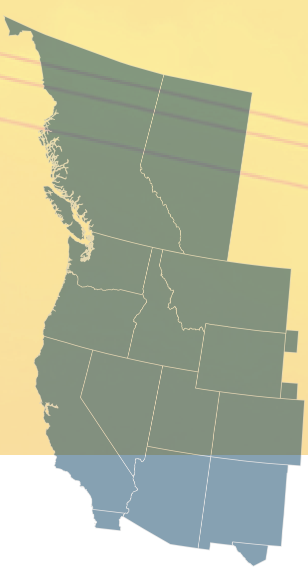
WESTERN ASSESSMENT
of Resource Adequacy

Desert-Southwest (DSW)

This section provides information on the Desert-Southwest (DSW) subregion, which includes all of Arizona, most of New Mexico, and parts of Texas and California (Imperial Irrigation District).

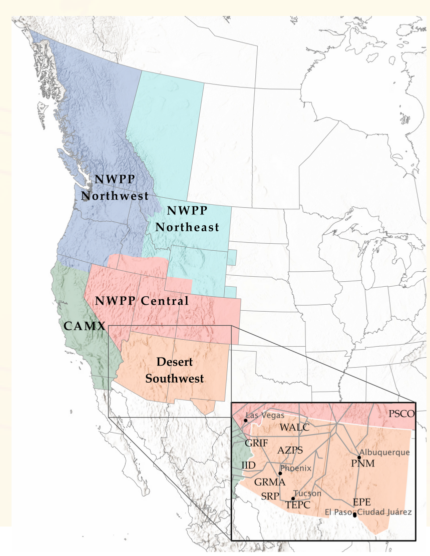
Demand-at-risk hours increase over the next seven years. Then, in 2031, the demand-at-risk hours start to decrease due to new resources in this subregion and throughout the interconnection. The decrease in demand-at-risk hours in this assessment is largely dependent on an increase in energy imported into the subregion.

Variability increases over the next decade, even during times when the demand-at-risk hours decrease. The increased variability is due to the retirement of 4 GW of coal and close to 10 GW of new solar, wind, and battery storage resources.
By 2032, over a third of the subregion's resource portfolio will be made up of these variable energy resources.



SUB-REGIONAL RISKS

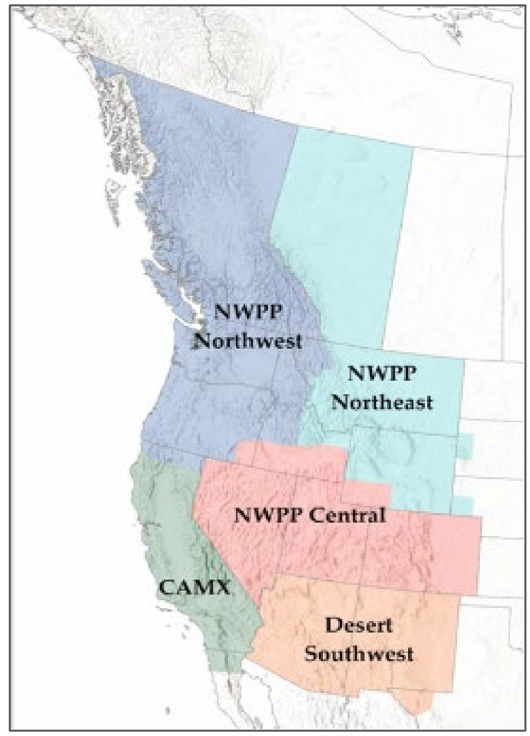
The addition of almost 11,000 MW of new resources, most of which are solar, will add to the resource variability in the DSW subregion. However, this subregion shows less variability than the other subregions, largely due to a fairly consistent climate. Results of this assessment show this subregion will need to rely on imports to remain resource adequate, and this reliance grows over the next decade. Those imports may not be available as expected during wide-spread extreme events, putting load at risk.



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.

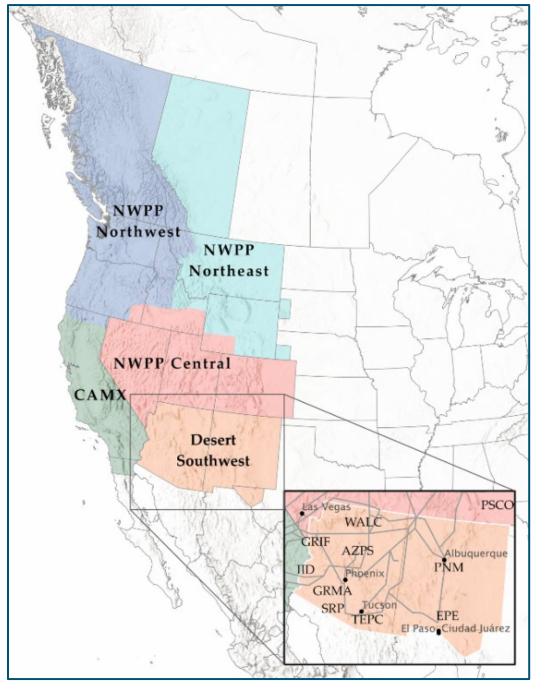
Resource Adequacy Risks

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

Desert-Southwest Subregion

This section provides information on the Desert-Southwest (DSW) subregion, which includes all of Arizona, most of New Mexico, and parts of Texas and California (Imperial Irrigation District). 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 solar, will add to the resource variability in the DSW subregion. However, this subregion shows less variability than the other subregions, largely due to its fairly consistent climate. Results show this subregion will need to rely on imports to remain resource adequate, and this reliance grows over the next decade. Those imports may not be available as expected during wide-spread extreme events, putting load at risk. The subregion has vast solar resources that can be used to meet its peak, which occurs during the day in the summer.

Drivers of Resource Adequacy Challenges

Energy Policy

Arizona

AZ House Bill 2411—Coal Combustion Regulation (April 2022)

Authorizes the Arizona Department of Environmental Quality (ADEQ) to establish and operate a program to regulate the disposal of coal combustion residuals (CCR).

[AZ House Bill 2153](#)—Renewable Energy Storage (July 2021)

Invests resources into renewable energy storage equipment.

New Mexico

[NM House Bill 4](#)—Hydrogen Development (January 2022)

Authorizes development of Hydrogen Development Hub program.

Changing Resource Mix

According to current plans, about a quarter of the 2023 DSW subregion's resource portfolio will be solar, wind, and battery storage due to the addition of 2.6 GW of solar, 1 GW of battery storage, and 400 MW of wind.

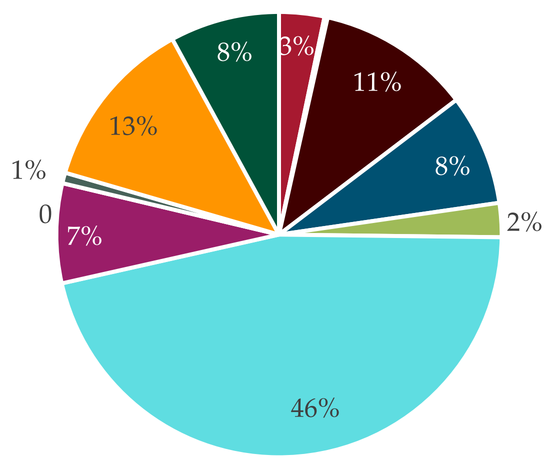


Figure 2: DSW 2023 Resource Portfolio

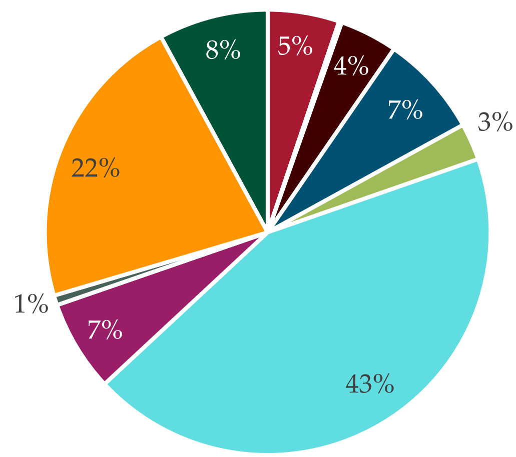


Figure 1: DSW 2032 Resource Portfolio

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

Over the next 10 years, entities plan to build 11 GW of new resources. By 2032, 35% of the DSW subregion's resource portfolio will be solar, wind, and battery storage.

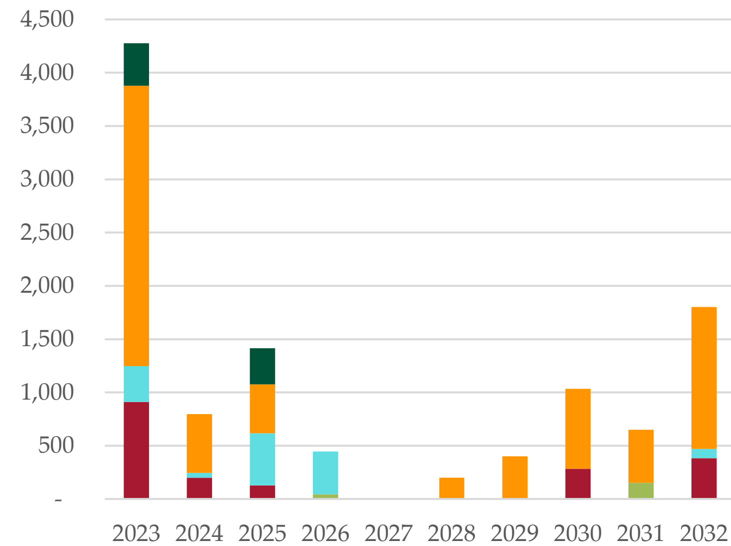


Figure 3: DSW Planned Resources 2023-2032 (MW)

Over the next 10 years, the DSW subregion is expected to retire more than 5 GW of resources. Most of this will be coal (4 GW). The majority of the retirements are planned in later years.

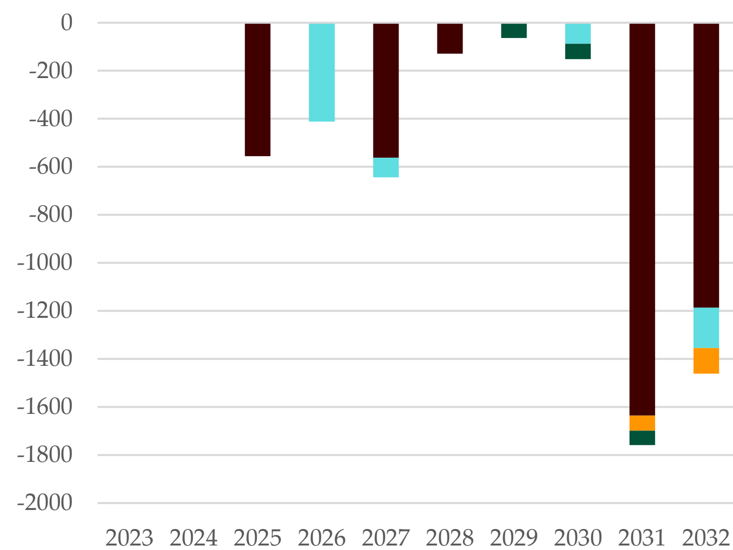
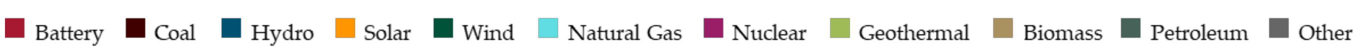


Figure 4: DSW Planned Retirements 2023-2032 (MW)



Changing Load and Demand

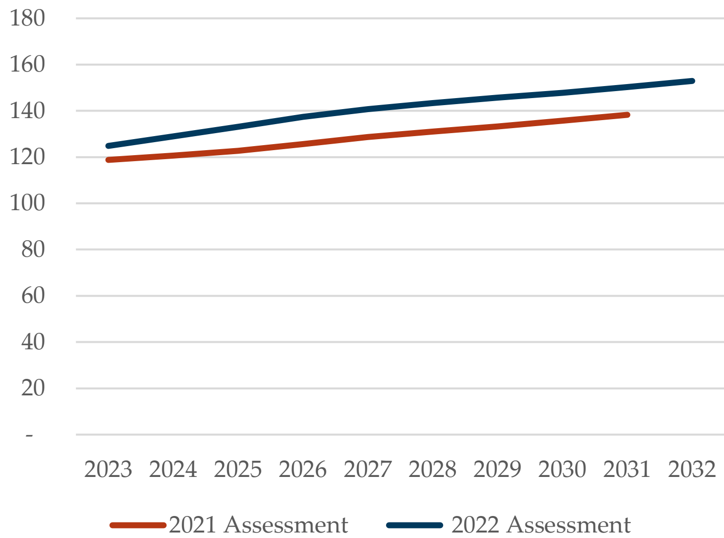


Figure 5: DSW Annual Energy Demand 2023-2032 (TWh)

Between 2023 and 2032, the total energy demand in the DSW subregion is expected to grow by 20%. This is greater than the growth rate seen in last year's assessment, which contained a projected rate of growth of 16% for the same period.

The DSW subregion's peak demand hour occurs in the summer. It is expected to grow from about 27.2 GW in 2023 to 31.8 GW in 2032, nearly a 17% increase. The rate of growth is similar to the growth rate seen in last year's assessment.

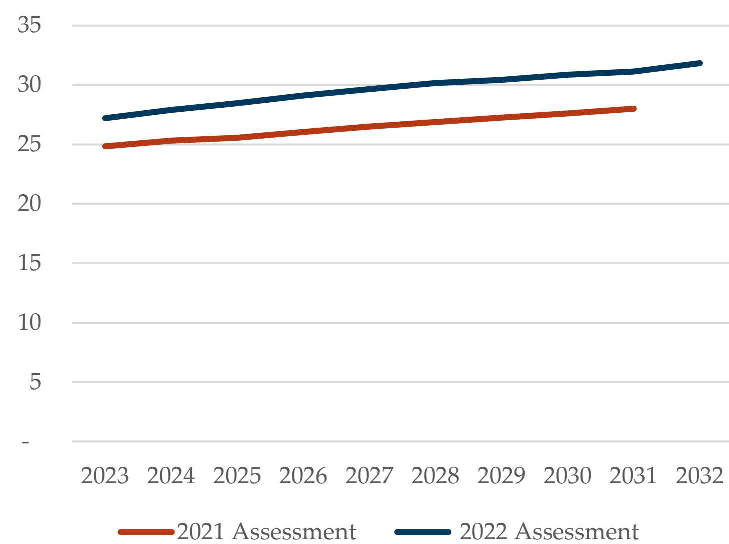
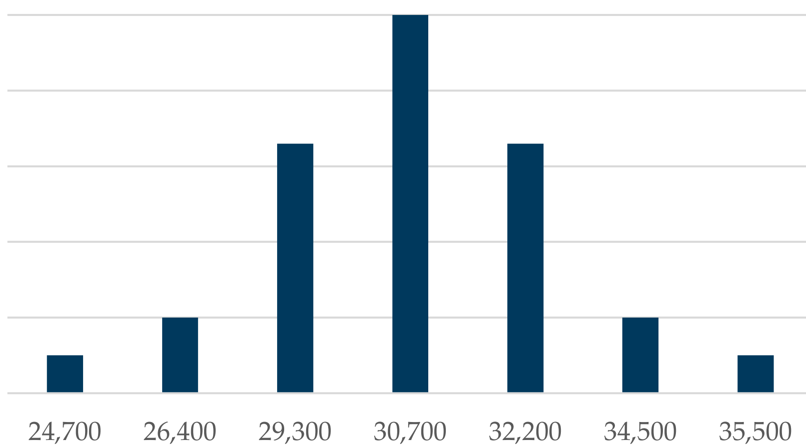


Figure 6: DSW Peak Demand 2023-2032 (GW)

Resource Variability

Balancing Authorities in the DSW 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 demand hour in 2023, the resource availability in the DSW subregion may deviate from expectations by as much as 6 GW. The peak hour for the DSW subregion occurs during the day in the summer. This allows the subregion to rely more on solar power to cover its peak demand than other regions.



	1-in-20	1-in-10	1-in-3	1-in-2	1-in-3	1-in-10	1-in-20
Baseload	21,300	22,100	23,800	24,400	25,100	26,100	26,400
Hydro	1,700	2,000	2,400	2,800	3,000	3,200	3,600
Solar	1,600	2,100	2,700	2,900	3,200	3,700	3,900
Wind	100	200	400	600	900	1,500	1,600

Figure 7: DSW Peak Hour Resource Variability 2023 (MW)

On the demand side, in 2023, there is a one-in-33-year chance that peak demand in the subregion could exceed 31 GW, a 15% increase over the expected peak demand of 27.2. Under extreme conditions that affect both demand and resource availability—such as a heat wave event—the system may need to import power to remain resource adequate. If that power is not available to import, the subregion could be at risk for load loss.

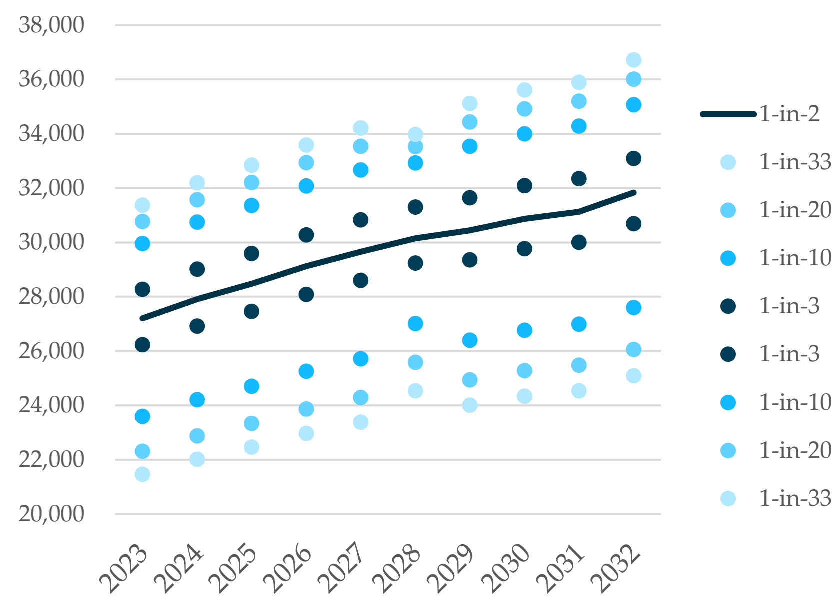


Figure 8: DSW Peak Demand Variability 2023-2032 (MW)

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 DSW subregion improved over last year's assessment in the near-term (2023–2025), but it grows until 2031. In 2031 and 2032, with new resources being added throughout the interconnection, the results show the DSW subregion will need a large growth in imports to reduce the DRI. Based on the results, that imports will go from 280 GW in 2030 to 1,133 GW in 2032 and still will not be enough to mitigate all hours of demand at risk.

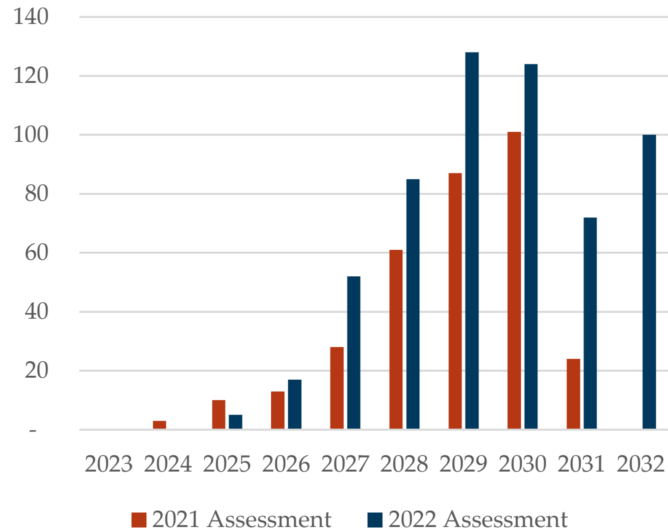


Figure 9: DSW DRI 2023-2032 (No. of Hours)

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 DSW subregion has 178 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 15.8%. This means that there are 178 non-peak hours when the variability, and risk, is greater than on the peak demand hour.

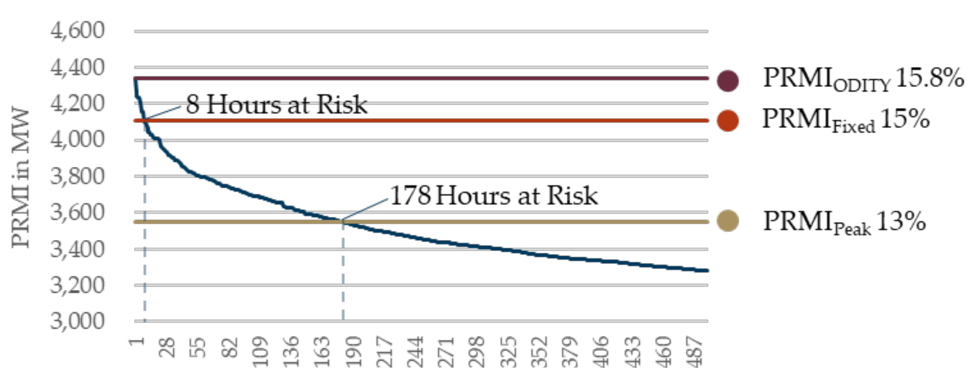


Figure 10: DSW PRMI 2023

Resource Adequacy Risks

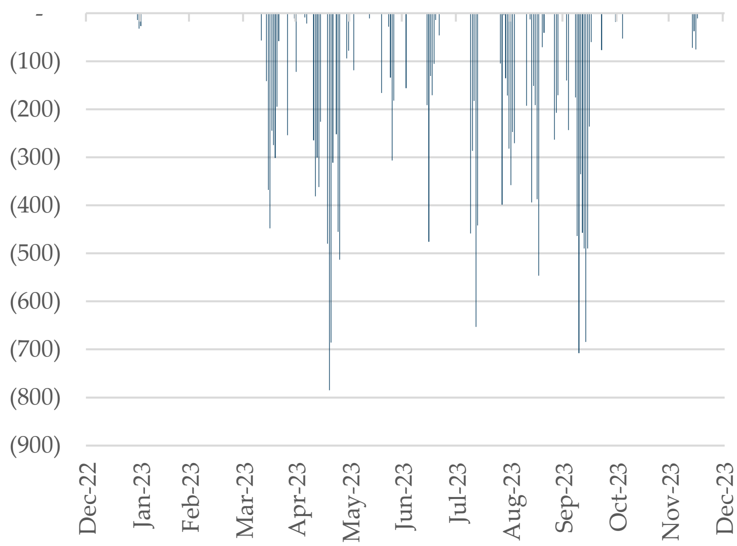


Figure 11: DSW Demand-at-Risk Hours Magnitude and Timing with $PRMI_{Peak}$ for 2023 (MW)

With a planning reserve margin of 13%, determined based on the peak hour, the demand-at-risk hours are spread from April to November in 2023.

With a PRM of 15%, there are fewer hours at risk, and they are concentrated largely in the shoulder months in late spring and fall.

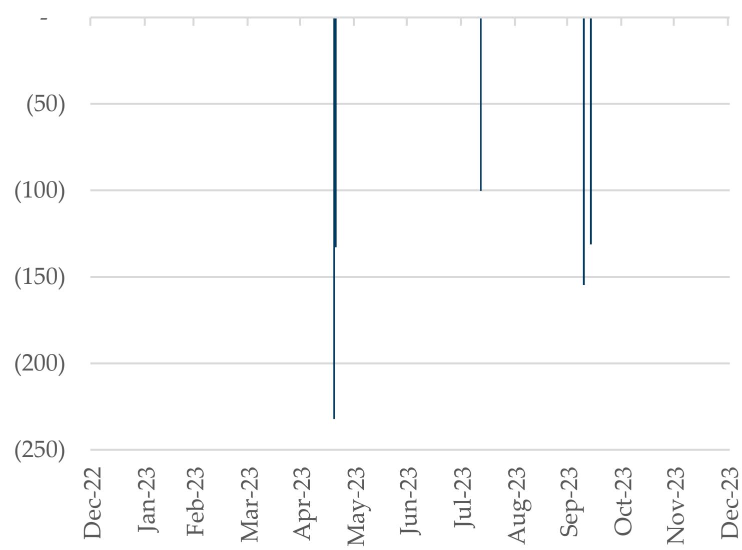


Figure 12: DSW Demand-at-Risk Hours Magnitude and Timing with $PRMI_{Fixed}$ for 2023 (MW)

The PRMIODITY for the DSW subregion is expected to be around 16.8% for 2023. This is slightly lower than last year's assessment. As new resources and demand growth continues, the PRMI increases slightly over the next 10 years, 19.9% by 2032. In 2031 and 2032, when there is a decrease in the DRI, the PRMI continues to increase. This is because, while the demand-at-risk hours decrease due to the addition of resources added in these years, the level of reserves necessary to manage variability increases because the new resources are variable.

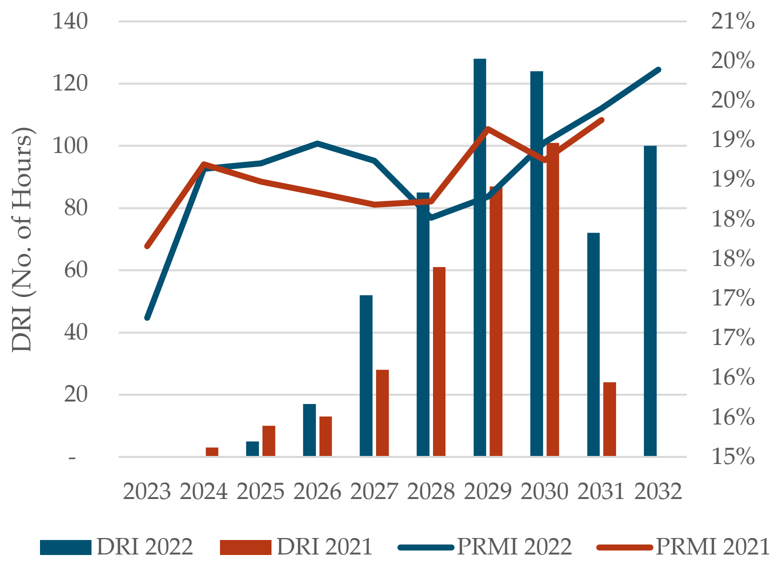


Figure 13: Comparison of DSW DRI and PRMIODITY 2023-2032