

WESTERN ASSESSMENT of Resource Adequacy

Northwest Power Pool Northeast (NWPP-NE)

This section provides information on the Northwest Power Pool Northeast (NWPP-NE) subregion, which includes Alberta and parts of Idaho, Montana, and Wyoming.

While the demand-at-risk hours increase over the next eight years, they have substantially improved since last year's assessment due to adjustments to the subregion's demand forecast.

Variability in the subregion increases over the next 10 years; however, the increase is not substantial, in part because around one-third of the 11 GW of new resources planned for the subregion will be natural gas.

SUB-REGIONAL RISKS

The addition of almost 11,000 MW of new resources, most of which are natural gas, will help with the resource variability in this subregion. A reduction in the load forecast led to improvement in the number of demand-at-risk hours; however, increasing variability from new resources, coupled with significant retirements of fossil fuel generators, will continue to challenge the subregion. In addition, reliance on imports to be resource adequate will continue to pose a risk to the NWPP-NE subregion.





Electric Reliability and Security for the West

Western Assessment of Resource Adequacy Subregional Results

November 2022

The Western Assessment examines resource adequacy across the Western Interconnection and within each of five subregions:

- California-Mexico (CAMX)
- Desert-Southwest (DSW)
- Northwest Power Pool Northwest Central (NWPP-Central)
- NWPP Northeast (NWPP-NE)
- NWPP Northwest (NWPP-NW)

This part of the report provides information on each of the five subregions, including:

Drivers of Resource Adequacy Challenges in the West

This section describes some of the drivers of resource adequacy challenges in the West and the ways they factor into this assessment.



Demand And Risk Indicator (DRI)

This section provides information on each subregion's Demand at Risk Indicator (DRI). The DRI defines *resource adequacy risk* strictly as the number of hours in a year when demand is at risk, i.e., when the risk for loss of load exceeds the one-day-in-ten-years (ODITY) or 99.98% risk threshold. See the main report for more information on the [DRI](#).

Planning Reserve Margin Indicator (PRMI)

This indicator is a measure of variability on the system. It defines resource adequacy risk by the reserve margin that entities need to account for variability on the system and meet an ODITY, or 99.98%, reliability threshold. See the main report for more information on the [PRMI](#).

Resource Adequacy Risks

This section highlights the frequency, magnitude, and timing of demand-at-risk hours in each subregion. See the [main report](#) for more information.

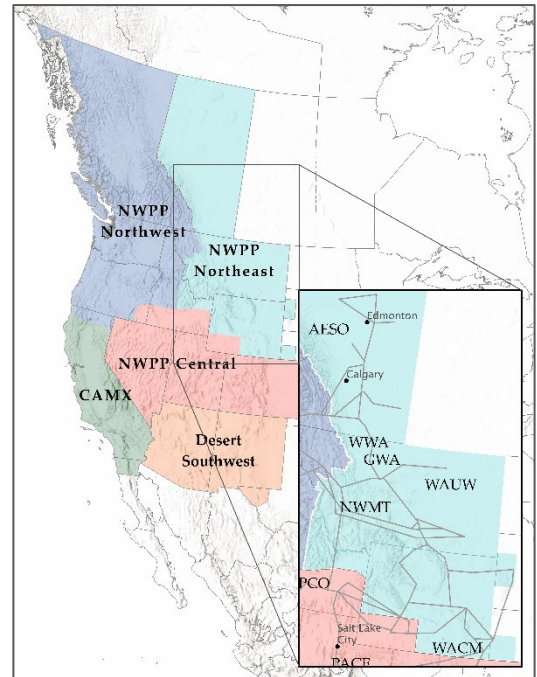
Northwest Power Pool Northeast

This section provides information on the Northwest Power Pool Northeast (NWPP-NE) subregion, which includes Alberta and parts of Idaho, Montana, and Wyoming. This section covers four areas:

- Drivers of resource adequacy challenges in the West;
- Demand at Risk Indicator (DRI);
- Planning Reserve Margin Indicator (PRMI); and
- Resource Adequacy Risks.

Risks to the Subregion

The addition of almost 11,000 MW of new resources, most of which are natural gas, will help with the resource variability in this subregion. A reduction in the load forecast led to improvement in the number of demand-at-risk hours; however, increasing variability from new resources, coupled with significant retirements of fossil fuel generators, will continue to challenge the subregion. In addition, reliance on imports to be resource adequate will continue to pose a risk to the NWPP-NE subregion.



Drivers of Resource Adequacy Challenges

Energy Policy

Montana

[MT House Bill 273](#)—*Nuclear Facility Development (May 2021)*

Eliminates restrictions on nuclear facility development.

[MT Senate Bill 63](#)—*Wind and Solar Development (April 2021)*

Establishes wind and solar development ground lease for state land trusts.

[MT House Bill 387](#)—*Renewable Hydrogen Development (April 2021)*

Revises small energy generation facility requirements and transition costs.

Wyoming

[WY Senate Bill 0152](#)—*Utility Service Connections (July 2021)*

Prohibits cities, towns, and counties from enacting or implementing any law or policy that prevents the connection or reconnection of an electric, natural gas, propane, or other energy utility service provided by a public utility.

Changing Resource Mix

According to current plans, in 2023, while a quarter of the resource mix will be wind and solar, natural gas will make up 42% of the subregion’s resource portfolio. In 2023, the subregion is expected to add 1.6 GW of natural gas resources.

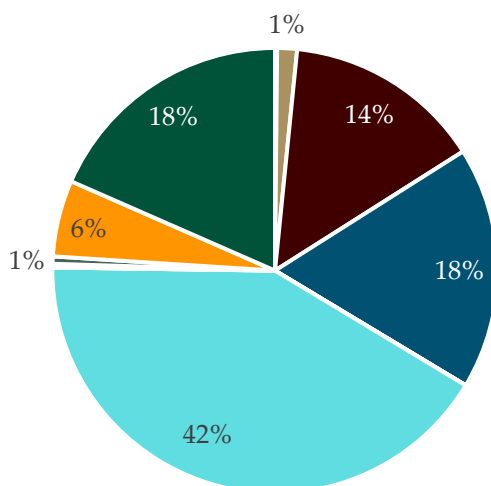


Figure 2: NWPP-NE 2023 Resource Portfolio

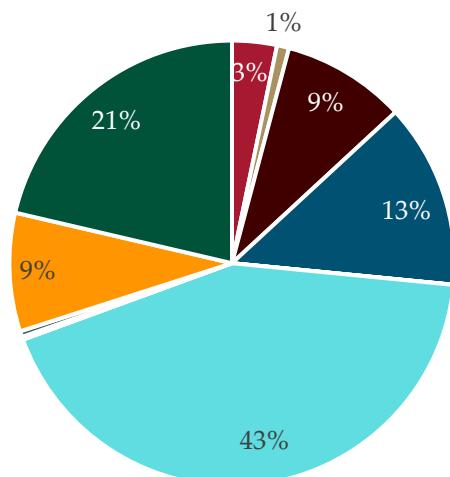


Figure 1: NWPP-NE 2032 Resource Portfolio

■ Battery
 ■ Coal
 ■ Hydro
 ■ Solar
 ■ Wind
 ■ Natural Gas
 ■ Nuclear
 ■ Geothermal
 ■ Biomass
 ■ Petroleum
 ■ Other

Northwest Power Pool Northeast

Over the next 10 years, entities plan to build 11 GW of new resources. Most of the new resources are expected to be online in the next four years and consist mainly of natural gas with some solar, wind, and battery storage. By 2032, 43% of the resource portfolio will be natural gas, and over one-third of the resource portfolio will be solar, wind, and battery storage.

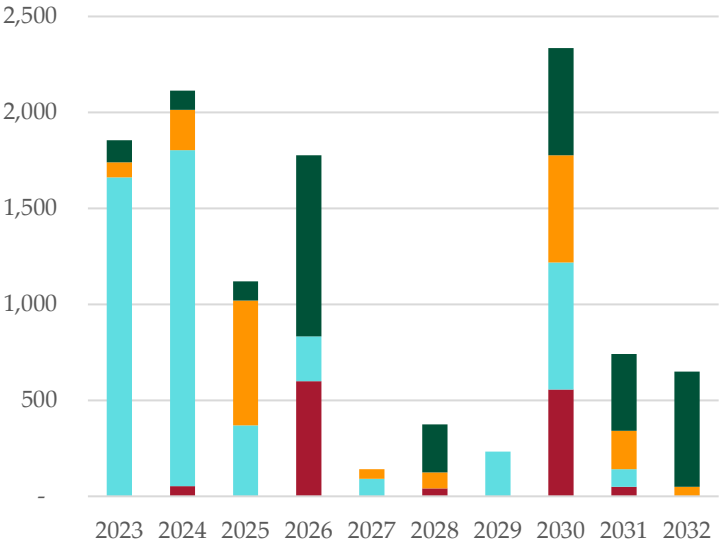


Figure 3: NWPP-NE Planned Resources 2023-2032 (MW)

Over the next 10 years, the NWPP-Northeast subregion is expected to retire 1.4 GW of resources. Most of this will be coal resources (1 GW).

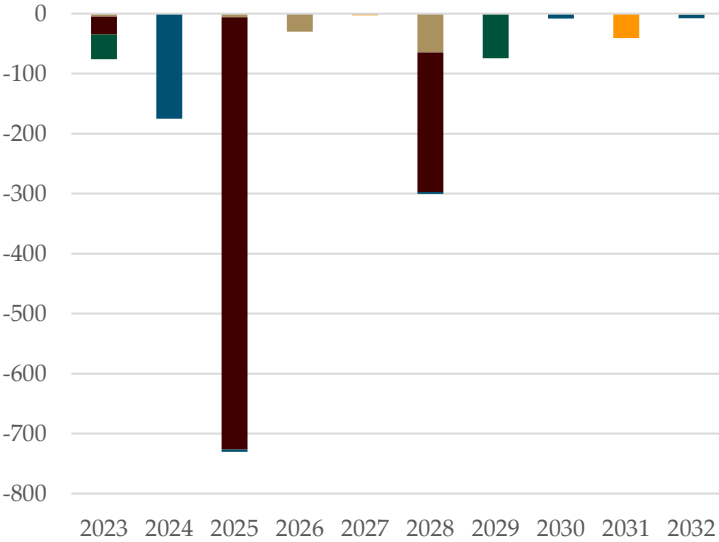


Figure 4: NWPP-NE Planned Retirements 2023-2032 (MW)

■ Battery
 ■ Coal
 ■ Hydro
 ■ Solar
 ■ Wind
 ■ Natural Gas
 ■ Nuclear
 ■ Geothermal
 ■ Biomass
 ■ Petroleum
 ■ Other



Changing Load and Demand

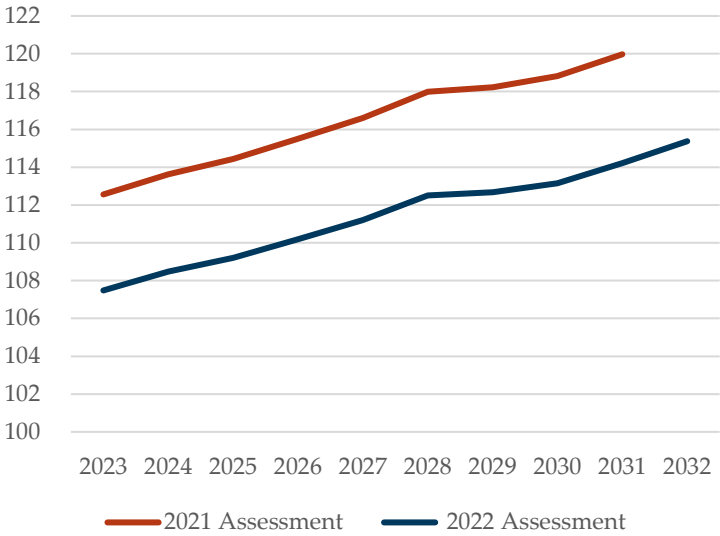


Figure 5: NWPP-NE Annual Energy Demand 2023-2032 (TWh)

Between 2023 and 2032, the total energy demand in the NWPP-NE subregion is expected to grow by 7.3%. This is equal to the rate of growth seen in the 2021 assessment. However, the total demand is about 5% lower than what was seen in last year's assessment. This is due to adjustments that entities in the subregion made to their demand forecasts to reflect new economic and power use realities in the pandemic- and economic-recovery phase. The adjustments account for a shift from commercial consumption to residential consumption, aggressive conservation and efficiency standards, and economic recession.

Except for 2023 and 2024, the NE subregion is predicting higher demand peaks than last year's assessment. Overall, the total and peak demand progressions did not grow as fast in the Northeast region as the other subregions, at a 6.2% rate between 2023 and 2032.

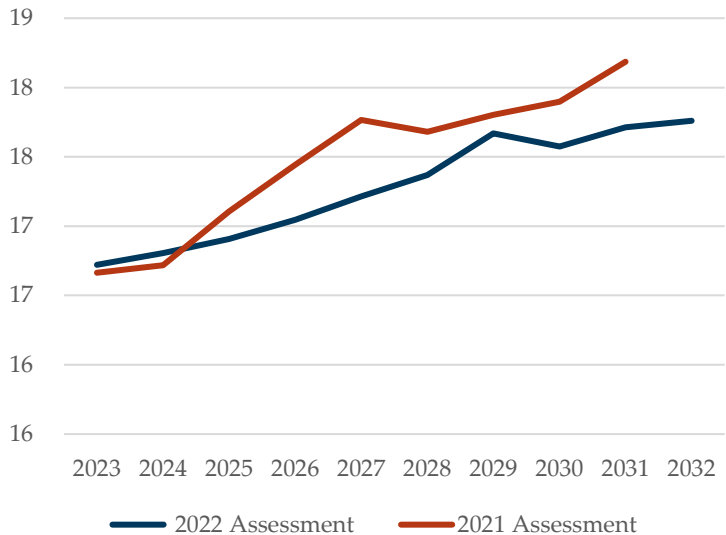


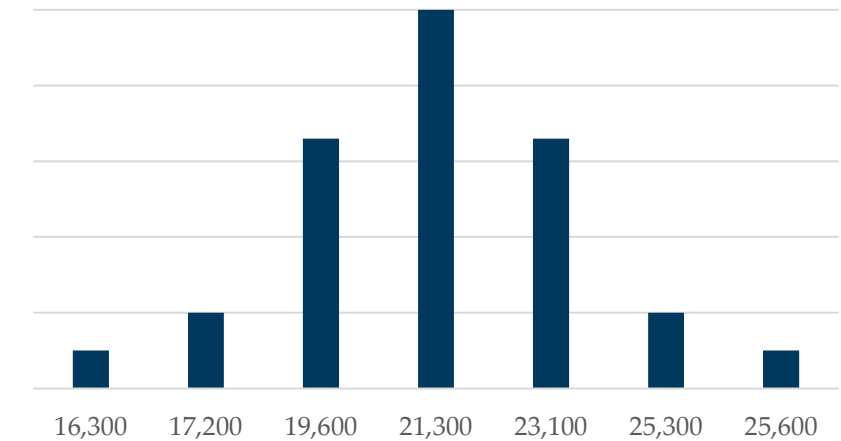
Figure 6: NWPP-NE Peak Demand 2023-2032 (GW)



Resource Variability

Balancing Authorities in the NWPP-NE subregion provided WECC with expected demand and resource numbers. Because demand and resources rarely occur as expected, WECC looks at the variability of both using a statistical range of resource availability and demand possibilities.

On the peak hour of demand in 2023, the resource availability for the NWPP-NE subregion could deviate from expectations by as much as 5 GW. This is driven by wind (2 GW) and hydro variability (1.3 GW).



	1-in-20	1-in-10	1-in-3	1-in-2	1-in-3	1-in-10	1-in-20
Baseload	14,600	14,900	16,100	16,300	16,500	16,800	16,900
Hydro	1,700	2,200	2,500	3,000	3,600	4,000	4,000
Solar	-	-	-	-	-	-	-
Wind	-	100	1,000	2,000	3,000	4,500	4,700

Figure 7: NWPP-NE Peak Hour Resource Variability 2023 (MW)

On the demand side, in 2023, there is a one-in-33-year chance that that peak demand in the subregion could be as much at 17.7 GW, almost a 6% increase over the expected peak demand of 16.7 GW. Under extreme conditions that affect both demand and resource availability, the system may need to import a great deal of power to remain resource adequate. If that power is not available for import, the subregion could be at risk for load loss.

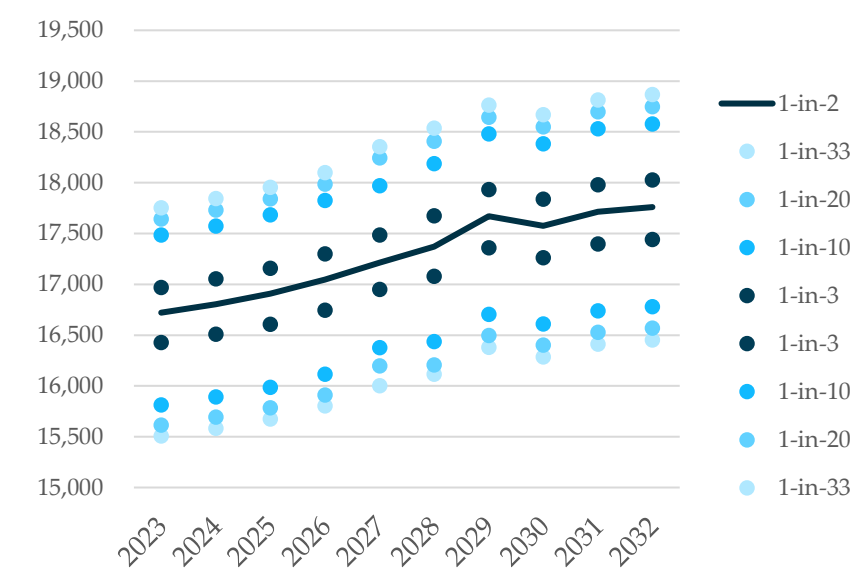


Figure 8: NWPP-NE Peak Demand Variability 2023-2032 (MW)



Demand at Risk Indicator

WECC uses a measure called the *Demand at Risk Indicator* to measure and track the number of hours in a year when demand is at risk, assuming all planned resources are built and imports are available.

The DRI for the NWPP-NE subregion has greatly improved over last year's assessment, though it is still expected to grow over the next decade. The reduction in the DRI compared to last year's assessment is due to the changes in the demand forecast noted above.

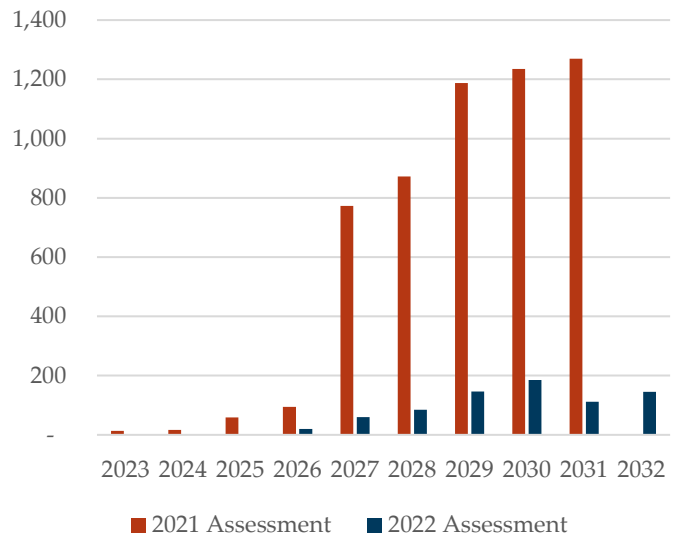


Figure 9: NWPP-NE DRI 2023-2032 (No. of Hours)

Planning Reserve Margin Indicator

WECC uses a measure called the *Planning Reserve Margin Indicator* to measure and track variability on the system under different Planning Reserve Margin scenarios.

Given a planning reserve margin that is determined based on the peak demand hour, the NWPP-NE subregion has 968 demand-at-risk hours in 2023, assuming no imports from other subregions. The point at which the hours at risk fall below the one-day-in-ten-year threshold ($PRMI_{ODITY}$) is 19.1%. This means that there are 968 non-peak hours when the variability is greater than the peak demand hour.

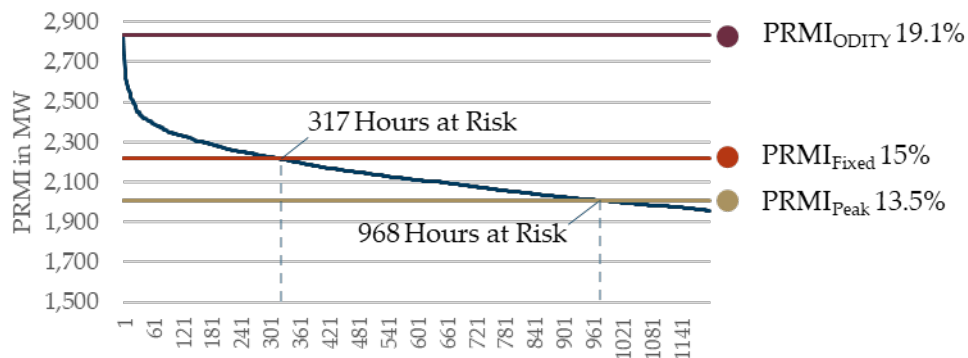
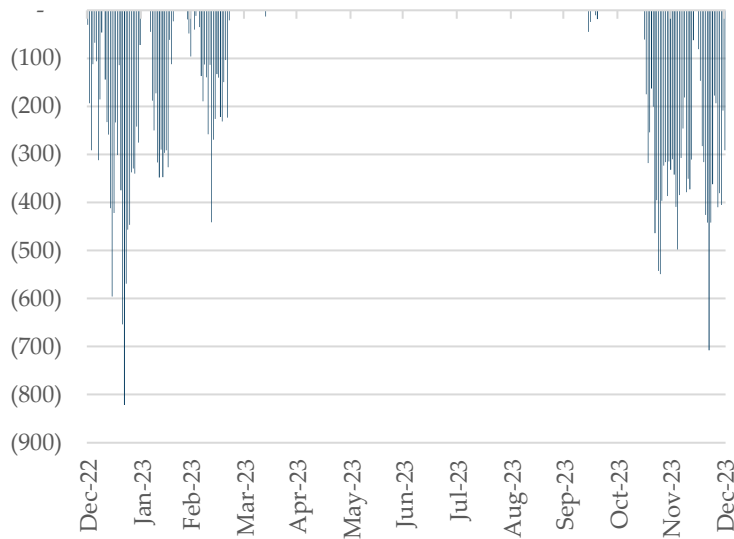


Figure 10: NWPP-NE PRMI 2023



Resource Adequacy Risk Outlook



With the planning reserve margin of 13.5%—determined based on the peak hour—the demand-at-risk hours occur largely in the spring and winter months.

Figure 11: NWPP-NE Demand-at-Risk Hours Magnitude and Timing with $PRMI_{Peak}$ for 2023 (MW)

With a planning reserve margin of 15%, most demand-at-risk hours occur in the winter months. However, there are still some demand-at-risk hours in the spring and late fall.

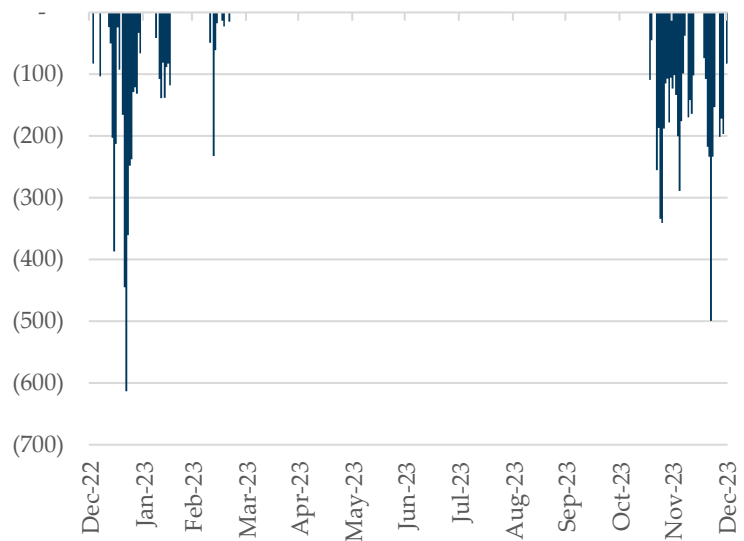


Figure 12: NWPP-NE Demand-at-Risk Hours Magnitude and Timing with $PRMI_{Fixed}$ for 2023 (MW)

Northwest Power Pool Northeast

The PRMI_{ODITY} for the NWPP-NE subregion is expected to be around 19.1% for 2023. This is an increase from last year's assessment. As new resources and demand growth continue, the PRMI_{ODITY} increases to 23.4% in 2032. The growth pattern and rate are similar to what was seen in the 2021 assessment.

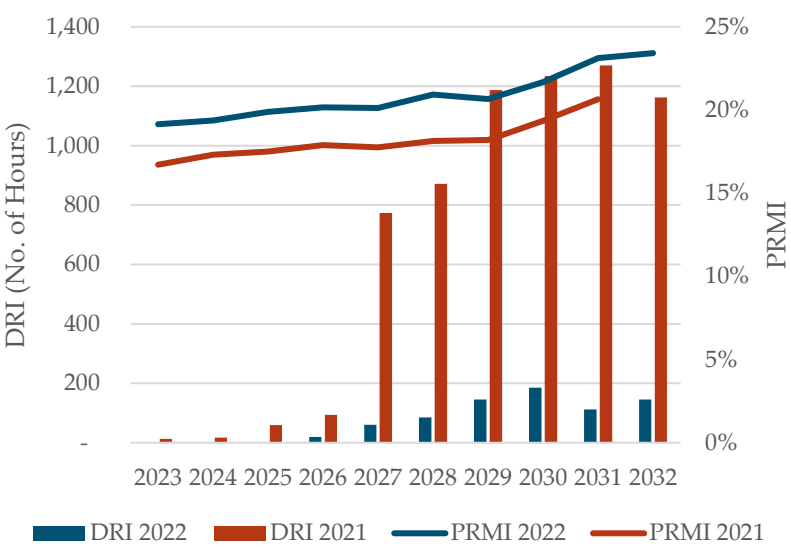


Figure 13: Comparison of NWPP-NE DRI and PRMI_{ODITY} 2023-2032

