Puget Sound Energy

2024 Natural Gas Hedging Plan and 2023 Purchased Gas Adjustment Retrospective

September 2024

Shaded information is designated as confidential per WAC 480-07-160

TABLE OF CONTENTS

1 | Objectives and Goals

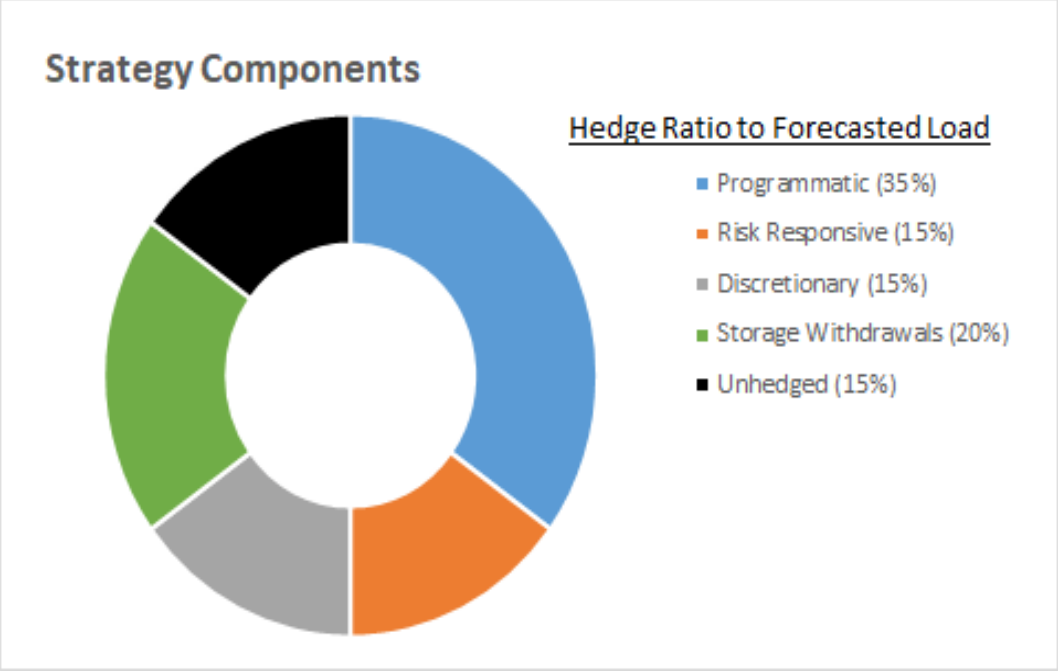
The goal of Puget Sound Energy's ("PSE") natural gas local distribution company ("LDC") hedging plan ("Program") is to balance the benefit of price stability for our customers with the cost of hedging. The primary measurable objectives of the Program relate to how much of PSE's demand to hedge and incorporating strategies to respond to a dynamic natural gas market.

One of the biggest challenges in designing a hedging program for an LDC is determining an appropriate hedging volume. Demand forecasts are reasonably accurate under normal weather conditions, but during abnormal weather conditions, an LDC's demand can vary substantially from forecasts.

PSE's hedges are entered into based on long-term load forecasts, which by their nature cannot account for short-term weather abnormalities. PSE can reasonably predict its minimum load with a high level of confidence based on historical weather data. PSE attempts to avoid over-hedging to actual load as this can result in large hedging losses due to prices typically trending lower when system demand is below plan. Given these considerations, PSE's program is designed with enough hedging capacity to match the high-confidence, minimum-load forecast ("low-load forecast"). This approach calls for a hedge ratio of up to 85% of normal load,[1] which provides effective price-risk management while mitigating the costs associated with hedging.

PSE's natural gas hedging program includes a combination of programmatic, risk-responsive, and discretionary protocols along with utilization of its storage assets. The result is a program with diversified strategies that provide both the stability of ratable risk reduction and the flexibility to respond to changes in market prices and volatility. **Figure 1** illustrates the strategy components of PSE's hedging plan.

Figure 1 Hedging Plan Strategy Components



[1] Typically, PSE does not hedge to the full 85% capacity unless risk-responsive and discretionary protocols—described later in this document—are fully transacted.

The low-load forecast reflects the same demand conditions and forecast methodology as PSE's normal-load forecast, with an adjustment to account for weather assumptions. Rather than using normal or average heating-degree days ("HDD") to determine the load forecast, the model uses the lowest average HDD from the 1950-2023 historical period for each month.

The Program considers seasonal and monthly load variability, price volatility, and asset optimization, including natural gas storage and pipeline transportation contracts.[2] For example, PSE mitigates its exposure to price volatility in the winter by injecting into storage in the summer when prices are generally low and withdrawing in the winter when prices are typically higher.

Transportation assets enable access to multiple supply basins in the region. This provides price diversity and adds to hedging flexibility. In addition to the hedging benefits, storage and transportation capacity can be further optimized in the wholesale market to reduce commodity costs.

2 | Oversight and Controls

The hedging program is governed by PSE's Energy Risk Policy ("Policy") and associated Energy Supply Transaction and Hedging Procedures Manual ("Procedures"). PSE's Policy and Procedures lay out the policies that govern energy portfolio management activities and define the roles and responsibilities of various departments. In addition, PSE's Board of Directors provides executive oversight of these areas through the Audit Committee. The Policy and Procedures are approved by PSE's Energy Management Committee ("EMC").

The EMC comprises five PSE officers and oversees the activities performed by both the Energy Supply Merchant ("ESM") and Energy Risk Control departments. The EMC is responsible for providing oversight and direction on all portfolio risk issues in addition to approving long-term resource contracts and acquisitions. The EMC provides policy-level and strategic direction on a regular basis, reviews position reports, sets risk exposure limits, reviews proposed risk management strategies, and approves policy, procedures, and strategies for implementation by PSE staff.

Energy Risk Control is responsible for independently monitoring, measuring, quantifying and reporting official risk positions and performing credit analyses.

PSE's ESM department is responsible for all Front Office activities including developing and implementing portfolio management strategies and transacting in the markets for power and gas within the requirements of the Policy and Procedures, including the hedging program. The ESM department comprises energy market analysts, energy traders, and other professionals. The ESM also makes recommendations for policy changes, which must be incorporated into the Policy and Procedures by Energy Risk Control and approved by the EMC. The ESM Director informs Energy Risk Control in writing which staff members are "Authorized Traders" and of any special limitations on any such person's authority. All Authorized Traders who transact on behalf of PSE must operate

[2] These considerations are based on materials and guidance provided during the Michael Gettings workshops hosted by the WUTC. Specifically, Gettings', Natural Gas Utility Hedging Practices and Regulatory Oversight (2015), provided the framework for assessing changes to the hedging program; Michael Gettings, "Natural Gas Utility hedging Practices and Regulatory Oversight" (RiskCentrix, LLC,n.d.), pp. 1-57. ("Gettings (2015)"). Attached as **Appendix B**.

within approved limits set forth in or pursuant to the Procedures, including any applicable credit or transaction limits.

ESM provides the EMC with a monthly update of market conditions, hedging activity, a forecast of hedging costs or gains, and other information including:

(i) Current market prices and changes from previous update
(ii) Hedge mark-to-market
(iii) Options premiums
(iv) Hedge prices (including fixed price and option strikes)
(v) Risk responsive market prices and volatility in relation to the tiered tolerance boundaries

For the 2024-2025 Purchased Gas Adjustment (PGA) year PSE has not made changes to its hedging policies or practices. PSE has maintained its programmatic, risk-responsive, and discretionary strategies.

There is no relationship between natural gas hedging gains or losses that are included in electric power costs and hedges that are part of the natural gas operations. All transactions between PSE's power and natural gas operations are done at prevailing market prices consistent with the guidelines provided in the Procedures.

PSE's natural gas customers are only in the state of Washington, therefore there is no need to allocate costs between jurisdictions.

3 | Overview of PSE Natural Gas Hedging Strategies

3.1 Programmatic Strategy

The goal of the programmatic strategy is prescribed, ratable risk reduction. PSE's programmatic strategy covers 35% of forecasted annual demand. The strategy is a prescribed, dollar-cost-averaging approach where hedges are added consistently over a three-year time horizon. Hedging volumes are added seasonally in eight, four-month hedging periods.

Authorized Traders enter each four-month period with a required hedging volume for that respective period. They have flexibility regarding how they transact to meet that requirement, but they typically hedge proportionally. Because PSE's load is unevenly distributed across the months within the summer and winter seasons, Authorized Traders hedge with a combination of seasonal and monthly transactions. While some transactions may be in seasonal strips, these are rebalanced by authorized traders in order to achieve hedging targets.

The hedged-volume weighting increases over time to reduce the risk of hedge costs over the three-year time horizon. This was designed in a historically contango gas market structure where future prices are higher than spot prices. Under contango conditions, three years in advance of delivery, approximately [redacted] of load is hedged; two years in advance of delivery, an additional [redacted] is hedged; one year in advance of delivery, the remaining [redacted] is added to equal approximately 35% of forecasted load. **Figure 2** illustrates the ratable programmatic strategy.

When market conditions diverge from the historical contango, PSE has flexibility to accelerate programmatic

hedging prior to the delivery year, while still maintaining the 35%-of-load target. This flexibility allows PSE to take advantage when backwardation (future prices below spot prices) becomes evident throughout the gas market by shifting volumes from the 7 and 8 hedging windows to the periods preceding. **Figure 3** demonstrates the flexibility to shift the hedge volume percentages in a backwardated market.

Figure 2 Programmatic Hedging Timeline

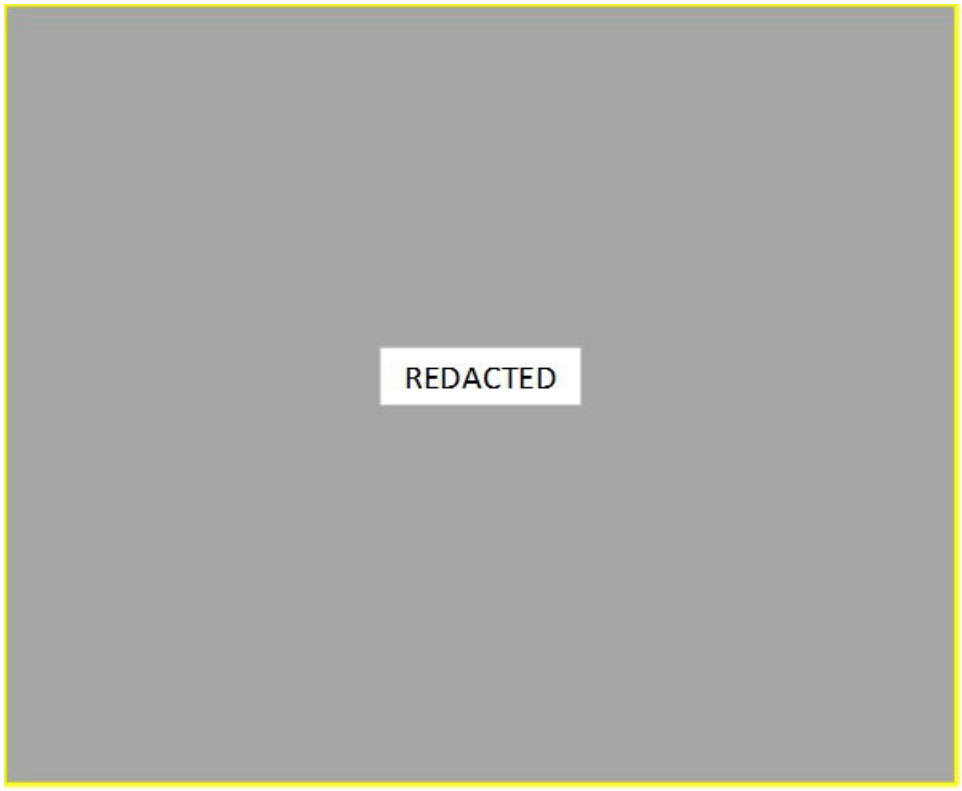
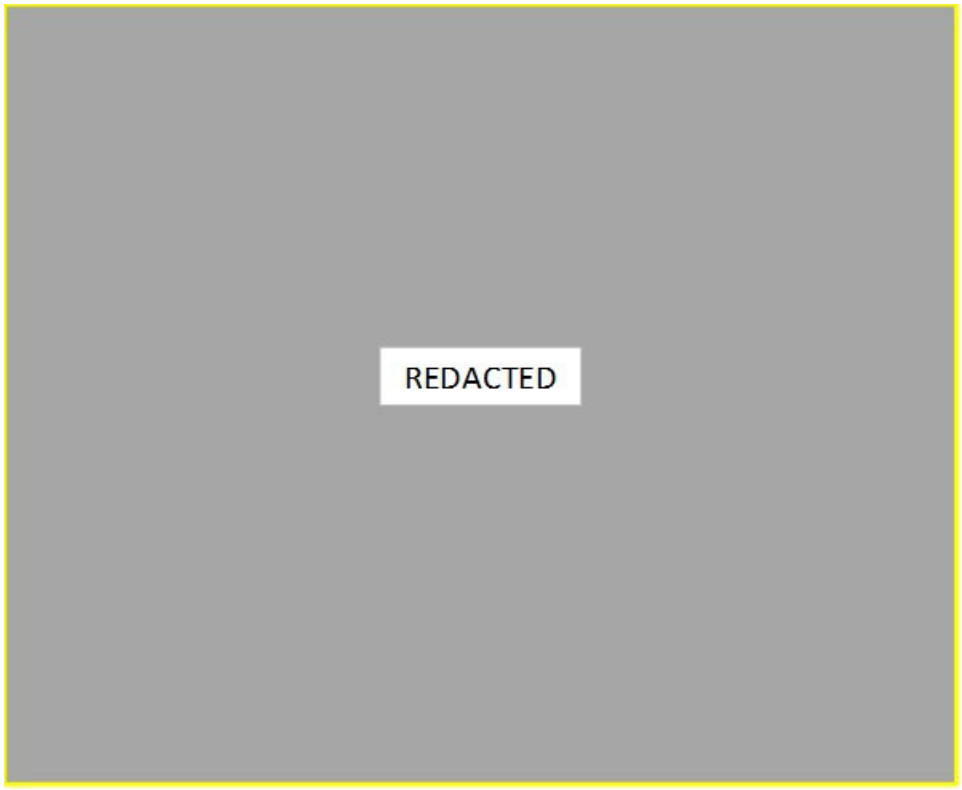


Figure 3 Accelerated Programmatic Hedging Timeline



3.2 Risk-Responsive Strategy

PSE implemented a risk-responsive strategy in the hedging program beginning in the 2018 – 2019 PGA year. The goal of the risk-responsive strategy is to defend against price volatility with a "risk view," as opposed to a "market view."[3] Risk-responsive hedges are added to mitigate the risk of higher prices. If hedges are not required, then hedge losses will not be incurred. The risk-responsive strategy has a capacity of approximately 15% of demand. Hedges are added under this strategy depending on market-risk conditions.

"Exposure" for the risk-responsive strategy is measured and monitored by the ESM and Energy Risk Control using a risk-responsive model ("Risk-Responsive Model"). The current exposure calculation and the potential for future price movement (i.e., value-at-risk, or VaR) govern hedge execution in this strategy (i.e., prescribe hedging when necessary based on a risk view). PSE's Energy Risk Control group updates the model on a weekly basis, ensuring that all executed transactions are captured and that the output is validated with current prices and volatility metrics.

Updating the model weekly allows the ESM sufficient time to analyze market liquidity and determine the best way to strategically transact in the market in order to stay within risk-tolerance boundaries.[4] Updating the model more frequently would not provide the ESM sufficient time for strategic hedge execution.

[3] Gettings (2015).
[4] This is consistent with the "holding period" concept described by Michael Gettings in Natural Gas Utility Hedging Practices and Regulatory Oversight (2015).

PSE establishes the risk-tolerance boundary by using annualized volatility to measure the potential increase in future market prices at a 98% confidence level (i.e., two standard deviations). Using the historical average volatility creates an exposure boundary that triggers hedging to protect against severe increases in market prices.

The strategy includes three defined price tiers that protect against adding a large volume of hedging in one interval (i.e., in response to a short-term increase in market prices). The three tiers are set at points corresponding to equal price movements between the market price and the risk-tolerance boundary, with one-third of the risk-responsive hedging capacity available in each tier. When the first tier is breached, up to one-third of the capacity may be hedged; when the second tier is breached, up to two-thirds of the capacity may be hedged; and when the third risk tolerance boundary is breached, the whole capacity can be hedged to reduce risk to higher prices.

The weekly measurement in the Risk-Responsive Model compares current market prices and volatility to the threshold tiers, constraining costs to a 98% confidence level (i.e., two standard deviations). The Risk-Responsive Model informs ESM of the potential for higher prices (i.e., VaR-C) and displays the weekly measurements including prices and volatility. To assess risk to higher prices, the Risk-Responsive Model compares the sum of portfolio price and VaR-C (i.e., two-sigma portfolio price) against the tiered threshold boundaries. In the event that the weekly measurement reveals that the two-sigma portfolio price exceeds the threshold boundaries, hedges are executed.

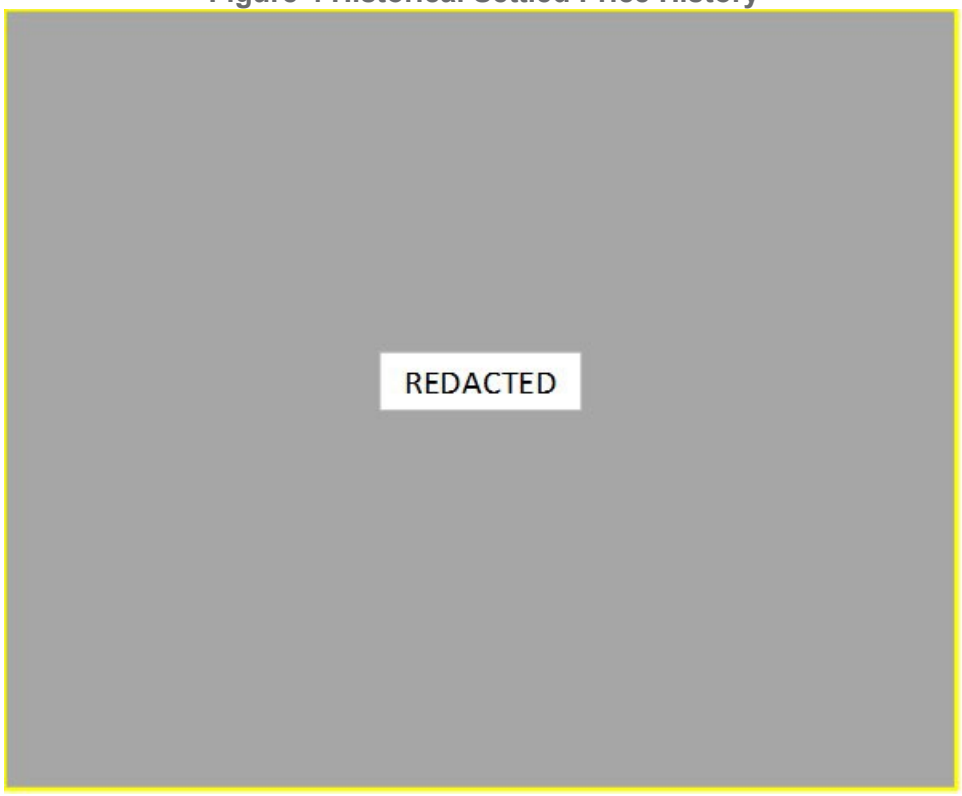
The Risk-Responsive Model also measures VaR-L, which is the risk to higher hedge costs. PSE uses this Risk-Responsive Model output to review and evaluate potential hedge losses and hedge execution strategies.

3.3 Discretionary Strategy

The goal of the discretionary strategy is to increase hedging at low-cost opportunities. In this strategy, hedge volumes change with market prices. This strategy references the [redacted] Hedges may be transacted beginning twelve months prior to the start of a winter or summer season. To prevent the concentration of transactions at any one price, PSE adds hedges incrementally as market prices fall. **Figure 4** shows the [redacted] The discretionary strategy hedges up to approximately 15% of demand.

In addition to low cost discretionary strategy, PSE has supplemental discretionary capacity to add director approved hedges to manage the 15% unhedged open position based on changes to market risks.

Figure 4 Historical Settled Price History



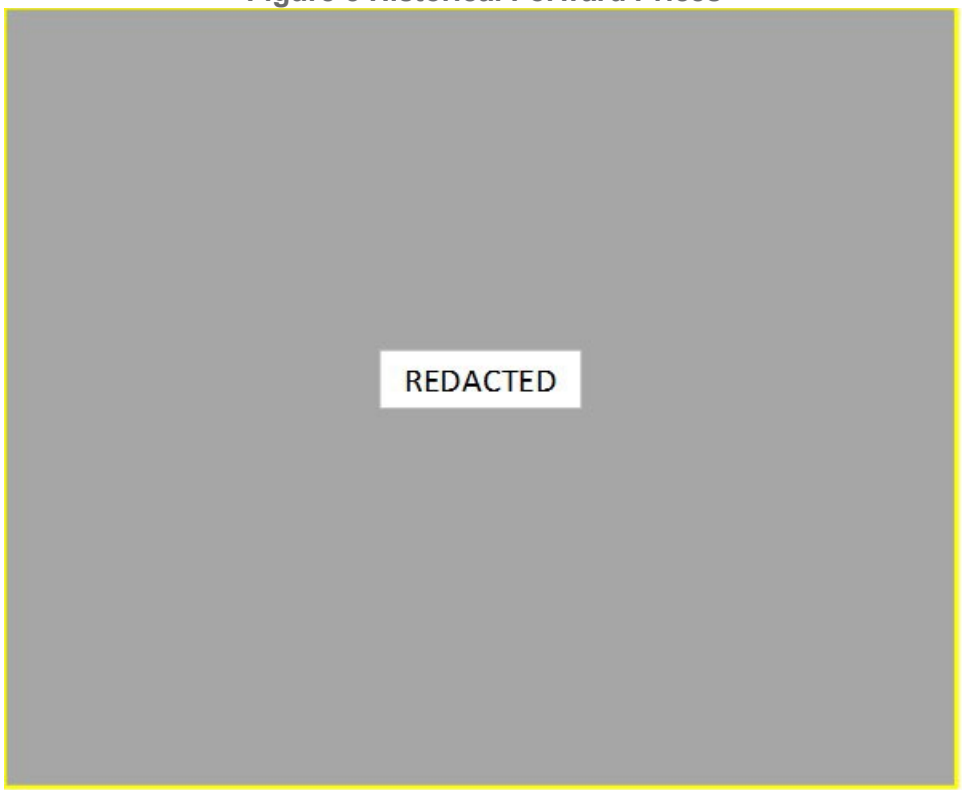
4 | PSE Natural Gas Hedging 2023-2024 Retrospective

4.1 Market Recap

Going into winter 2023-24 natural gas prices were elevated, especially in western markets, due to risk premiums and concerns for cold weather causing daily supply issues. US natural gas storage inventory levels were well above the 5 year average[5], with production continuing to increase to record highs. The western US experienced a slightly colder than normal November and a mild December, but experienced a record cold event in January that led to price spikes in both the western natural gas and power markets. PSE relied heavily on storage withdrawals to supply gas during the January event. A mild winter in the eastern half of the US led to lower demand and prices declined significantly from late January through the rest of the winter. As an example, the Sumas forward price for February was $8.49/MMBtu on November 1, 2023 and fell to $4.71 by January 31st.

Figure 5 presents average forward prices at the NYMEX Henry Hub, AECO, Rockies, and Sumas basins for the 2023-2024 PGA year to date during the hedging timeframe through June 2024

Figure 5 Historical Forward Prices



4.2 Hedge Results

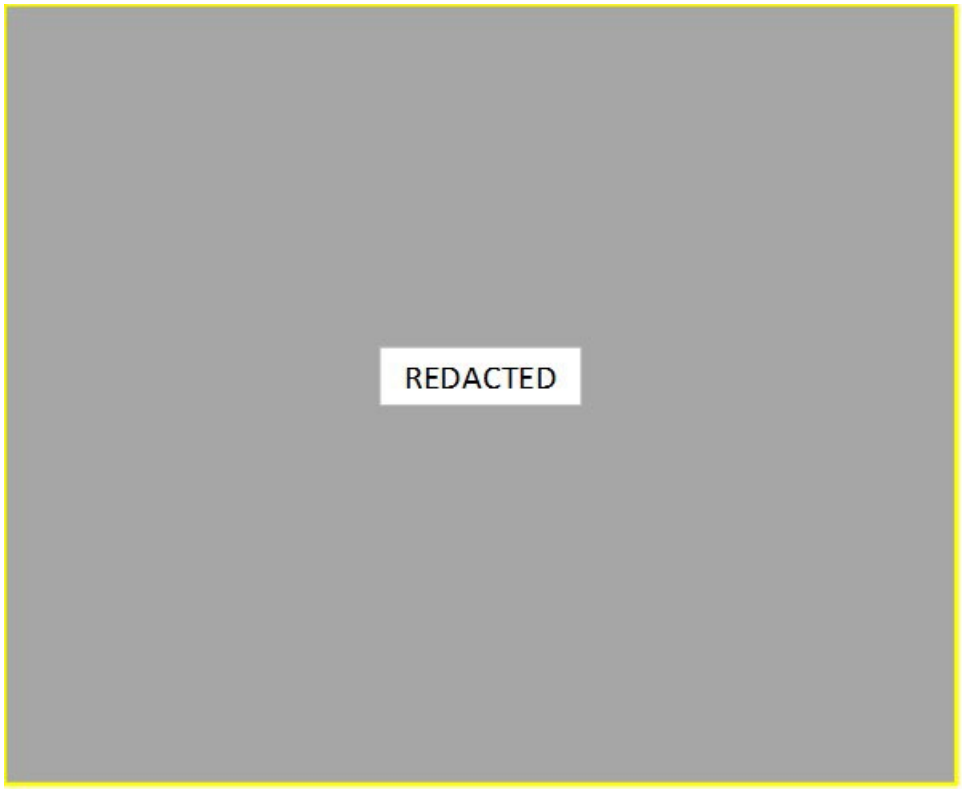
The 2023-2024 PGA year included a dynamic market environment with relatively high prices during most of the winter hedging period followed by a steep decline in both forward and settled prices by early in the PGA year.

[5] EIA.gov

PSE's discretionary and risk responsive strategies were both triggered and executed in accordance with the plan. Due to a mild winter across much of the US, record high natural gas production, and storage levels well above the 5-year average, natural gas prices decreased significantly from the beginning of winter to the spring. With natural gas prices dropping steadily from the beginning of winter, PSE experienced losses on many of the hedges executed prior to this time. However, unhedged volumes allowed PSE to benefit from the lower spot market prices.

Table 1 shows PSE's hedging gains / (losses) and option premiums on trades entered into between March 2021 and July 2024 with delivery between November 2023 and July 2024.

Table 1 Hedging Gains / (Losses) and Option Premiums

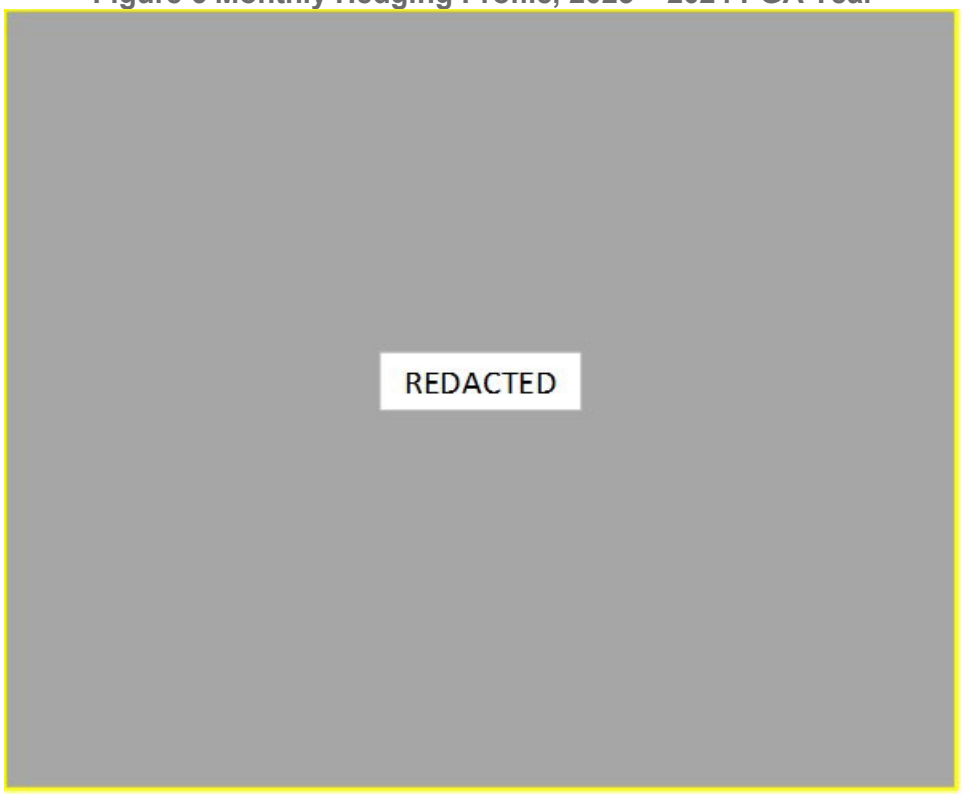


4.3 Hedging Profile

PSE managed price risk with a combination of programmatic, risk-responsive, and discretionary hedges as well as storage in accordance with the hedging plan outlined in the 2023 PGA. Due to load/demand and early winter storage management PSE add discretionary hedges to reduce risk in peak demand winter months.

Figure 6 illustrates how much volume was hedged by strategy relative to the low-demand forecast and actual demand, by month from November 2023 through June 2024. The low-demand forecast includes storage injections for summer refill. Storage injections are included in the total demand profile.

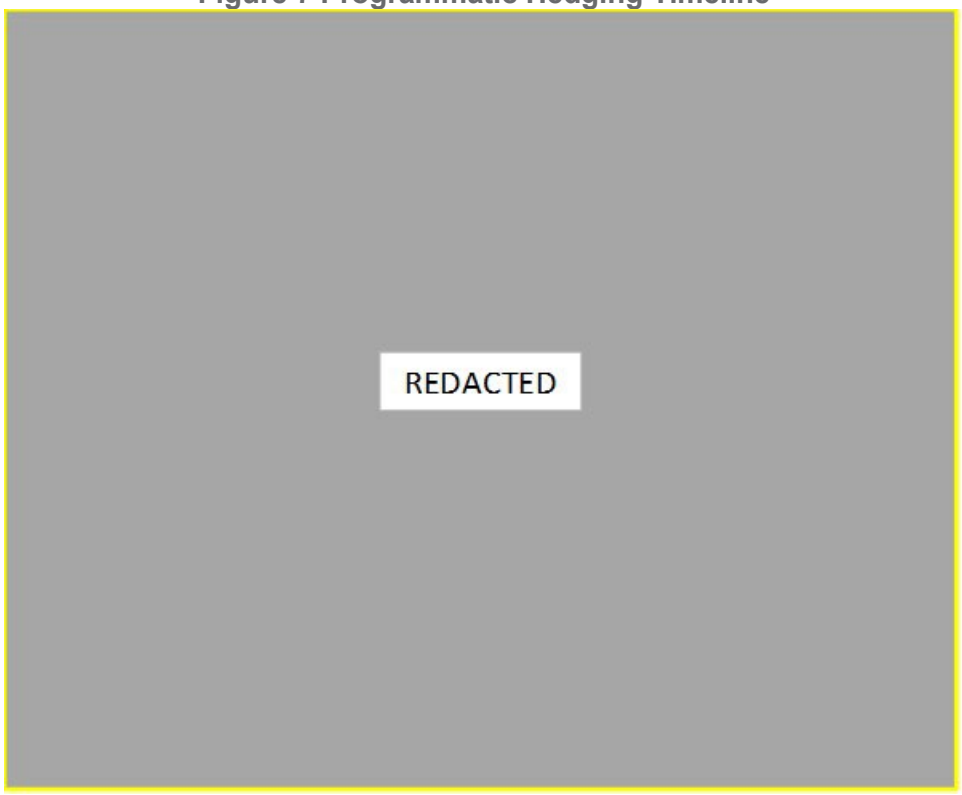
Figure 6 Monthly Hedging Profile, 2023 – 2024 PGA Year



4.4.a Programmatic Strategy: 2023 Retrospective

Hedges were added ratably as part of the programmatic strategy over the three-year time horizon beginning in March 2021 for the 2023 – 2024 PGA year. This strategy provided a defined hedge volume of approximately 35% of PGA-year load prior to the start of the November 2023 – March 2024 winter. Hedges were added in eight, four-month periods for the winter and summer seasons, consistent with PSE's dollar-cost-averaging approach. These hedges were executed using financial swaps. **Figure 7** shows the timeline of hedges executed as part of the programmatic strategy. **Section 4.4.b** highlights an example of a hedge executed as part of this strategy.

Figure 7 Programmatic Hedging Timeline



4.4.b Programmatic Strategy: Highlighted Example

As shown in **Figure 7** and in **Appendix A**, hedges were added ratably during the 32 month programmatic hedging period. For example, Deal Number 95140[6] was transacted on September 16, 2022 for the November 2023 through March 2024 period. This financial swap hedged 2,500 MMBtu/day of Rockies fixed priced risk for the five-month winter season. This trade increased the cumulative hedged volume to 105,000 MMBtu/day for winter 2023-2024, or approximately 20% of forecasted winter load.

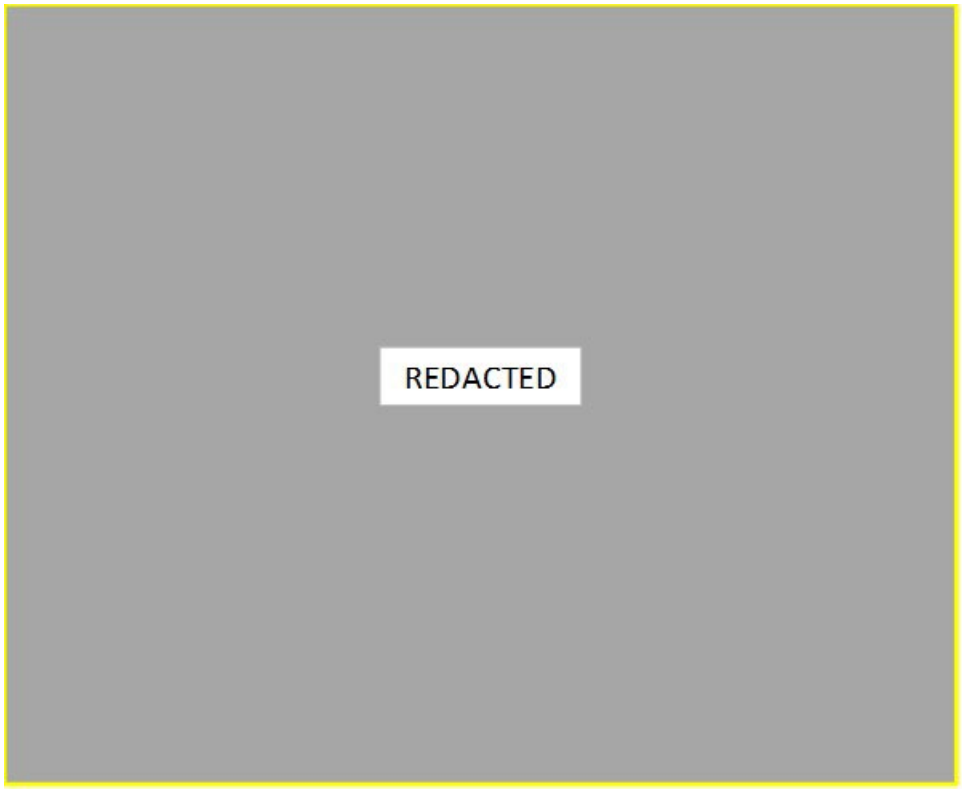
4.5.a Risk-Responsive Strategy: 2023 Retrospective

For the 2023 – 2024 PGA year, PSE developed the exposure boundary for the risk-responsive strategy using a 30% annualized volatility, based on data from forward marks for the period from November 2020 through October of 2023. This is consistent with the approach defined in the strategy. The three-tiered boundaries were developed to split the difference equally between the current market prices and the exposure boundary.

Figure 8 shows PSE's risk-tolerance boundary compared to the volatility in PGA years 2020, 2021, and 2022.

[6] Please see Appendix A for a complete list and details of hedging transactions entered for the 2023-2024 PGA year

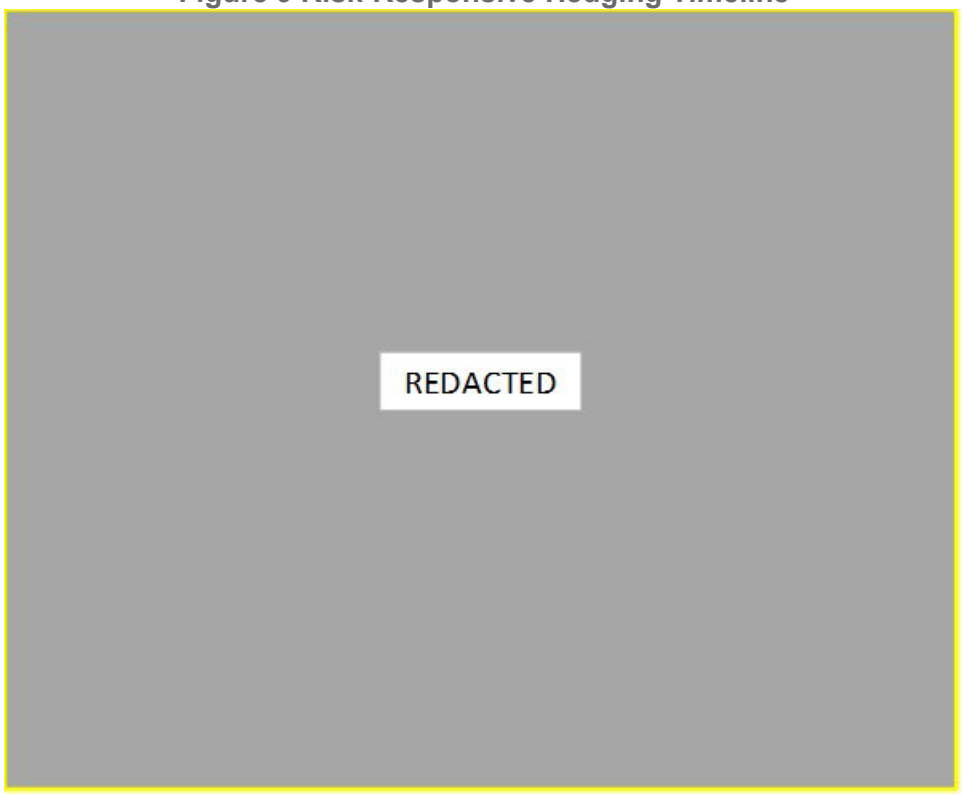
Figure 8 Historical Volatility Used to Establish Risk-Responsive Boundaries



Winter and summer seasonal tiered tolerance boundaries for the 2023 – 2024 PGA year were initially set in October 2021. These boundaries were updated in 2022, concurrent with the 2022 – 2023 PGA, to account for changes in forward prices. They were updated again in 2023 using prices from the 2023 – 2024 PGA, at which time monthly tiered tolerance boundaries were established for the prompt year.

The Risk-Responsive Model first triggered hedging for the 2023 – 2024 PGA year on March 18, 2022. From the first trigger until July 2024, the Risk-Responsive Model triggered hedging 23 more times for the November 2023 through October 2024 delivery periods as prices and measured volatility increased. **Figure 9** shows the timeline of hedges executed for the 2023-2024 PGA year in response to breaches of the tiered tolerance boundaries. **Section 4.5.b** highlights an example of a hedge executed as part of this strategy.

Figure 9 Risk-Responsive Hedging Timeline



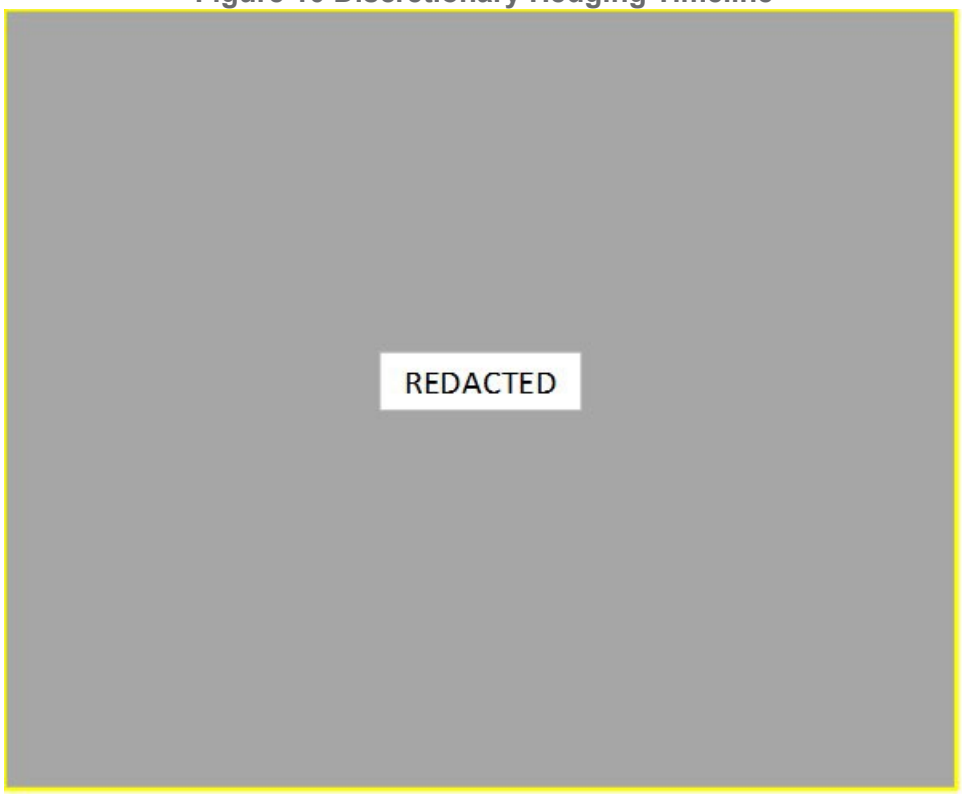
4.5.b Risk-Responsive Strategy: Highlighted Example

As shown in **Figure 9**, hedges were transacted in response to breaches of the threshold tiers established for winter 2023-24. For example, on November 28, 2022, a hedging requirement was triggered for the winter 2023-24 delivery period (see the second-to-last last risk-responsive trade shown in **Figure 9**). Week-over-week, forward prices increased from $6.61/MMBtu to $7.02/MMBtu. Modeled volatility slightly increased from 25% to 26%, driving two-sigma prices from $7.31/MMBtu to $7.78/MMBtu. This breached the first threshold tier in the winter 2023-24 season and required 7,500 MMBtu/day in additional hedging in order to reduce further risk to higher prices. Two financial swaps (see Deal Numbers 97217 and 97228 in **Appendix A**) were entered on November 30, 2022, for 5,000 MMBtu/day and 2,500 MMBtu/day respectively at Rockies in order to satisfy the risk reduction required by the Risk-Responsive Model.

4.6.a Discretionary Strategy: 2023 Retrospective

In the discretionary strategy, low-price triggers twelve months prior to the start of the 2023 – 2024 PGA year provided additional hedging. Hedges for the winter and summer seasons were added gradually over seventeen months, beginning in November 2022 increasing the hedge ratio towards 15% of capacity as prices remained below the trigger. PSE added hedges over the seventeen-month period to prevent the concentration of transactions at any one price. **Figure 10** shows the timeline of hedges executed as part of the discretionary strategy. **Section 4.6.b** highlights an example of a hedge executed as part of this strategy.

Figure 10 Discretionary Hedging Timeline



4.6.b Discretionary Strategy: Highlighted Example

As shown in **Figure 10** and **Appendix A**, discretionary hedges were entered into in response to low-price triggers during the period. For example, Deal Number 103365 was transacted on May 3, 2023. This financial swap hedged 10,000 MMBtu/day of Rockies fixed priced risk for the month of November 2023. This hedge brought the total hedge volume under this strategy to 30,000 MMBtu for November 2023.

5 | Conclusion

In summary, the PSE Hedge Plan has the hedging capacity to meet our low load forecast with a diversified program that includes a combination of programmatic, risk-responsive, and discretionary protocols along with storage assets to manage costs. This results in a program that balances price stability with the cost of hedging.

In the 2023 – 2024 PGA year, the programmatic strategy provided a foundation of dollar-cost averaging and the risk-responsive strategy provided further risk reduction as it triggered in response to volatility and price increases. The low cost discretionary strategy allowed PSE to participate in low price hedging opportunities and the supplementary discretionary was used to further reduce PSE open position in response to market risks. Remaining unhedged volumes allowed PSE to benefit from low spot market prices.

PSE has not made changes to its hedging programs for the 2024 – 2025 PGA year, but continues to evaluate and consider improvements on an ongoing basis.