



Reporting Item

June 14, 2022

ITEM

Power with Purpose Reliability Update

PURPOSE

Provide reliability update on the Power with Purpose project for June 2022.

POWER WITH PURPOSE FACTS

1. The Power with Purpose generation project for new and modernized bulk natural gas generation and utility scale solar generation will support the District's growing communities, facilitate the District's generation retirement and refueling plans at North Omaha Station and maintain the District's system reliability and resiliency.
2. The schedule for the Power with Purpose project is critical for maintaining the District's reliability and resiliency.
3. As the District has been progressing with the Power with Purpose project, significant industry events and challenges have unfolded across the country which are impacting the original schedule for the District's Power with Purpose project.
4. Various mitigation measures have been undertaken by the District to resolve the Power with Purpose schedule impacts, but additional mitigation measures are needed.
5. In order to maintain system reliability and resiliency, the District is recommending a plan to mitigate the Power with Purpose schedule impacts.

RECOMMENDED:

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Brad Underwood
Vice President – Systems Transformation

APPROVED FOR REPORTING TO BOARD:

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L. Javier Fernandez
President and Chief Executive Officer

BRU: djl



Power with Purpose Reliability Update

June Committee Meeting

June 14, 2022



Agenda

- Power with Purpose Background
- Industry Events & Challenges
- Impacts on Power with Purpose
- Recommended Mitigation Plan
- Next Steps

Power With Purpose

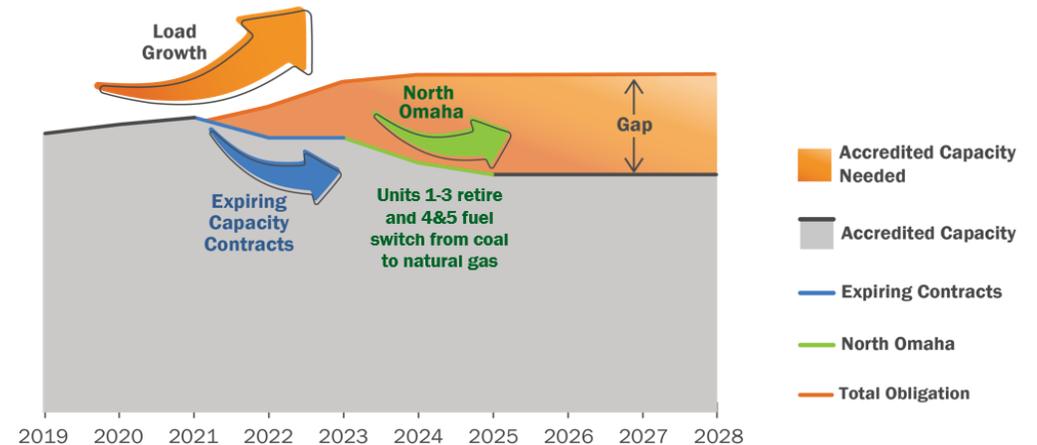
Background – Project Overview

- Power with Purpose (PwP) identified the need for both new natural gas and solar generation balancing affordability, reliability and environmental sensitivity
- The PwP projects:
 1. Allow for the planned retirement of North Omaha (NO) Units 1-3 and refuel of NO Units 4 & 5 from Coal to Natural Gas
 2. Facilitates large load growth
 3. Maintains critical and historical reliability & resiliency
- Creates a scenario where a significant amount of bulk generation changes are set occur where the coordination of “in service” dates is critical for successful project outcomes and maintaining system reliability & resiliency

Working Towards Solutions



Why Now: Continued Capability to Serve Our Growing Communities



Power With Purpose

Background - Changing Generation Landscape & Grid Reliability Risk

The Federal regulator over Grid Reliability, North American Electric Reliability Corporation (NERC), identified the quickly changing generation landscape across the country as a top risk to grid reliability

Grid Reliability Requirements:

- Thermal Capacity
- Voltage Profile
- System Stability & Frequency Response
- Load Ramping & Balancing
- Resource Adequacy

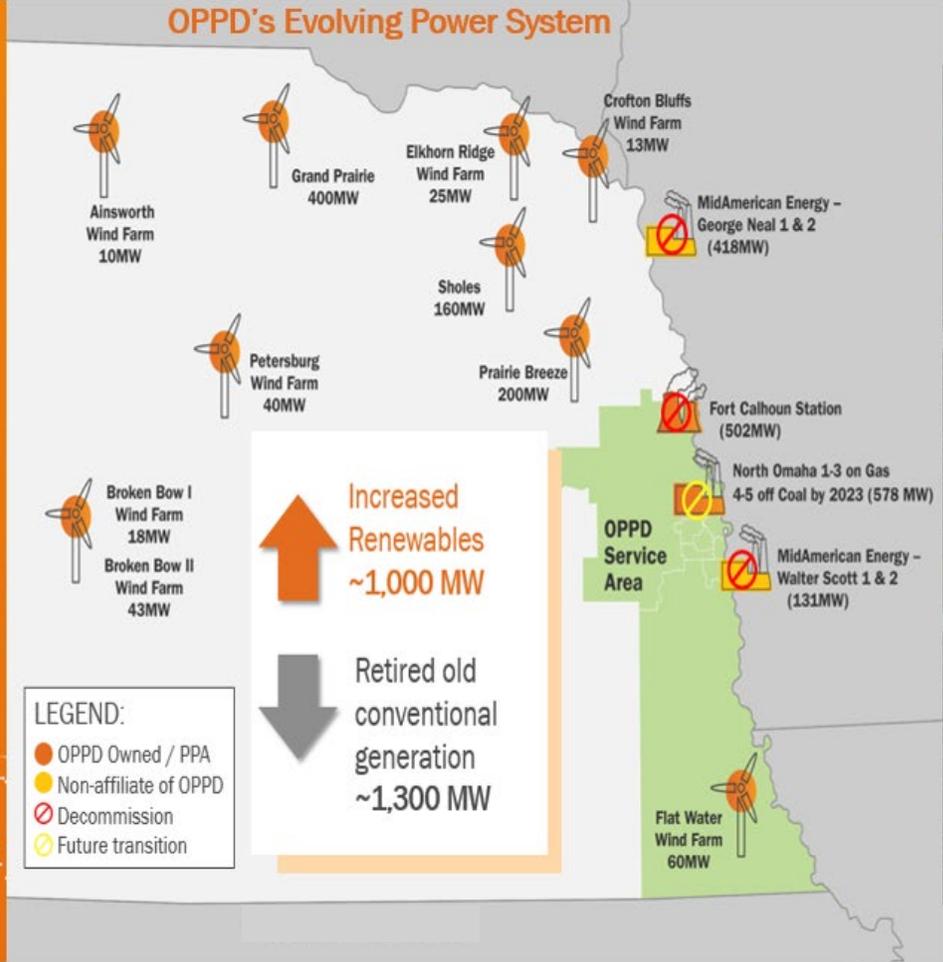
Solving for Reliability & Resiliency

Generation landscape has changed locally past 10 years

OPPD's system has maintained compliance with NERC **Reliability** Standards through these landscape changes.

OPPD experienced some extreme events which stress tested the **Resiliency** of our system.

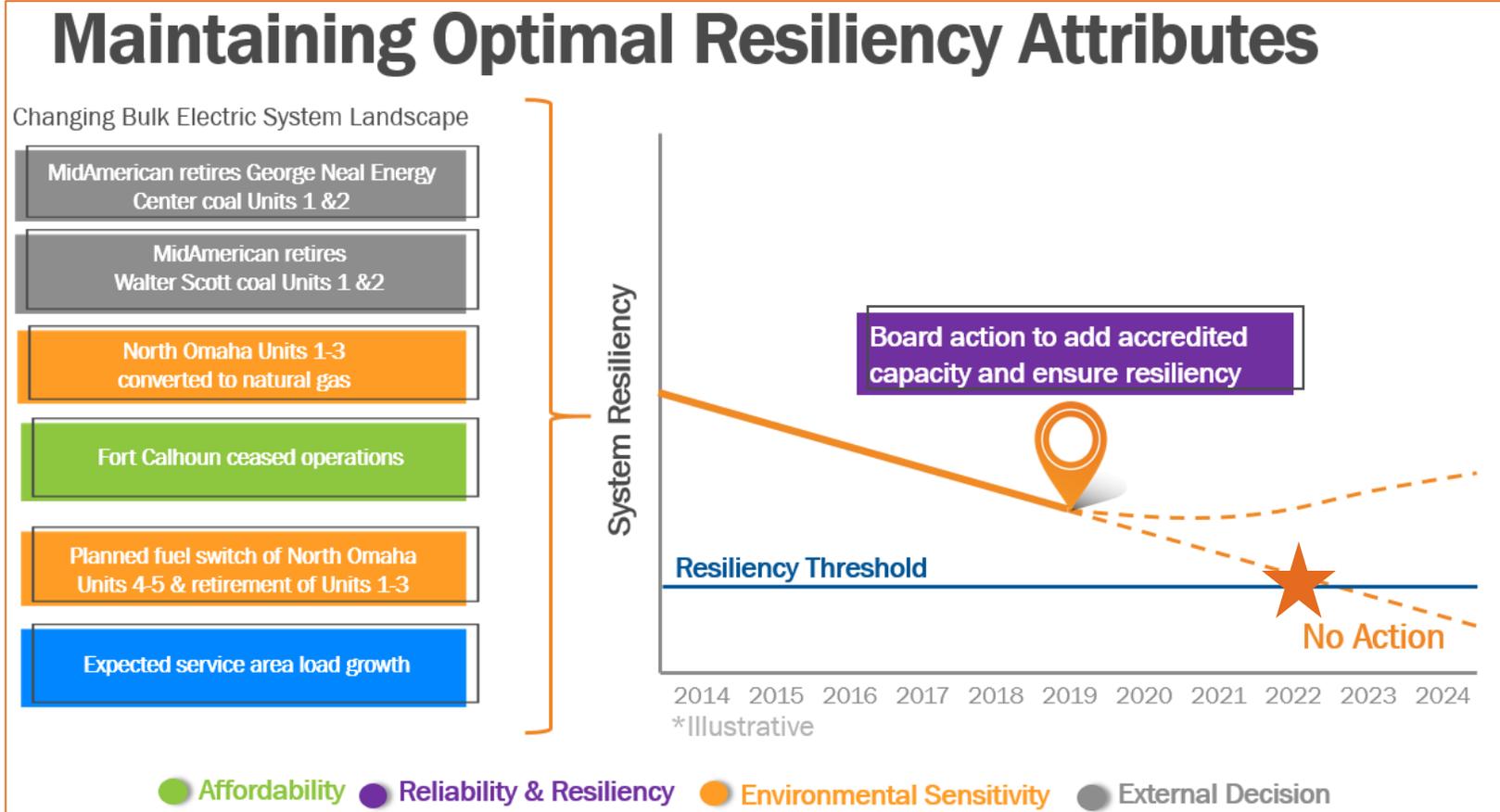
Our system passed these resiliency tests, however, our local resiliency margins have been impacted and are evolving...



Power With Purpose

Background - Maintains Reliability & Resiliency

- Changing Generation Landscape reduced OPPD’s local historic reliability & resiliency margins
- If left unmitigated, those reliability & resiliency margins would erode to unacceptable levels
- Power with Purpose maintains reliability & resiliency margins, supports load growth and facilitates North Omaha Station retirements / conversions



Industry Events & Challenges:

Changing Generation & Load Landscape

- Changing Resource Mix continues to remain the North American Electric Reliability Corporation's (NERC) top Grid Reliability Risk
 - NERC identified the Changing Generation Resource Mix as a top risk to grid reliability 3+ years ago, reaffirmed it as top risk in its recent annual assessment report and now this previously identified risk seems to be coming to fruition
 - OPPD's region, the Southwest Power Pool, forecasts sufficient regional generation supply for summer of 2022
 - Other Regional Generation Capacity markets across the country have generation supply concerns due to the Changing Resource Mix creating more bulk electric system risk
 - California (CAISO), Texas (ERCOT) & Midwest (MISO) regions all have concerns with generation deficiencies this summer, warning public of potential rolling blackouts

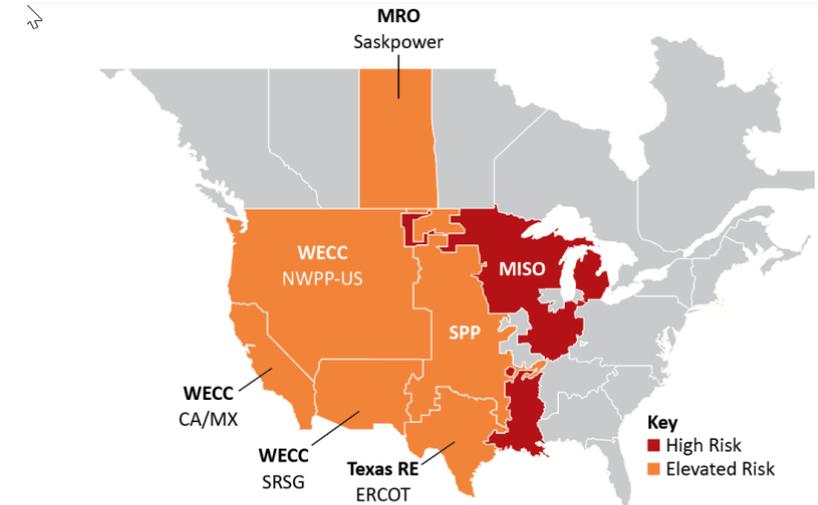
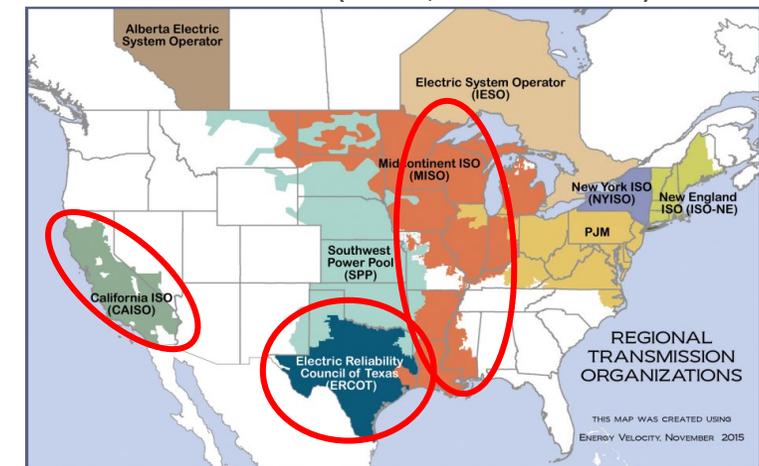


Figure 1: Summer Reliability Risk Area Summary

Seasonal Risk Assessment Summary	
High	Potential for insufficient operating reserves in normal peak conditions
Elevated	Potential for insufficient operating reserves in above-normal conditions
Low	Sufficient operating reserves expected

Projected Regional Generation Capacity Shortfalls: Summer 2022 (CAISO, ERCOT & MISO)

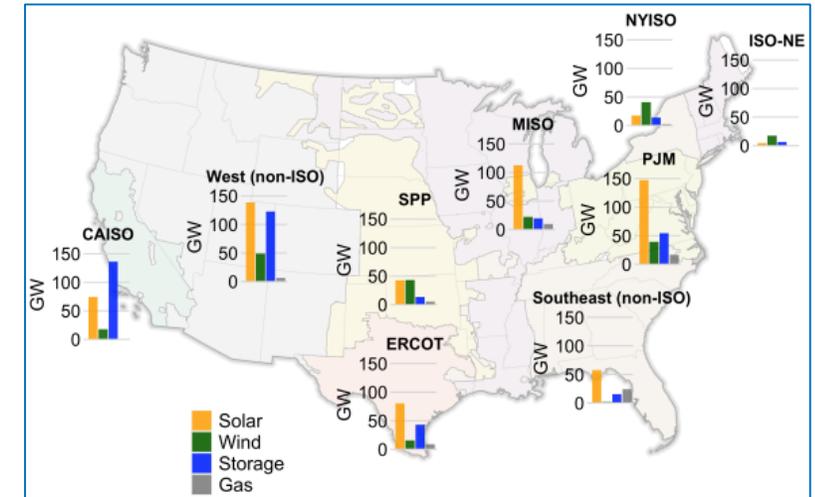


Industry Events & Challenges:

Regulated Grid Interconnection Study Backlogs

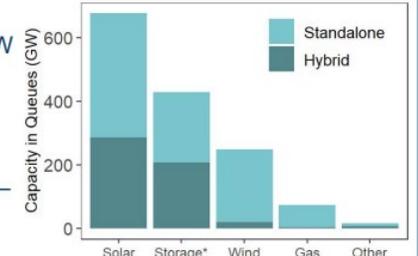
- Federally regulated Generation Interconnection (GI) request evaluation study process is backlogged across entire country
 - National landscape of interconnection queues shows exponential increase in new generation interconnections requests across the country
 - This has led to multi-year regional study backlogs which are becoming major impediments to adding new generation to the grid in a timely manner
 - These regulated grid reliability impact studies involve complex electrical engineering computer modeling simulations which determine transmission grid expansion requirements for any type of new generation
 - Interconnection request study processing durations have almost doubled from ~2yrs to ~4yrs in the last decade across the country and subsequent large transmission build out requirements becoming more commonplace

Regional Generation Interconnection Request Queues: Multi-Year Study Backlogs¹



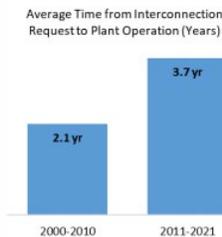
Developer interest in solar, storage, and wind is strong

- Over 1 TW (1000 GW) of generator capacity and 420 GW of storage currently seeking interconnection
- Most (~930 GW) proposed generation is zero-carbon
- Hybrids now comprise a large – and increasing – share of proposed projects



Completion rates are generally low; wait times may be increasing

- Only ~23% of projects that requested interconnection from 2000-2016 have reached commercial operations; 72% have withdrawn



- Completion rates are even lower for wind (20%) and solar (16%)
- For five regions¹ where data were available, the time projects spent in queues before being built increased from ~2.1 years for projects built in 2000-2010 up to ~3.7 years for those built in 2011-2021

¹ Berkeley Lab - Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection As of the End of 2020, May 2021

Industry Events & Challenges:

Other Regulatory Challenges

- Federal government continues to focus on solar supply chain imports
 - Uncertainty around tariff impacts from Department of Commerce anti-circumvention investigation
 - Recent announcement on executive action aimed at providing some near-term relief
- Local zoning challenges for critical generation siting
 - Sustained challenges across multiple counties in Eastern Nebraska

As a result of these solar challenges, the changing resource mix impacts on grid reliability and the backlogs and delays in the regulated grid interconnection studies, there are numerous examples of electric utilities across the country deferring conventional generation retirement plans and generation expansion plans

- *“Eversource scales back plans to add solar power by 2024, will keep Lawrence plant partially open”*
 - Kansas Reflector, 9/23/2021
- *“NiSource cites Commerce Department solar investigation in plans to delay coal plant retirements”*
 - Utility Dive, 5/5/2022
- *“PNM seeks to extend life of coal plant for summer demand”*
 - Santa Fe New Mexican, 2/17/2022

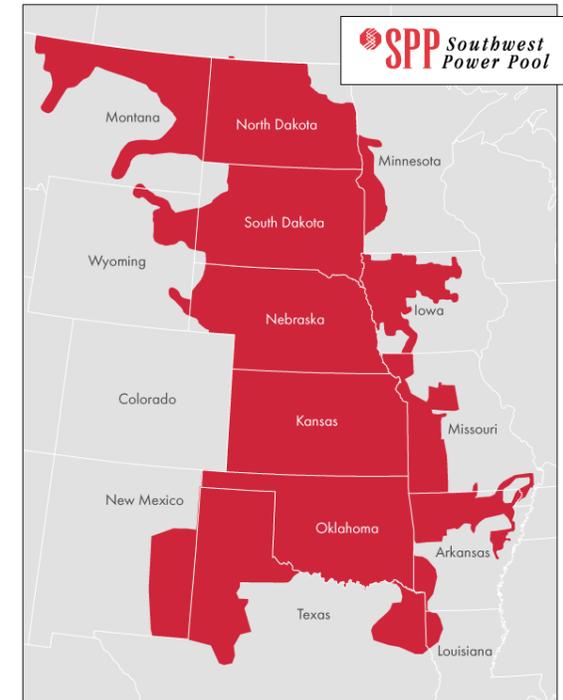
Industry Challenges Impact on Power With Purpose

OPPD's Generation retirement, refueling and expansion plans

- North Omaha Station units 1-3 retirements and conversion of units 4-5 from coal to natural gas set to occur by end of 2023 in accordance with previous Board resolutions
- Power with Purpose assets were originally targeted for commercial operation in Summer / Fall 2023 which would have been prior to North Omaha Station retirements and conversions

Outstanding Current Challenges

- Supply Chain and other project execution issues challenging construction of gas assets by end of 2023
- Zoning regulations and the federal focus on solar panel imports are challenging progress on solar assets
- Regulated Generation Interconnection (GI) multi-year study backlog poses most significant risk and impact to all of the PwP gas and solar generation
 - OPPD is part of the Southwest Power Pool Regional (SPP) Transmission Organization which is responsible for overseeing the regulated grid interconnection process in this region
 - Similar to every region across the country, SPP's GI process is significantly backlogged and delayed which is impacting our PwP generation in-service dates



Industry Challenges Impact on Power With Purpose

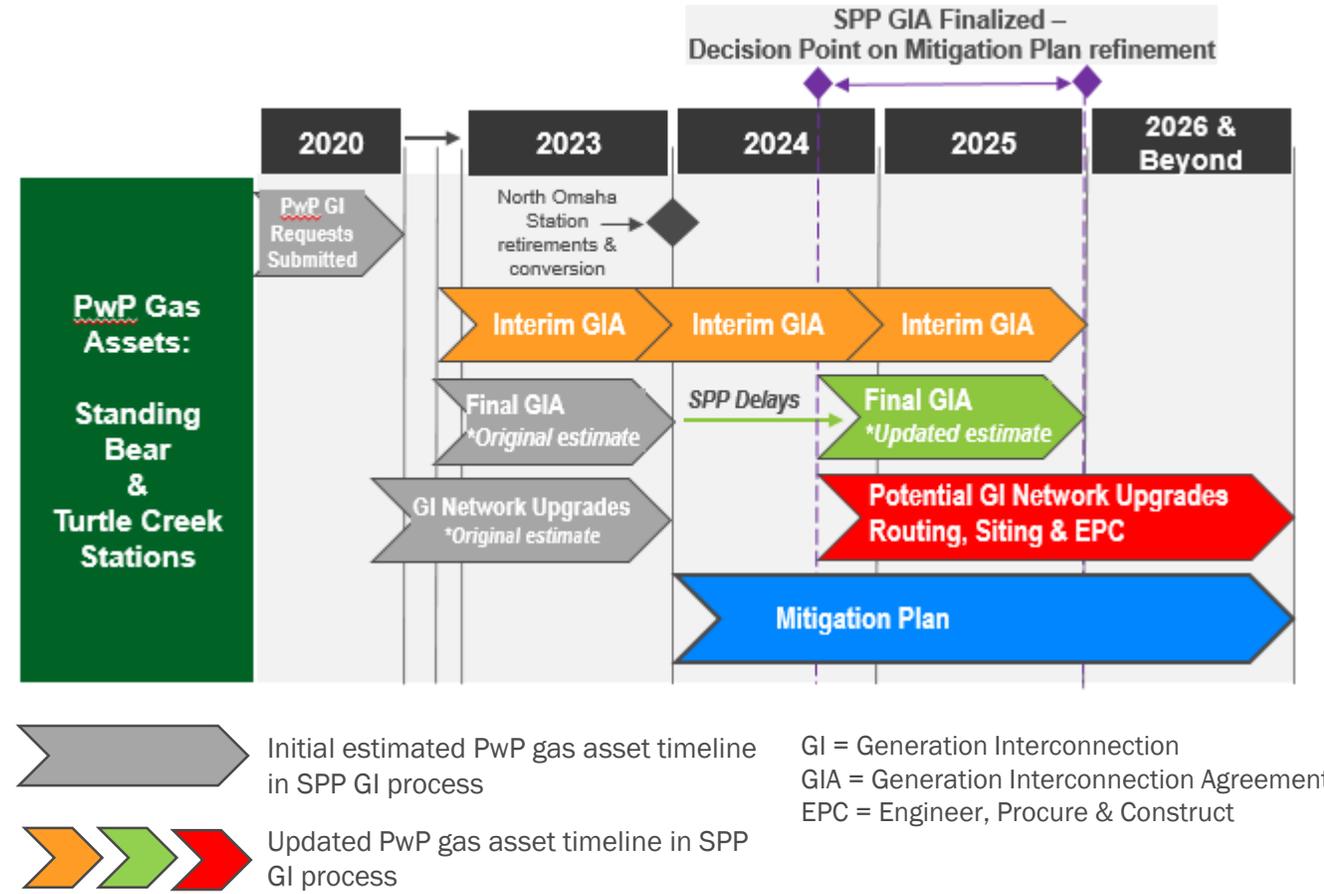
Generation Interconnection Backlog Mitigation Efforts

Numerous plans were put in motion to mitigate the federally regulated, SPP administered regional Generation Interconnection (GI) study backlog:

- Generation site selection criteria included optimizing existing transmission grid capacity
- Established GI queue positions in early 2020 with an estimated ~2.5 year SPP study duration
- SPP GI study backlog landscape drastically changed, request processing times doubled and massive regional transmission network upgrade buildout requirements being identified
- Interim interconnection service option being pursued for PwP but running into roadblocks
- Continued advocacy for regulatory policy reform at SPP and at the Federal Energy Regulatory Commission (FERC) by OPPD staff

Despite these mitigation efforts, the backlogged Generation Interconnection process has not been resolved for our PwP generation and a new mitigation plan needs to be considered

SPP Generation Interconnection Timeline for PwP Gas Assets



OPPD Impact of Power with Purpose Delay

System Reliability & Resiliency

- Power with Purpose (PwP) generation expansion plan was originally intended to largely be put in service by Fall 2023 to facilitate the North Omaha Station unit retirement / conversions, to support OPPD's growing communities and to maintain reliability & resiliency
- The same industry events and challenges that are impacting generation retirement and expansion plans across the country are also impacting OPPD's plans and causing delays with PwP
- In order to ensure OPPD's Reliability & Resiliency margins are preserved to help prevent large scale blackouts, a mitigation plan for PwP generation delays is recommended to be put in place
- Based on the magnitude of the generation portfolio changes and the local and national challenges, very few options are available

OPPD Impact of Power with Purpose Delay

Options Considered

- Option 1: Retire North Omaha Station (NOS) units 1-3 and convert NOS units 4-5 from coal to gas as previously planned by 12/31/2023
 - Beneficial environmental impact of reducing emissions from NOS
 - Voltage stability and import capability would reduce by approximately 60% of current levels leaving the OPPD system degraded and in unacceptable condition
- Option 2: Defer NOS retirement / conversion date until there is certainty for PwP gas generation grid injection and operation
 - Maintains grid reliability & resiliency
 - The district will need to make additional investments for extending operation at NOS that are estimated to be less than the market revenues

Recommendation

Mitigation Plan – Option 2 – Extend North Omaha Station

- To ensure grid reliability & resiliency, extend North Omaha Station (NOS) in its current capability until all conditions, including but not limited to transmission network upgrade requirements, as set forth in the executed Generation Interconnection and Transmission Service Agreements for Power with Purpose gas generation have been satisfied
 - NOS current capability: Units 1-3 primarily operate on gas and Units 4-5 primarily operate on coal
 - Southwest Power Pool (SPP) Transmission Service Agreements and SPP Generation Interconnection Agreements anticipated by 2024-2025
 - Will re-evaluate this NOS extension for potential termination or further extension pending final SPP transmission network upgrade requirements
 - For planning purposes, prepare for extension of NOS in its current capability until at least 12/31/2026
 - Balance environmental impacts and reliability needs by exploring the possible options to minimize NOS coal unit emissions if system conditions allow along with pursuing interim grid interconnection service for PwP generation
 - Continue advocacy for energy regulatory policy reform for new grid interconnections regionally and nationally
- Expand large customer demand response programs, primarily commercial and industrial customers
- Continue to pursue critical Power with Purpose utility scale solar resources

Extend North Omaha Station Refuel & Retirement Dates

Extensive Impact to Various Areas of the Organization

- Staffing
- Additional maintenance and capital improvement work
- Additional fuel acquisition
- Permitting considerations
- Stakeholder outreach

Extend North Omaha Station Refuel & Retirement Dates

Next Steps

- Initiate plans to prepare for North Omaha Station (NOS) extension in its current capability while pursuing options to address environmental impacts and reliability needs
 - Board Work Plan for Strategic Directive (SD) reviews:
 - SD-9 Resource Planning – Evaluating potential revisions to clarify how reliability and resiliency are considered in integrated system planning (Q3 2022)
 - SD-7 Environmental Stewardship – Evaluating potential revisions to incorporate interim metrics as OPPD pursues our net zero carbon goal by 2050 (Q4 2022)
 - SD-4 Reliability – Evaluating potential revisions to narrow this SD’s focus on operational reliability metrics pending the outcome of revising SD-9 (Q1 2023)
- Continue advocacy for energy regulatory policy reform for new grid interconnections
- Continue evaluation of interim interconnection service options for Power with Purpose generation along with expansion options for demand response program
- Stakeholder outreach efforts commence from now until August Board Meeting
- Mitigation plan recommendation to be voted on at August Board Meeting

Communication & Outreach

IAP2 Level: Inform

- **OBJECTIVE:** Communicate local, regional and national challenges and changes to the electrical system landscape.
- **MEASUREMENT:** Ensure stakeholders understand the problem(s) we are addressing.
- **TACTICS:** Various, internal communications, external 1:1s, videos, industry articles, Speakers Bureau, website education, FAQs, etc.

TIMELINE

- **Mon., June 13** Employee communication
- **Tues., June 14** Board Committee Meeting
- **June 14 – Aug. 12** - Stakeholder & Customer Outreach
- **Thurs., June 16** Board Meeting; Wire story posted
- **July** No Committee or Board Meeting
- **Tues., Aug. 16** August committee meeting
- **Thurs., Aug. 18** August board meeting—Board Action

Communication & Outreach

Key Takeaways

- 1) Reliability & Resiliency are important to OPPD, and we are taking the necessary actions locally to address a complex and industry-wide issue. OPPD is not alone in experiencing challenges around supply chain and grid interconnection—all utilities are facing at least some of these challenges.
- 2) OPPD remains committed to achieving our net zero decarbonization goal and building a cleaner world.
- 3) Visit [OPPDCommunityConnect.com](https://www.OPPDCommunityConnect.com) for more information.