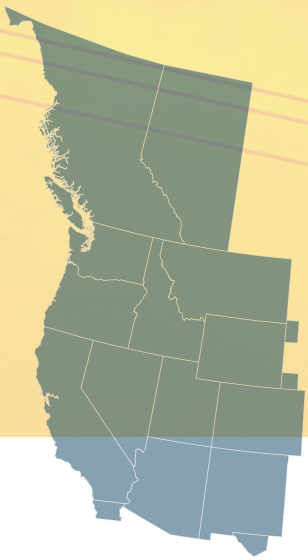
WESTERN ASSESSMENT
of Resource Adequacy

Northwest Power Pool Central (NWPP-C)

This section provides information on the Northwest Power Pool Central (NWPP-C) subregion, which includes all of Utah and Colorado, most of Nevada, and parts of Idaho and Wyoming.

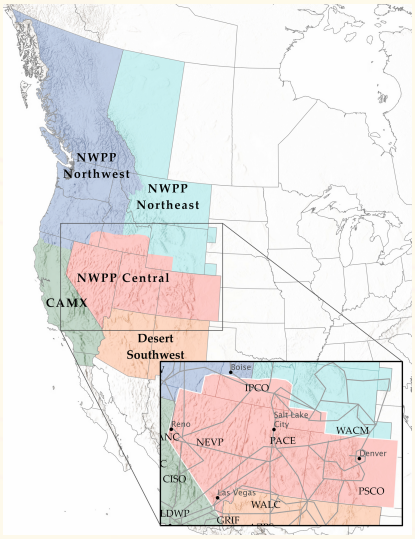
According to plans, this subregion will retire 11 GW of resources and build 19 GW of resources in the next 10 years. The demand-at-risk hours increase every year for the next 10 years. This is more than any other subregion.

Variability in the subregion increases in the near-term, when the majority of new variable energy resources are planned, but levels off in 2028 as new nuclear and battery resources become operational.



SUB-REGIONAL RISKS

The addition of almost 19,000 MW of new resources, most of which are solar, will add resource variability and, therefore, risk to the subregion over the next decade. Because it sits between the dual- and winter-peaking northern subregions and summer-peaking southern subregions, the NWPP-Central subregion shows demand-at-risk hours throughout a larger part of the year. Increasing load, resource variability, and drivers that change demand, like electrification, will continue to challenge the subregion.



WECC

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.

WECC

Electric Reliability and Security for the West

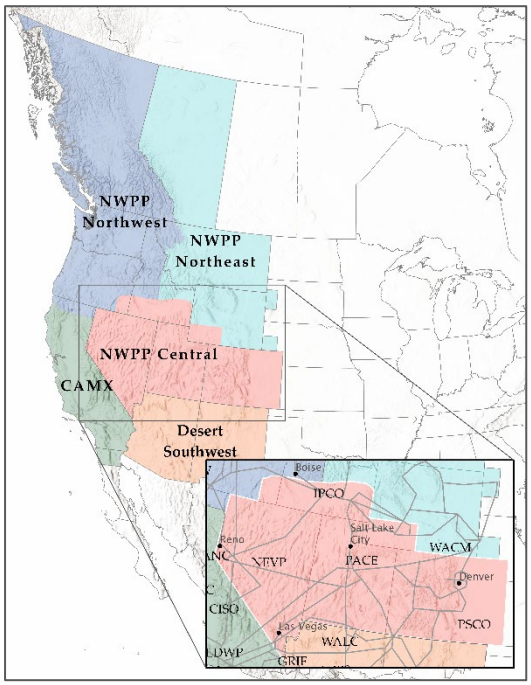
Western Assessment of Resource Adequacy—Northwest Power Pool Central

November 2022

Northwest Power Pool Central

This section provides information on the Northwest Power Pool Central (NWPP-C) subregion, which includes all of Utah and Colorado, most of Nevada, and parts of Idaho 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 19,000 MW of new resources, most of which are solar, will add resource variability and, therefore, risk to the subregion over the next decade. Because it sits between the dual- and winter-peaking northern subregions and summer-peaking southern subregions, the NWPP-Central subregion shows demand-at-risk hours throughout a larger part of the year. Increasing load, resource variability, and drivers that change demand, like electrification, will continue to challenge the subregion.

Drivers of Resource Adequacy Challenges

Energy Policy

Colorado

CO House Bill 1238—Public Utilities Commission Modernize Gas Utility Demand-side Management Standards (June 2021)

Modernization of gas energy efficiency programs.

CO Senate Bill 246—Electric Utility Promote Beneficial Electrification (June 2021)

Measures to encourage beneficial electrification and direct public utility commission and Colorado utilities to promote compliance with current environmental and labor standards.

CO Senate Bill 21-072—*Public Utilities Commission Modernize Electric Transmission (June 2021)*

Creates an independent Colorado electric transmission authority to establish intrastate electric transmission corridors and to operate transmission and storage facilities. It also requires transmission utilities to join a Regional Transmission Organization (RTO) to increase coordination.

Utah

UT House Bill 0244—*Geological Carbon Sequestration Amendments (March 2022)*

Authorizes the Division of Oil, Gas, and Mining and the Board of Oil, Gas, and Mining to establish regulations for the geologic storage of carbon.

Nevada

NV Senate Bill 448—*Clean Energy Bill*

Requires all utility providers to join an RTO by 2030. In addition, it requires an 80% reduction in CO_2 emissions from 2005 levels by 2030.

Changing Resource Mix

According to current plans, in 2023, solar, wind, and battery storage will make up 36% of the NWPP-Central subregion's resource portfolio due to the addition of 3.8 GW of solar and 1 GW of battery storage.

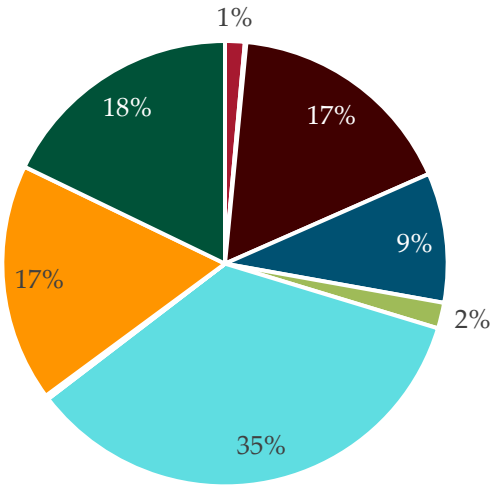


Figure 2: NWPP-Central 2023 Resource Portfolio

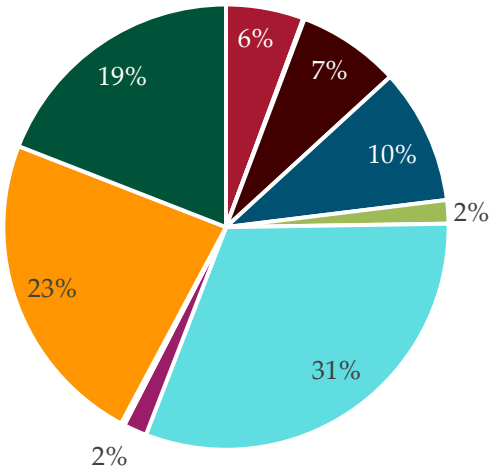


Figure 1: NWPP-Central 2032 Resource Portfolio

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

Over the next 10 years, entities plan to build almost 19 GW of new resources. Most new resources are expected to be online in the next four years (14GW). By 2032, nearly half of the subregion's portfolio will be solar, wind, and battery storage.

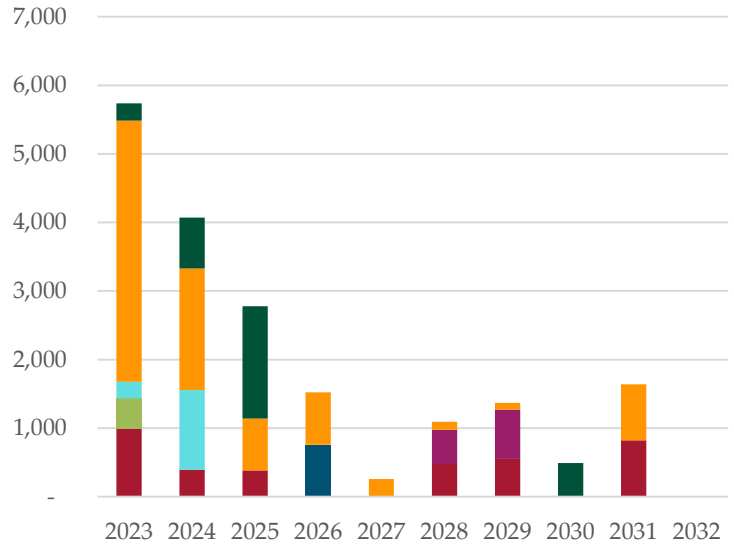


Figure 3: NWPP-Central Planned Resources 2023-2032 (MW)

Over the next 10 years, the NWPP-Central subregion is expected to retire over 11 GW of resources. Over half of this will be coal resources (6 GW), with an additional 3 GW of natural gas resources and more than 1.5 GW of wind resources.

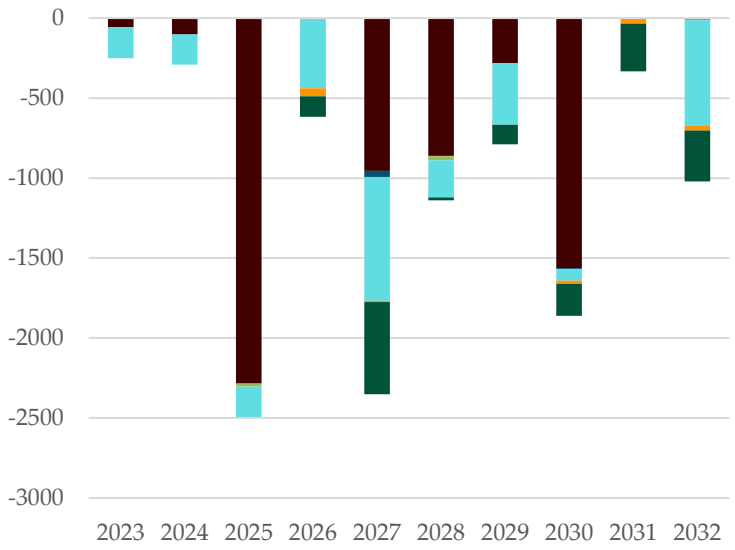
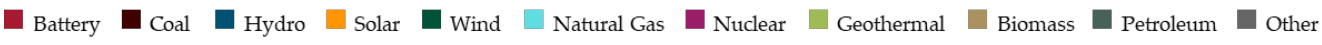


Figure 4: NWPP-Central Planned Retirements 2023-2032 (MW)



Changing Load and Demand

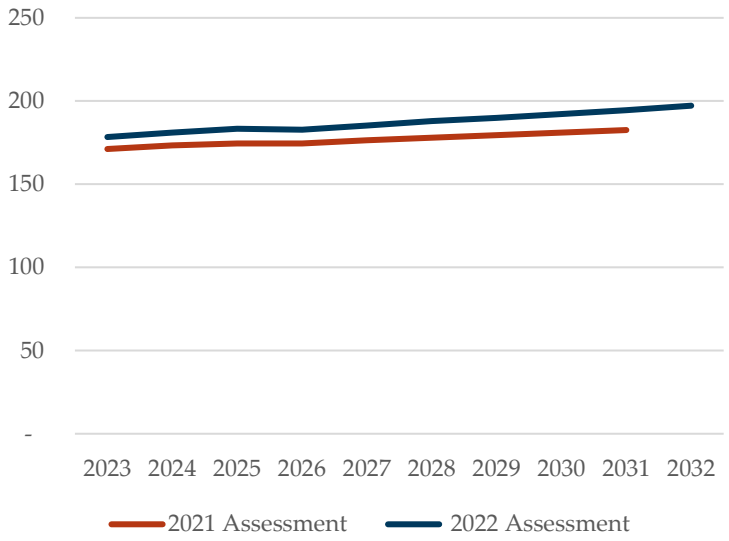


Figure 5: NWPP-Central Annual Energy Demand 2023-2032 (TWh)

Between 2023 and 2032, the total energy demand in the NWPP-Central subregion is expected to grow by 9%. This growth is greater than the rate seen in last year's assessment, which had a projected growth rate of 6%.

The NWPP-Central subregion's peak demand hour occurs in the summer. It is expected to grow from about 39.8 GW in 2023 to 43.6 GW in 2032, a 9.5% increase, which is around the same growth rate seen in last year's assessment.

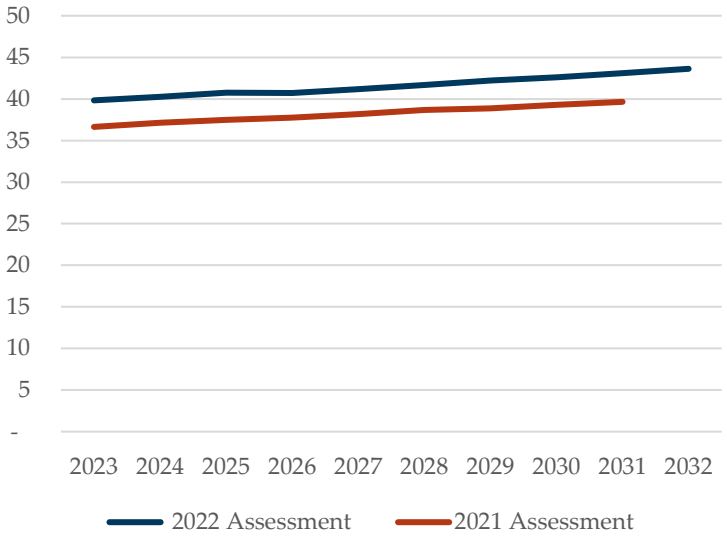
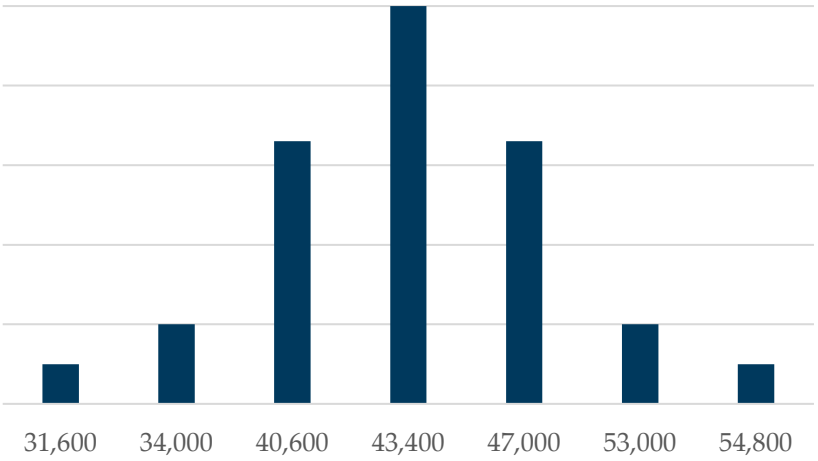


Figure 6: NWPP-Central Peak Demand 2023-2032 (GW)

Resource Variability

Balancing Authorities in the NWPP-Central 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.



	1-in-20	1-in-10	1-in-3	1-in-2	1-in-3	1-in-10	1-in-20
Baseload	24,900	26,100	28,800	29,700	30,900	32,100	32,400
Hydro	2,600	3,000	3,900	4,500	5,100	5,700	5,900
Solar	3,900	4,400	6,500	6,800	7,200	7,800	8,100
Wind	200	500	1,400	2,400	3,800	7,400	8,400

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

On the peak demand hour in 2023, the resource variability in the NWPP-Central subregion may deviate from the expected value by as much as 11 GW. The peak demand hour occurs in the mid-afternoon, allowing the subregion to rely more heavily on solar resources to cover its peak demand than other subregions.

On the demand side, in 2023, there is a one-in-33-year chance that peak demand in the subregion could exceed 43 GW, an 18% increase over the expected peak of 36.9 GW. Under extreme conditions that affect demand and resource availability, like a heat wave event, the system may need to import power to remain resource adequate. If that power is unavailable, the subregion could risk load loss.

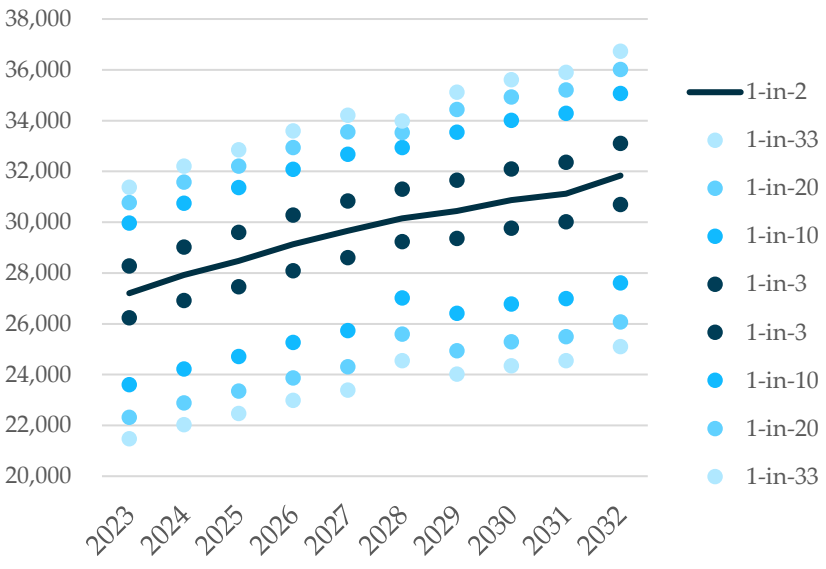


Figure 8: NWPP-Central Peak Demand Variability 2023-2032 (MW)

Demand at Risk Indicator

WECC uses 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-Central subregion improved over last year's assessment, but it will grow each year over the next decade.

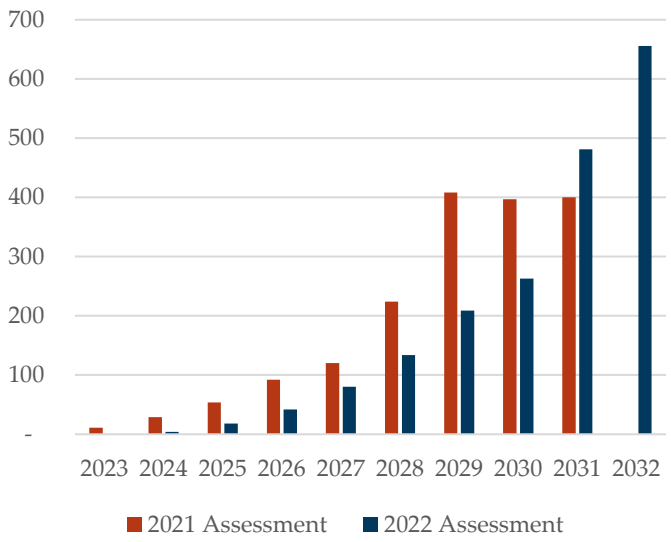


Figure 9: NWPP-Central DRI 2023-2032 (No. of Hours)

Planning Reserve Margin Indicator

WECC uses 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-Central subregion has 1,918 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 18.9%. This means that there are 1,918 non-peak hours when the variability is greater than on the peak demand hour.

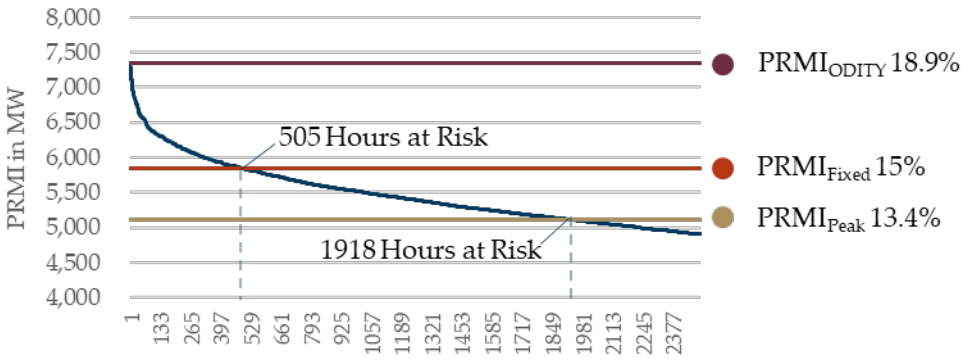


Figure 10: NWPP-Central PRMI 2023

Resource Adequacy Risks

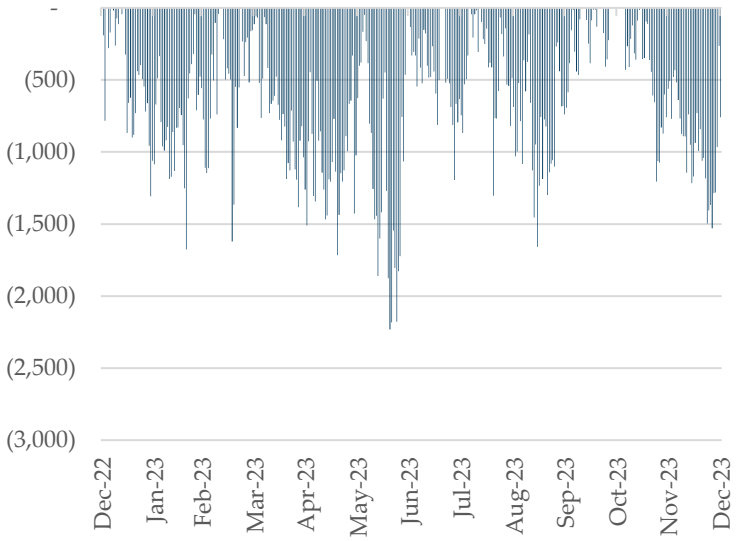


Figure 11: NWPP-Central Demand-at-Risk Hours Magnitude and Timing with $PRMI_{Peak}$ for 2023 (MW)

With a planning reserve margin of 13.4, based on the peak demand hour, the demand-at-risk hours spread throughout the entire year.

A planning reserve margin fixed at 15% reduces the number of hours and the magnitude of demand at risk during those hours, but the risk still spreads throughout the year.

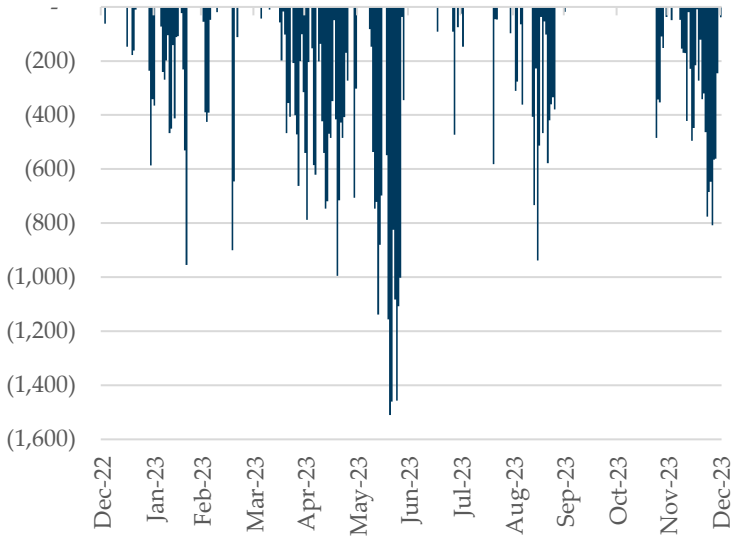


Figure 12: NWPP-Central Demand-at-Risk Hours Magnitude and Timing with $PRMI_{Fixed}$ for 2023 (MW)

The PRMIODITY for the NWPP-Central subregion is expected to be around 19.3% for 2023. This rate is slightly higher than last year's assessment. As new resources and demand growth continues, the PRMI increases slightly, reaching 23.2% in 2032. In later years, the DRI increases, but the PRMI remains relatively unchanged. This is because, unlike other subregions that are expected to add many variable resources, a large portion of the planned resources in the NWPP-Central subregion from 2028 to 2032 are battery storage and nuclear. These resources are not variable resources and do not increase the variability on the system by much; therefore, the PRMI does not increase much.

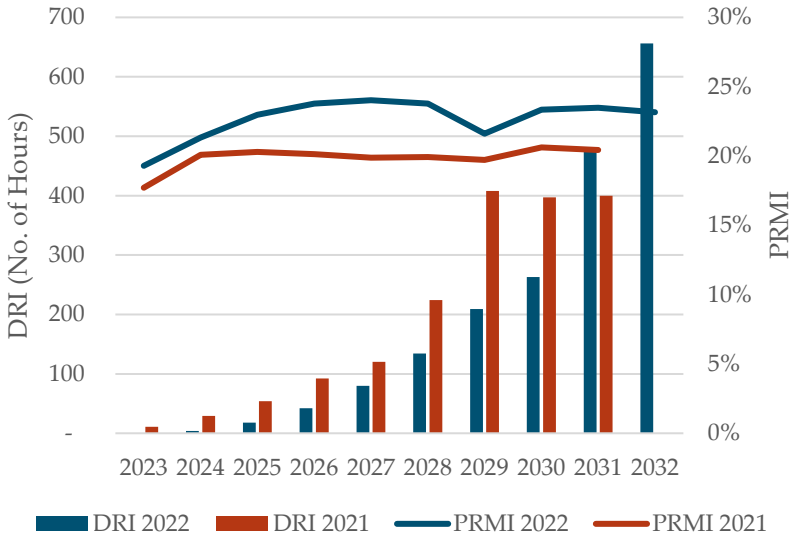


Figure 13: Comparison of NWPP-Central DRI and PRMIODITY 2023-2032