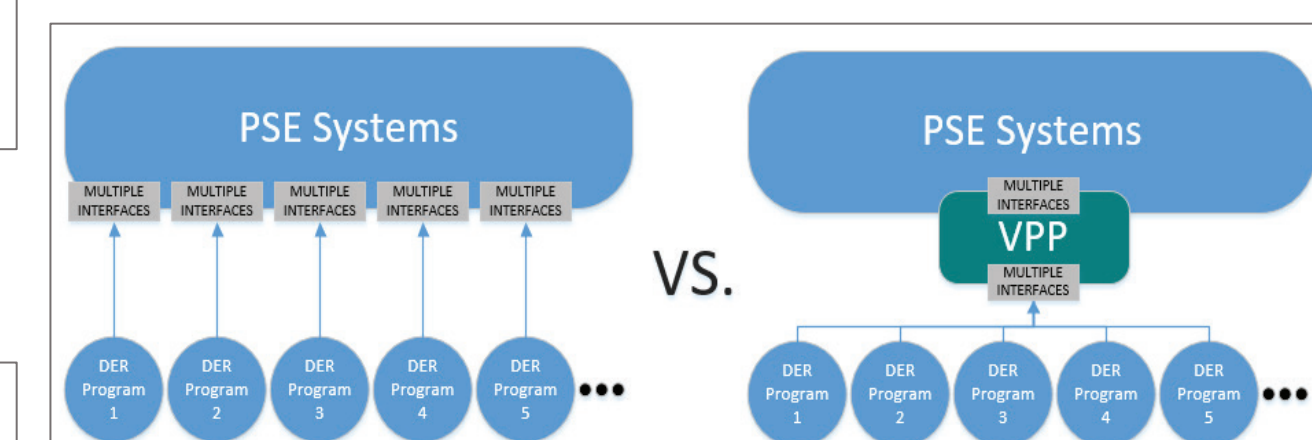
Change Management gets easier when a clear cross-functional roadmap is defined to identify interdependencies and chart one company path to DER growth

Establishing the Business Driver(s)



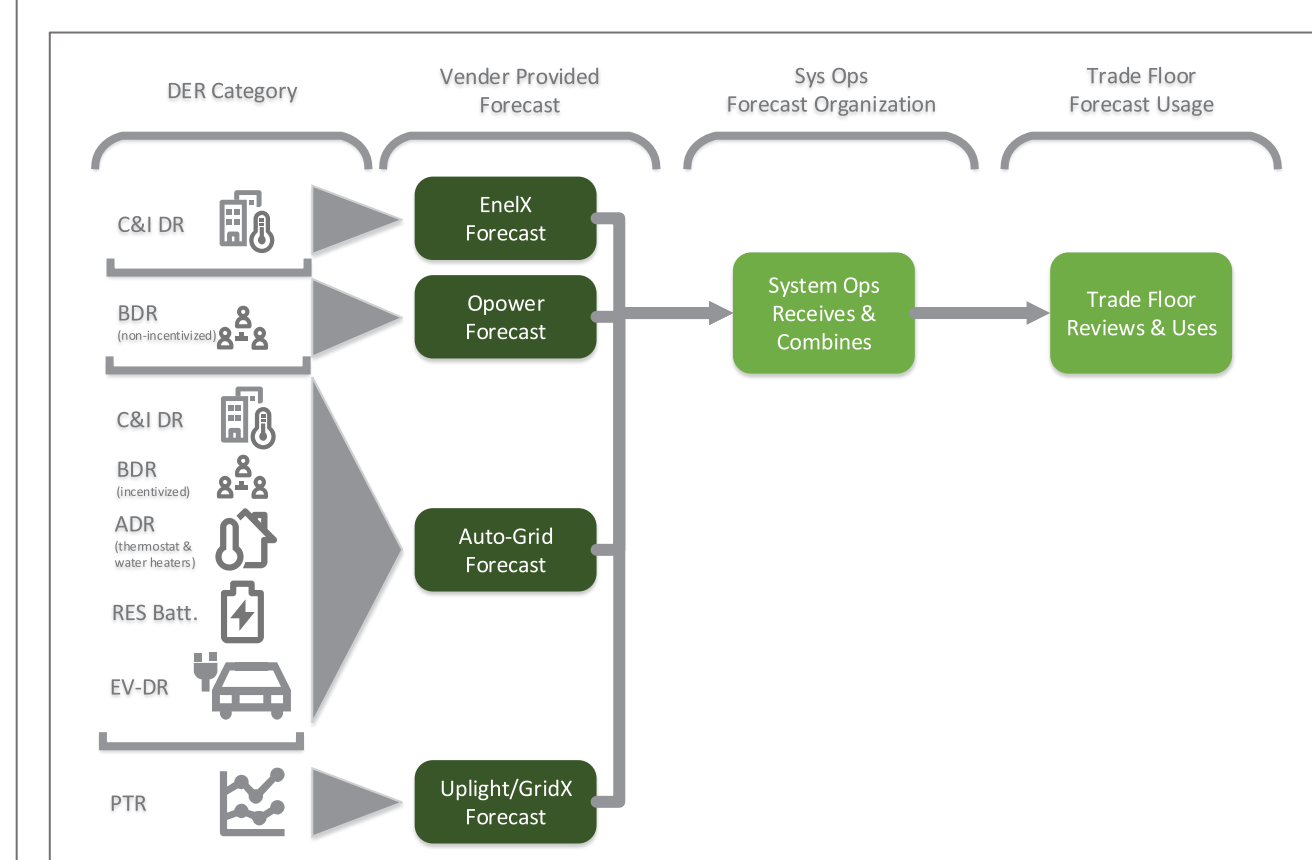
Establishing a clear Vision

The future state operating model will have defined roles and accountability to ensure effective DER enablement



Visualizing the Technology Maturity

Establish a path of evolution for the envisioned technology stack to support DER scale and adoption while meeting operational requirements



Process stages for DER forecasting from Source to the Trade Floor
Prepare to map new processes and hand offs between business units that have historically been siloed

In Conclusion

A well thought out DER Operating Model will accelerate your path to DER scale, bridge organizational silos, and enable technological maturity.