OPPD
Omaha Public Power District

Near Term Generation Update

March, 2023

February Recap

- OPPD is experiencing **historic load growth**, ~100 MW per year, up from a typical ~4 MW per year.
- **Power with Purpose assets** provide critical capacity and energy, support reliability and resiliency, and provide generation diversity that meets our demand to 2027.
- OPPD is **planning for generation resources** to serve our growing load beyond Power with Purpose for approximately 2027 to 2032.
- In addition to more energy supply resources, OPPD is constructing **transmission system expansion** and planning future transmission system projects to accommodate near- and long-term needs.
- Resource planning process is **guided by our mission** to provide affordable, reliable and environmentally sensitive energy services, our **strategic directives**, and our **legal and regulatory obligations**. Our energy services **power people, communities and the economy in Eastern Nebraska**.
- It is OPPD's **responsibility** and **obligation** to serve our customers and that is getting more and more difficult for a variety of reasons including local permitting, supply chain and federal policy related to generation interconnection.

Overview

- In 2022, thanks to stakeholder input, OPPD completed **Pathways to Decarbonization** to identify potential pathways to Net Zero by 2050.
- In the near term, OPPD is experiencing multiple factors, requiring a need to plan to **grow accredited capacity** beyond Power with Purpose. These include:
  - Continued rapid near-term load growth
  - More generation supply is required from an increasing Planning Reserve Margin (PRM)
  - Diminishing surplus of regional generation capacity
  - Significant extension of planning & execution time requiring more action, sooner
- OPPD and E3 are **studying near-term resources needs**, guided by OPPD's mission and long-term goals and building on Pathway findings. Our guidepost are:
  - *Affordable*: Economic, least-cost optimization
  - *Reliable:* Maintain OPPD's high historical levels of reliability
  - *Environmentally Sensitive*: 2050 Net Zero carbon target

Informing our Direction

Customer, employee and public feedback through workshops, surveys, etc.

Transition to broad communications

2019
Power with Purpose (PwP)

OPPD launches plans to add solar power and national gas to meet load growth through 2026.

2019-2021
Pathways to Decarbonization

- 6 workshops
- 400 attendees
- 700+ recording views
- 83.7% satisfaction

Study determines it is possible to reliably operate with a mix of renewable, storage, and low-carbon firm resources to achieve net-zero.

January 2022
Integrated Resource Plan

OPPDCommunityConnect Decarbonization Pages
- 10,500 visits
- 80 comments & questions

Regulatory plan finds that OPPD's forecasted load is fully supported through 2026 with new solar and natural gas resources (PwP).

June 2022
North Omaha Extension

PwP delays require OPPD to temporarily extend the capability for coal operations at NOS.

2023
Near-term planning

As part of on-going planning, OPPD studies how to meet growing energy needs.

GENERATION OUTREACH TIMELINE

2019
Power with Purpose

2019-2021
Pathways to Decarbonization

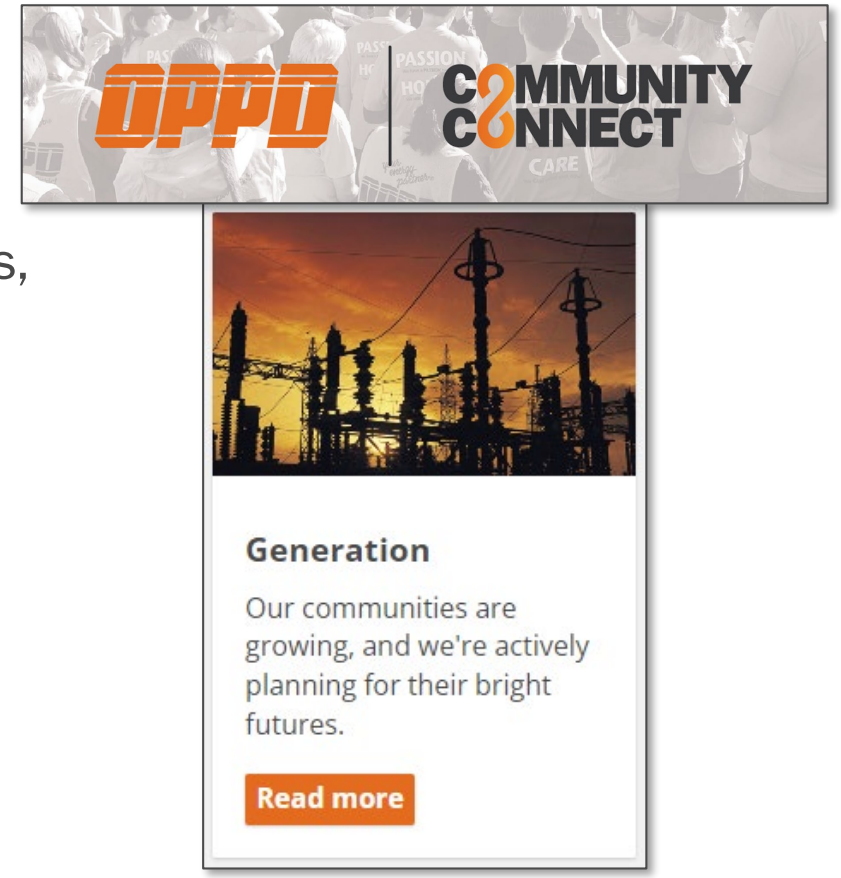
2022
Integrated Resource Plan

2022/2023
North Omaha Extension

Outreach and Engagement to Date

OPPD is committed to engaging customers, the community and other stakeholders around key decisions and providing meaningful ways for them to participate and provide feedback.

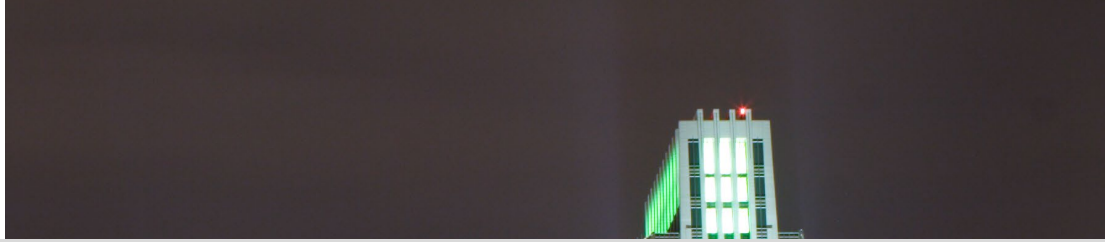
- OPPD Community Connect
  - OPPD's stakeholder engagement platform – follow along the journey
  - Project page dedicated to all projects, including Generation
  - Opportunity to ask questions, take surveys provide feedback
- Listening Sessions
- Master-class deep dive workshops
- 1:1 discussions



Pathways: Key Findings for Net Zero 2050

1. OPPD can achieve net zero while balancing affordability and reliability.
2. All scenarios cease coal generation and reduce use of fossil fuels.
3. Pathways require a mix of renewable energy, energy storage, and community-wide energy efficiency.
4. Firm (dispatchable) generation is needed to maintain resource adequacy.
5. Resources are consistent across a variety of pathways.
6. Achieving Absolute Zero is more costly and is dependent on future technology development.
7. Accelerating decarbonization reduces cumulative emissions at a relatively low incremental cost, but poses implementation and integration challenges.
8. The changing resource mix will pose new resiliency challenges that must be evaluated, understood, and mitigated.

Load Growth Acceleration



The State of Nebraska and local communities continue to invest in economic growth, and OPPD must be ready to enable that growth.

- State has dedicated **$110M** to site development in last two legislative sessions, up from $2M annually
- **$430M+** is proposed this legislative session
- The greater Omaha area had **61** new projects last year, totaling $2.1 billion capital investment
- Nebraska Department of Economic Development has clear economic **development** goals:
  - **Recruit** high-wage, high-tech job creators
  - Encourage **expansion** of existing firms
  - Develop first-rate sites to **attract** projects
  - Promote startups and small business

Load Growth

- We know the growth over the next 10 years will be significant and demanding and of proportions never seen be OPPD before.
- Bringing on new generation is now taking 6- to 10- years, so OPPD must make challenging decisions now.

Factors driving LOAD GROWTH

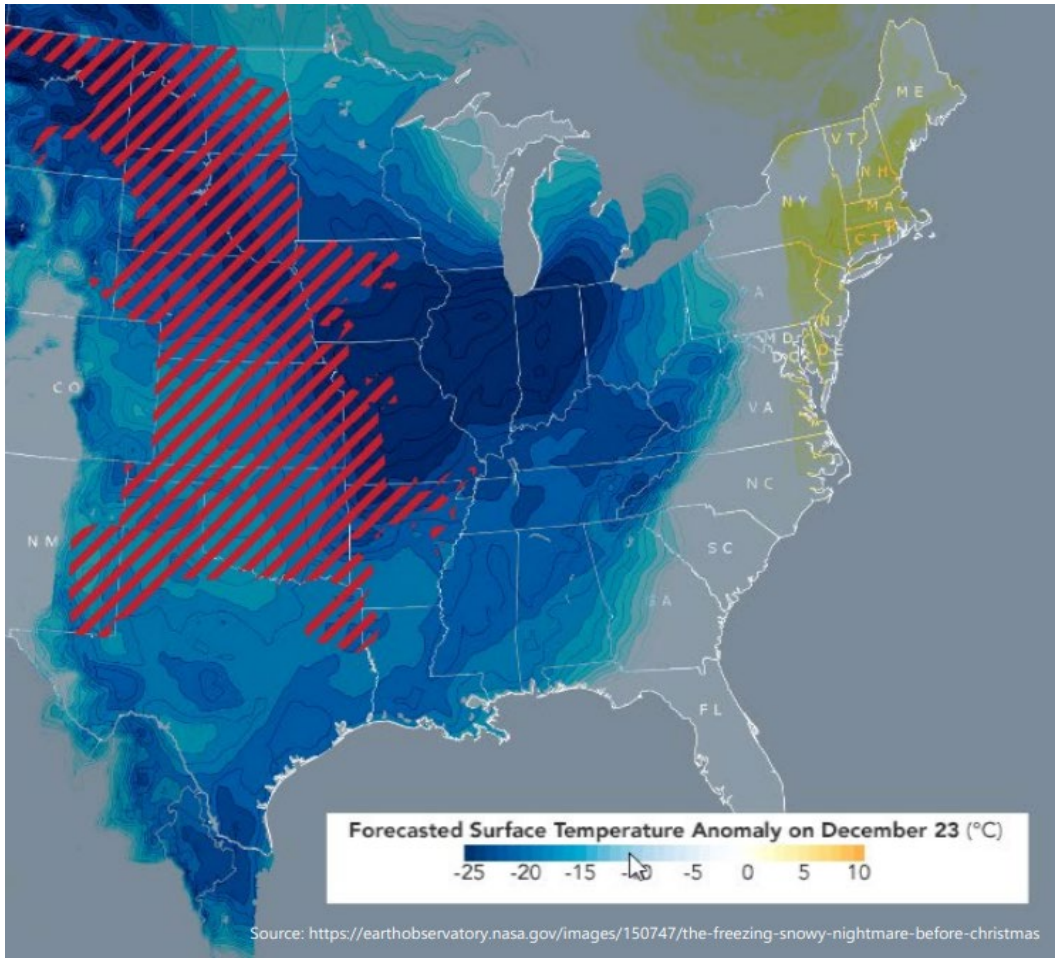
- Electrification
- Biotech
- Manufacturing
- Data Centers (Fintech)
- Food Processing
- Agricultural Processing

Factors driving LONGER LEAD TIMES

- Regulated grid interconnection study backlogs
- Solar zoning & Federal regulatory challenges
- Supply and workforce challenges
- Building at multiple sites is a significant incremental challenge to execution teams

Extreme Recent Events - Winter Storms

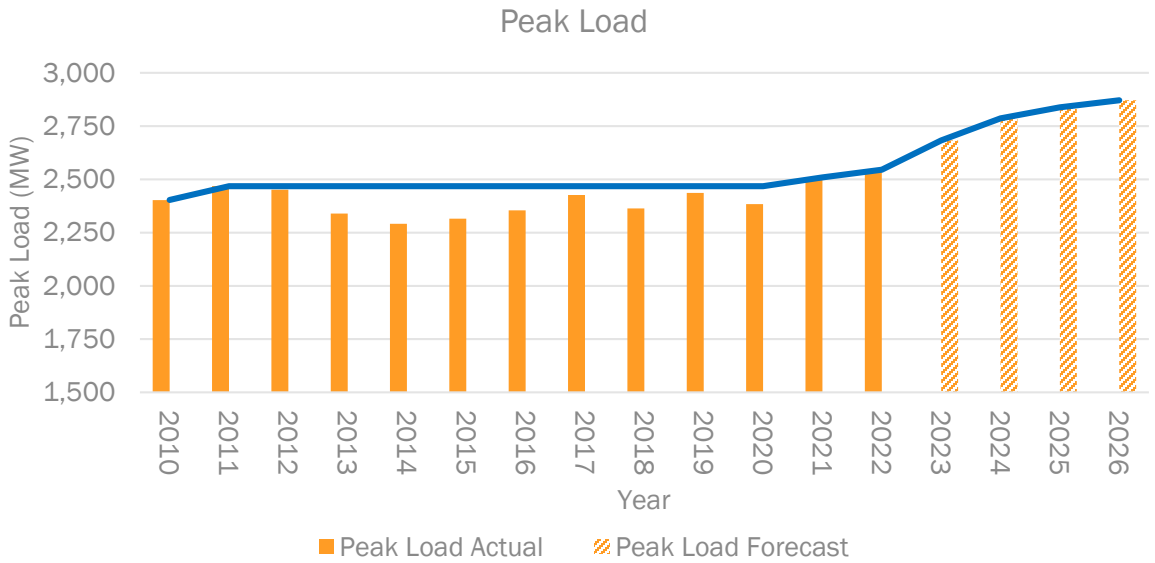
- **Resource and operational challenges** can contribute to **stresses** of extreme events, such as winter storms Uri and Elliott.
- During these extreme events **margin for disturbances is low** with typically all available resources in service and resource diversity remains critically important.
- Winter storm Uri was more impactful to OPPD requiring load shedding throughout SPP, and Elliott required load shedding in the Southeast U.S.



Winter Storm Elliott – Dec. 23, 2022

Recent Events – Temperature & Demand

- Peak loads continue to increase during both summer and winter
- SPP all-time peaks:
  - Winter peak: Dec. 22, 2022 (47,157 MW)
  - Summer peak: July 5, 2022 (51,090 MW)
- OPPD all-time peaks:
  - Winter peak: Dec. 22, 2022 (2,091 MW)
  - Summer peak: Aug. 2, 2022 (2,545 MW)



OPPD SUMMER PEAK

Aug. 2, 2022

High: 101˚F
Low: 77˚F
Average: 89˚F
2,545 MWs

OPPD WINTER PEAK

Dec. 22, 2022

Winter Storm Elliott

High: -2˚F
Low: -14˚F
Average: -8 ˚F
Wind Chill: -40 ˚F
2,091 MWs

Previous Peaks

July 29, 2021

High: 96˚F
Low: 79˚F
Average: 88˚F
2,509 MWs

Winter Storm URI

Feb. 14, 2021

High: -1˚ F
Low: -10˚F
Average: -5 ˚F
Wind Chill: -32 ˚F
1,824 MWs

Accredited Capacity

- While both summer and winter peak loads are increasing, OPPD's winter peak has increased in higher proportional magnitude than the summer peak in recent years.
- OPPD must have sufficient accredited capacity to serve its *seasonal* peak load plus SPP's Planning Reserve Margin for regional reliability. Without sufficient resources, OPPD won't be able to meet our regulatory requirements.
- Extreme weather highlights that regional margin requirements have been lagging as regions undergo load growth and a changing resource mix.
  - Far reaching affects of winter storms Uri and Elliott are examples
  - System challenges during these events have placed significant attention on winter PRM requirements
- Increases have occurred for SPP's summer margin requirements and are very likely to continue for both winter and summer to strengthen reliability. Even without load growth, this will require more resources.
- More strict regulatory requirements and enforcement are expected, especially for winter periods.

SUMMER

2022: 12%

Now: 15%

2025: 16%*

*expected SPP PRM

WINTER

2022: 12%

Now: 15%

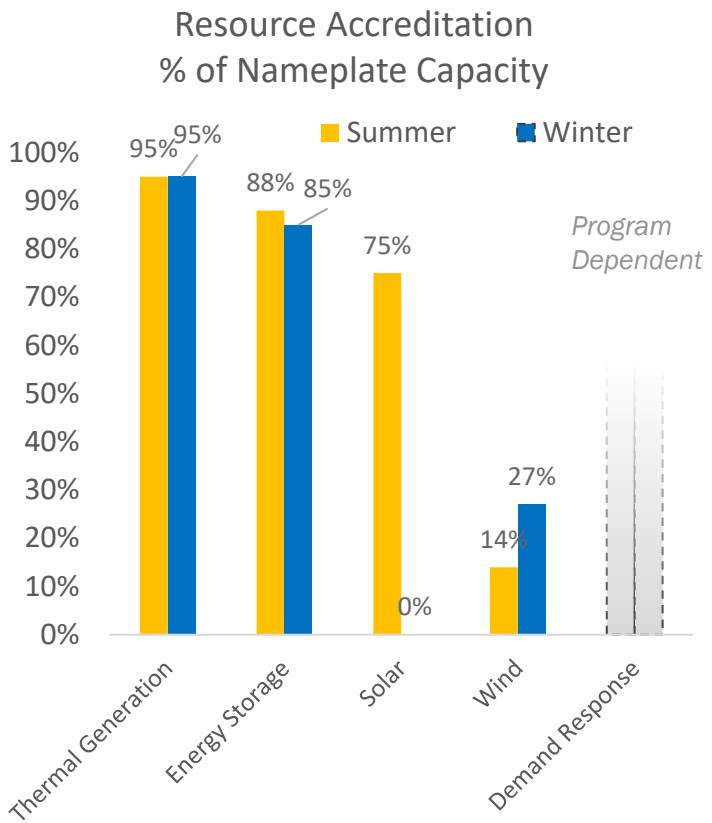
2026: 20%*

2028: 25%*

MISO requirement is currently 24.7%

SPP Accreditation Policy

- Seasonal accreditation values are dependent on the specific resource type and accreditation methodology.
- While thermal resources maintain high accreditation in both summer and winter, wind and solar vary and are based on the Effective Load Carrying Capability (ELCC)
- Demand Response accreditation is currently being revised by SPP's Supply Adequacy Working Group



	Performance- Based Accreditation (PBA)	Effective Load Carrying Capability (ELCC)	Net Peak Load Reducers
	Thermal Generation	Wind, solar, and energy storage	Demand response
STANDARD	Based on historical unit reliability	Captures performance over a wide range of historical weather conditions	Based on the individual utility's ability to reduce load. Reduces the amount of reserve resources required
WHAT'S NEXT	SPP considering more stringent firm fuel requirements for winter accreditation.	Values are not constant and reduce with increasing resource saturations	SPP is expected to change to ELCC-like approach, which would significantly reduce accreditation of these resources

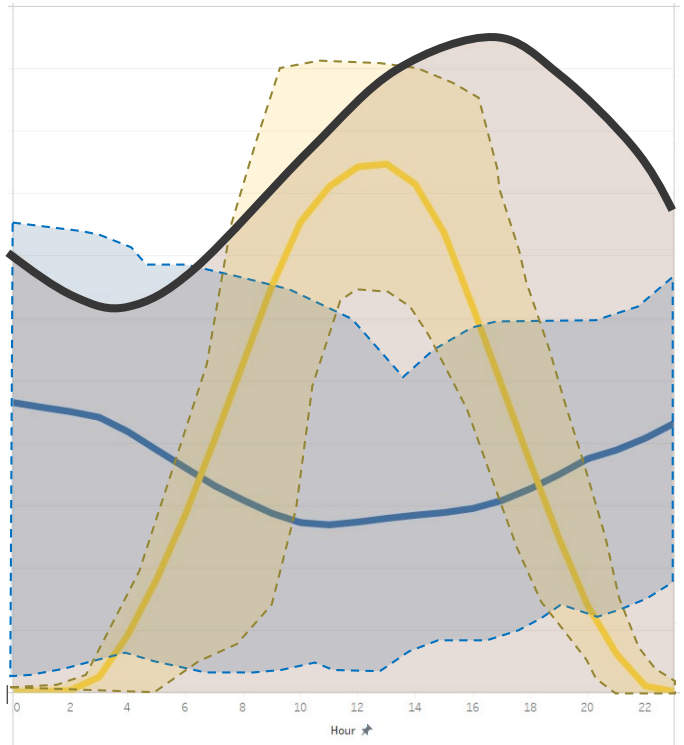
Example - Renewable Output vs. System Load

- Renewable resources have varying power output dependent on the time of day and season of year. The below graphics illustratively show average renewable production during peak summer and winter periods as well as the range of output during these times.
- While both wind and solar do provide system benefits, their reliability contribution is quantified through SPP's Effective Load Carrying Capability (ELCC) studies, which account for variability and periods of low production.

Summer Season Performance

Solar output is generally good during summer peak days.

Wind produces at lower levels during summer peaks.

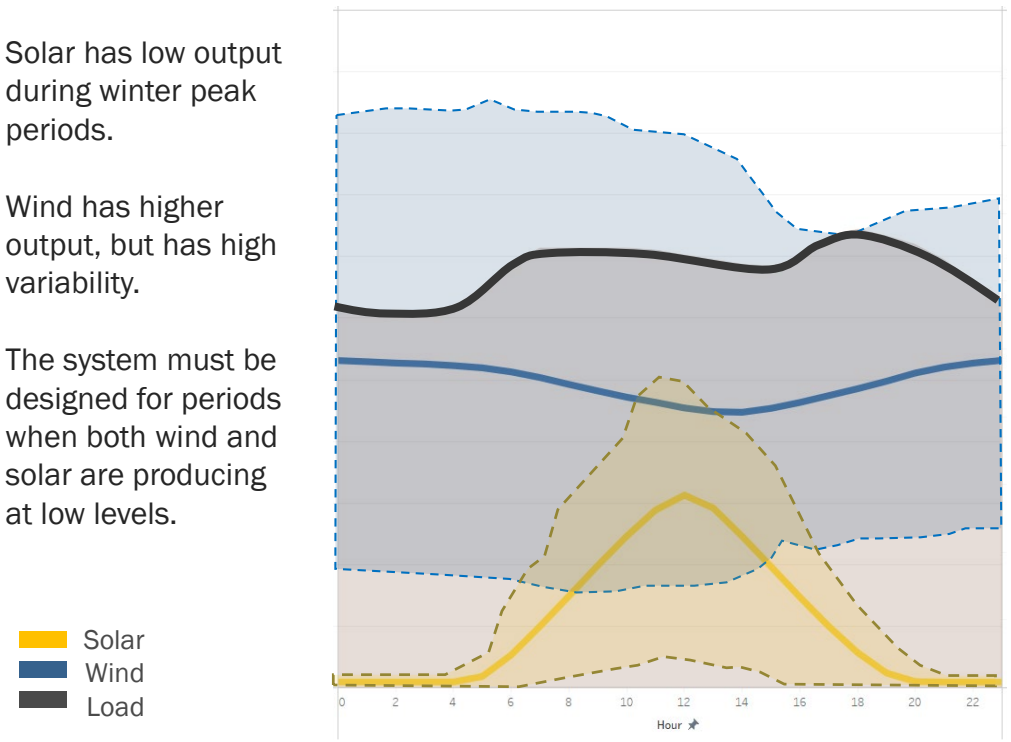


Winter Season Performance

Solar has low output during winter peak periods.

Wind has higher output, but has high variability.

The system must be designed for periods when both wind and solar are producing at low levels.



Likely Next Steps & Outcomes

- Continue the ongoing conversation on load growth in the community.
- Generation resource recommendations are expected to be a combination of renewables and continued expansion of dispatchable natural gas.
- Supporting infrastructure for those resources is expected to be required.
- These solutions are consistent with our 2050 goals.
- More detailed information in April and the coming months.

Photo credit: Andrey Metelev on Unsplash

GENERATION COMMUNICATIONS TIMELINE

December 2022
State of the Utility

Q1 2023
Power with Purpose
North Omaha Station
Solar updates
New resources

Q2 2023
Recommendation

Education Going Forward

OPPD continues to educate broader audience about our generation journey with focus on new transmission and generation to ensure understanding of situation / recommended solutions.

Use OPPD's broad communication channels to build understanding about load growth, as well as trust in our near- and long-term generation strategies as they evolve and continue. Examples:

- OPPDtheWire content
- Social media
- News releases
- Outlets bill insert newsletter
- OPPDCommunityConnect.com
- Community events, i.e. Earth Day
- Community relationships
- Customer conversations