Puget Sound Energy

2021 Natural Gas Hedging Plan and 2020 Purchased Gas Adjustment Retrospective

September 2021

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

REDACTED

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1 | Objectives and Goals

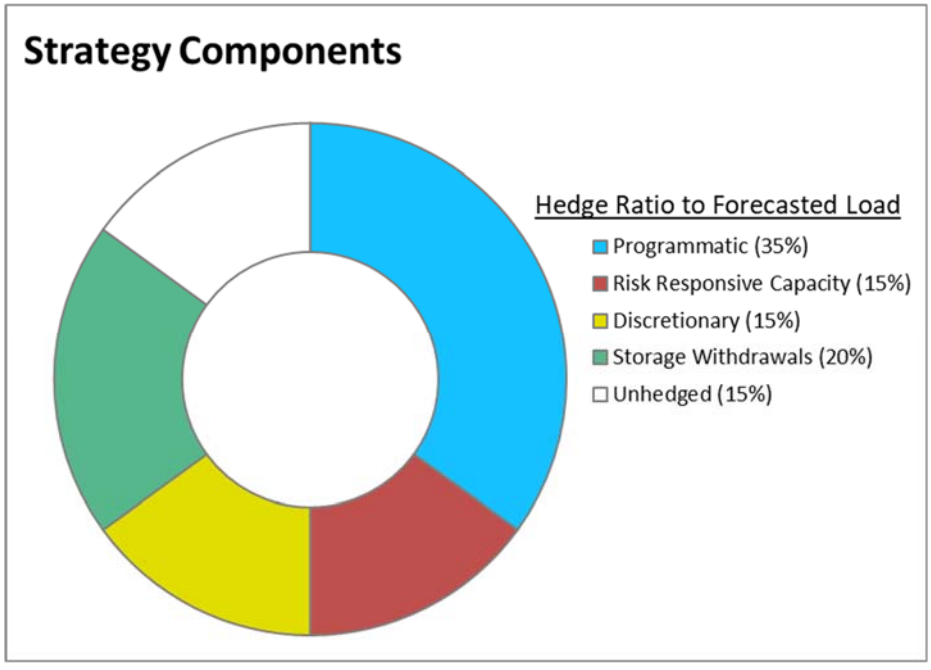
The goal of Puget Sound Energy's ("PSE") natural gas local distribution company ("LDC") hedging program ("Program") is to balance the benefit of price stability for our customers with the cost of hedging. The two primary measurable objectives of the Program relate to hedging volume and to diversity of strategies.

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 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 1950-2019 historical period for each month. On average during the 2021-22 PGA year, the low load forecast is [redacted] of the expected load.

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 generally high.

Transportation assets provide access to multiple supply basins in the region. This promotes price diversity and adds to hedging flexibility. In addition to the hedging benefits, unutilized storage and transportation capacity are 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

[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)").

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 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, and a forecast of hedging costs or gains. The update includes the following information:

(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 2020-2021 Purchased Gas Adjustment (PGA) year PSE has not made changes to its hedging policies or practices. PSE has maintained its programmatic, risk-responsive, and low price 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

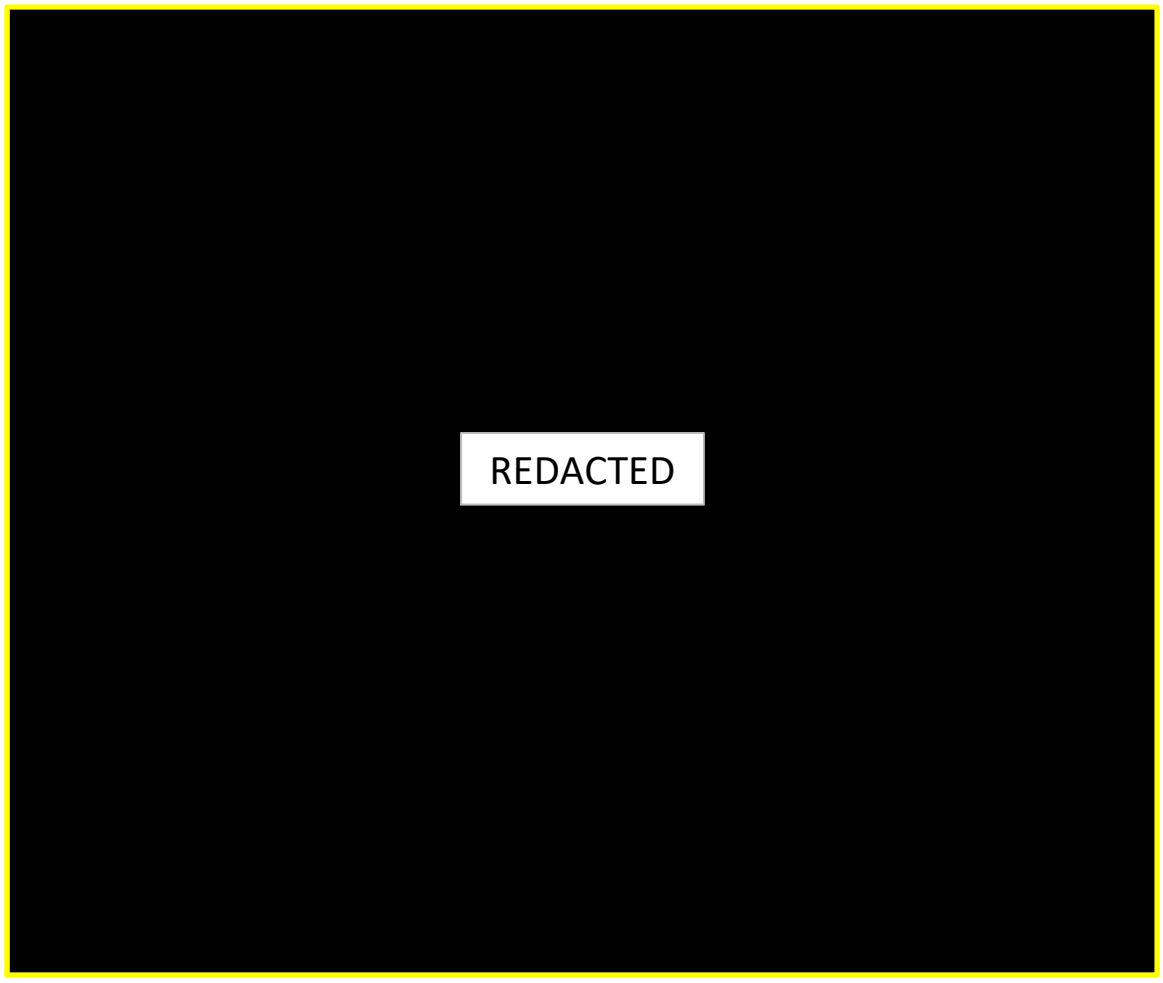
The goal of the programmatic strategy is prescribed, ratable risk reduction. PSE’s programmatic strategy covers 35% of forecasted annual demand. The strategy is a prescribed, dollar-cost-averaging approach where hedges are added consistently over a three-year time horizon. Hedging volumes are added seasonally 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. 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 35% of load. PSE has some flexibility to accelerate programmatic hedging in the first year of hedging—i.e.,

approximately three years in advance of delivery—while still maintaining the 35%-of-load target. PSE's Front Office has discretion to accelerate programmatic hedging when forward prices fall below the current PGA commodity cost. **Figure 2** illustrates the ratable flexibility of the programmatic strategy.

Figure 2 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

[3] Gettings (2015).

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 to 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.

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 risk tolerance boundary is breached, the whole capacity is available 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.

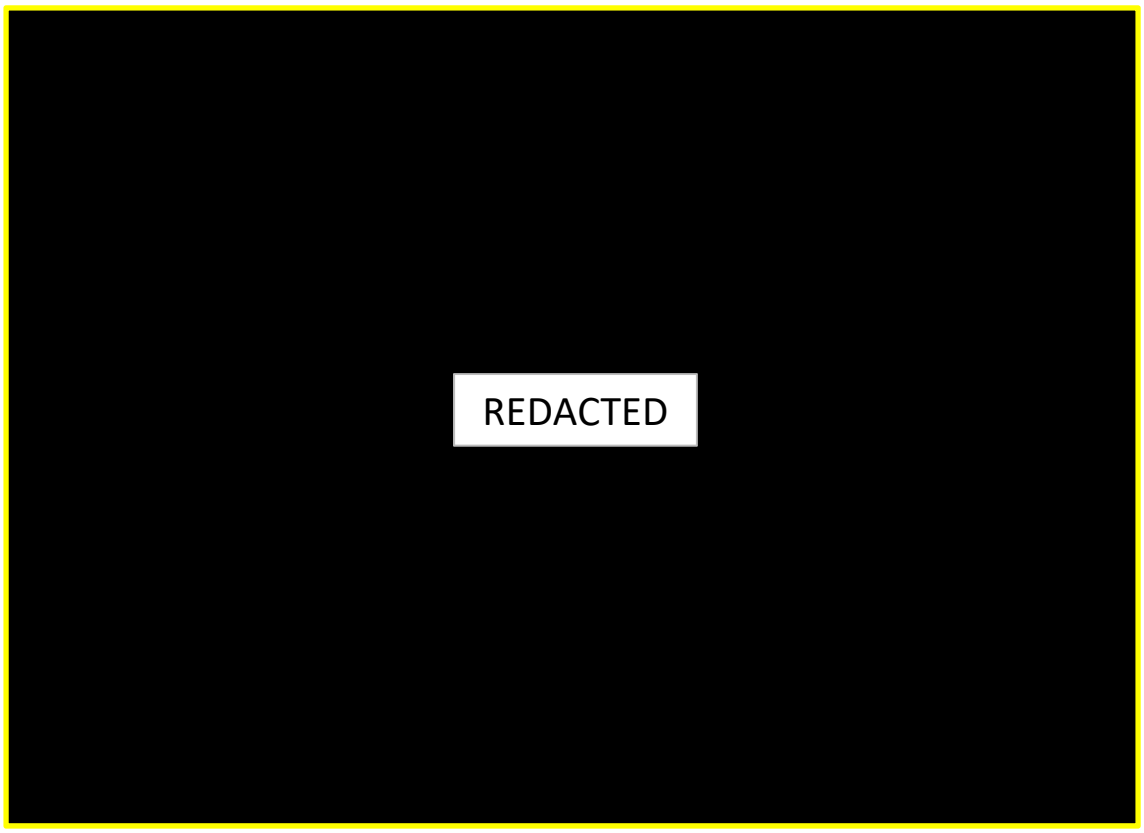
The Risk-Responsive Model also measures VaR-L, which is the risk to higher hedge costs. PSE uses this Risk-Responsive Model output to review and evaluate potential hedge losses and hedge execution strategies.

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 3** shows the [redacted] The discretionary strategy hedges up to approximately 15% of demand.

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

Figure 3 Historical Settled Price History



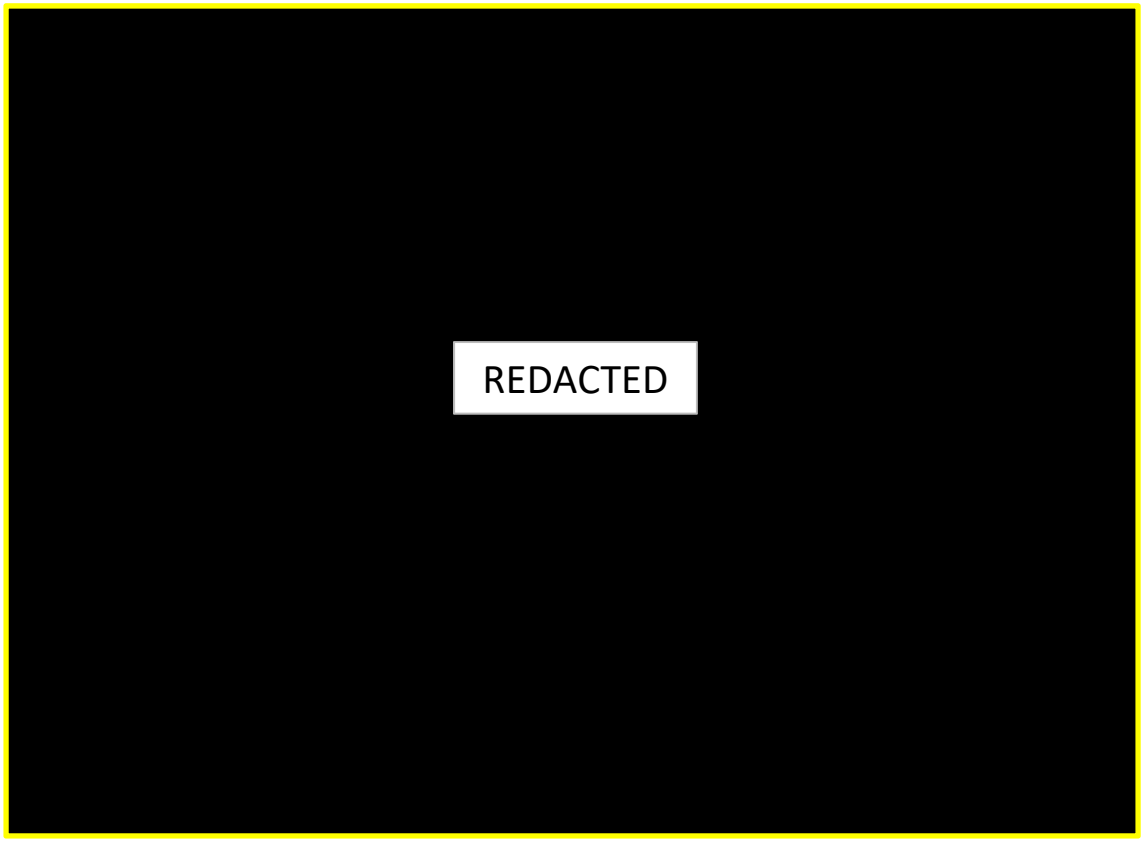
4 | PSE Natural Gas Hedging 2020 Retrospective

4.1 Market Update

Forward natural gas prices increased significantly during PSE's hedging timeframe for the 2020-2021 PGA year, which covers November 2020 through October 2021. The macro story can be seen by looking at the move in the NYMEX Henry Hub prices. National natural gas prices have steadily increased since March 2020. This is mostly due to and structural supply/demand changes that have included overall domestic production declines, increases in natural gas demand for power production, and liquefied natural gas (LNG) exports. Additionally, western regional prices have risen relative to NYMEX Henry Hub prices.

Figure 4 presents historical forward prices at the NYMEX Henry Hub, AECO, Rockies, and Sumas basins for the 2020-2021 PGA year to date during the hedging timeframe through June 2021.

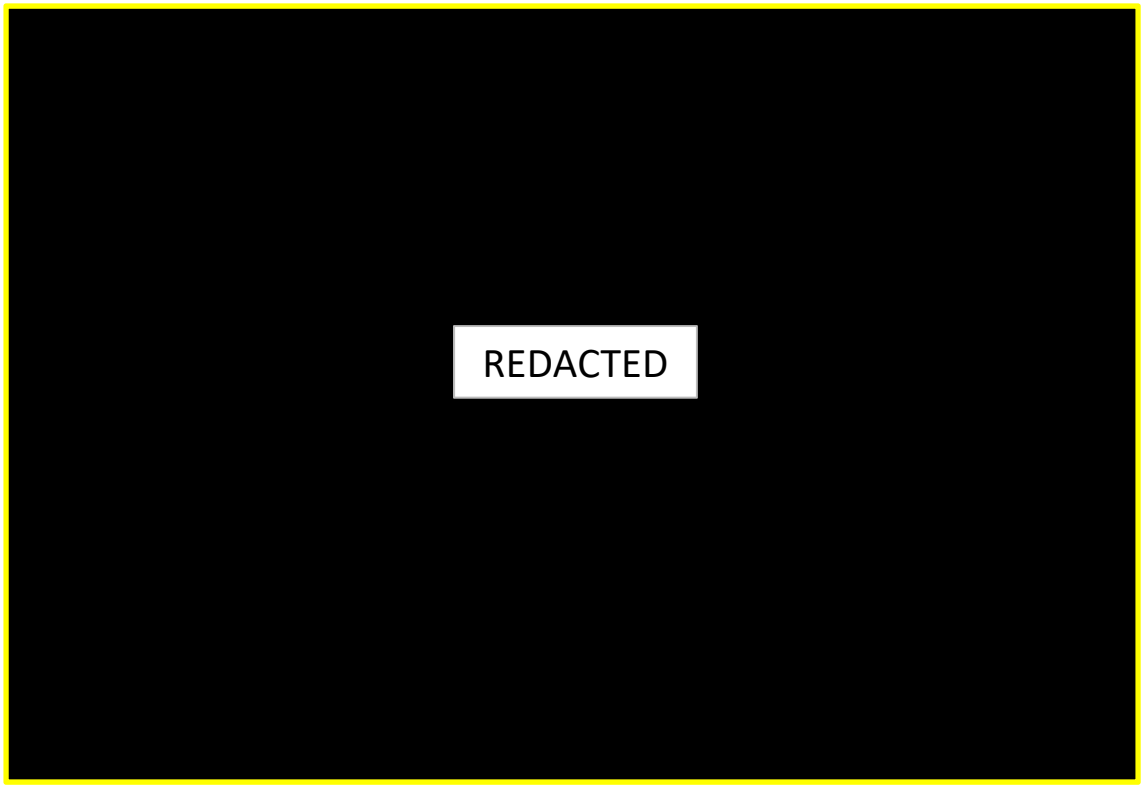
Figure 4 Historical Forward Prices



4.2 Hedge Costs

Table 1 shows PSE's hedging gains/(losses) and option premiums on trades entered into between March 2018 and July 2021 with delivery between November 2020 and July 2021.

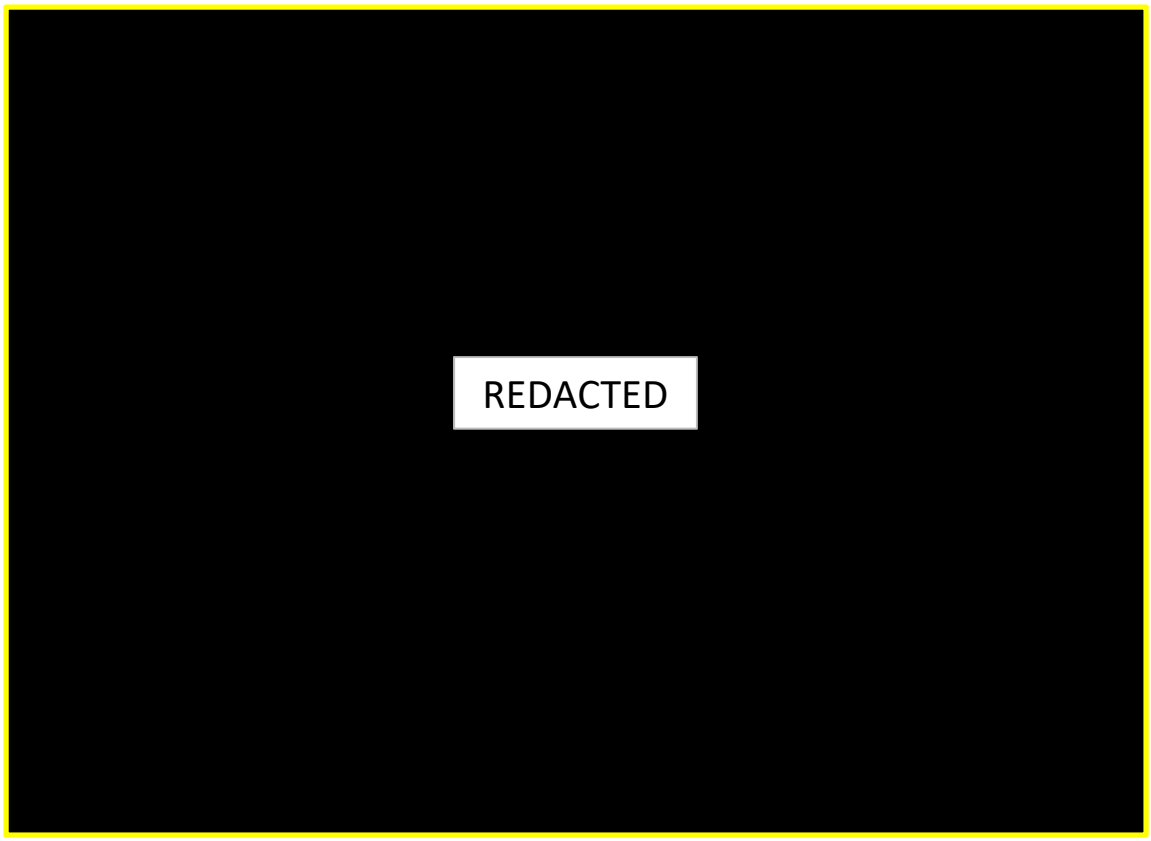
Table 1 Hedging Gains/(Losses) and Option Premiums



4.3 Hedging Profile

PSE managed winter price risk with a combination of programmatic, discretionary, and risk-responsive hedges as well as storage in accordance with the hedging plan outlined in the 2020 PGA. **Figure 5** illustrates how much volume was hedged by strategy relative to the low-load forecast and actual load, by month from November 2020 through June 2021. The low-demand forecast includes net demand from storage injections.

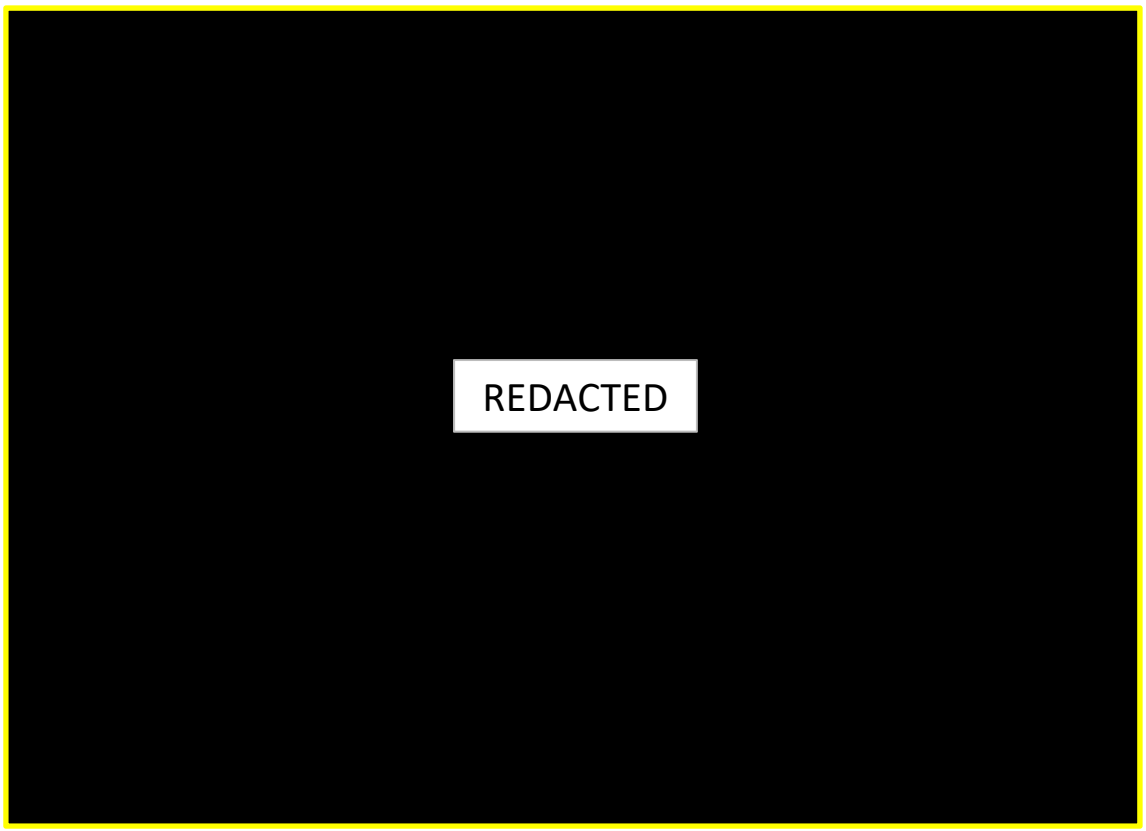
Figure 5 Monthly Hedging Profile, 2020 – 2021 PGA Year



4.4.a Programmatic Strategy: 2020 Retrospective

Hedges were added ratably as part of the programmatic strategy over the three-year time horizon beginning in March 2018 for the 2020 – 2021 PGA year. This strategy provided a defined hedge volume of approximately 35% of PGA-year load prior to the start of the November 2020 – March 2021 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 a mix of financial swaps and call options, and they accounted for monthly load variability. **Figure 6** 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 6 Programmatic Hedging Timeline



4.4.b Programmatic Strategy: Highlighted Example

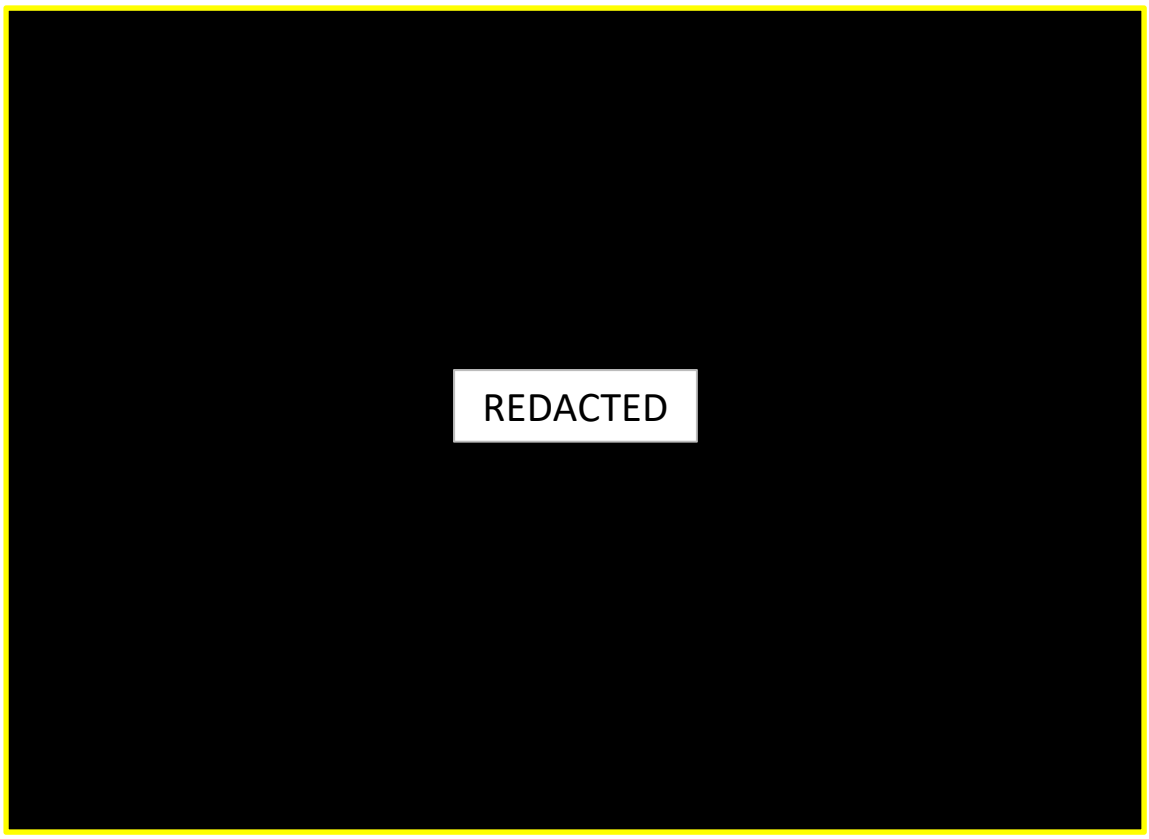
As shown in **Figure 6** and in **Appendix A**, programmatic hedges were added ratably throughout the four-month hedging window. For example, Deal Number 67421 was transacted on November 21, 2019 within the sixth hedging window (i.e., twelve months prior to the first delivery month) for the November 2020 through March 2021 period. This financial swap hedged 2,500 MMBtu/day of Sumas fixed priced risk for the five-month winter season. This trade increased the hedge volume to 75,000 out of 130,000 MMBtu/day (i.e., 20% of average winter load).

4.5.a Risk-Responsive Strategy: 2020 Retrospective

For the 2020 – 2021 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 2017 through October of 2020. 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 7 shows PSE's risk-tolerance boundary compared to the volatility in PGA years 2017, 2018, and 2019.

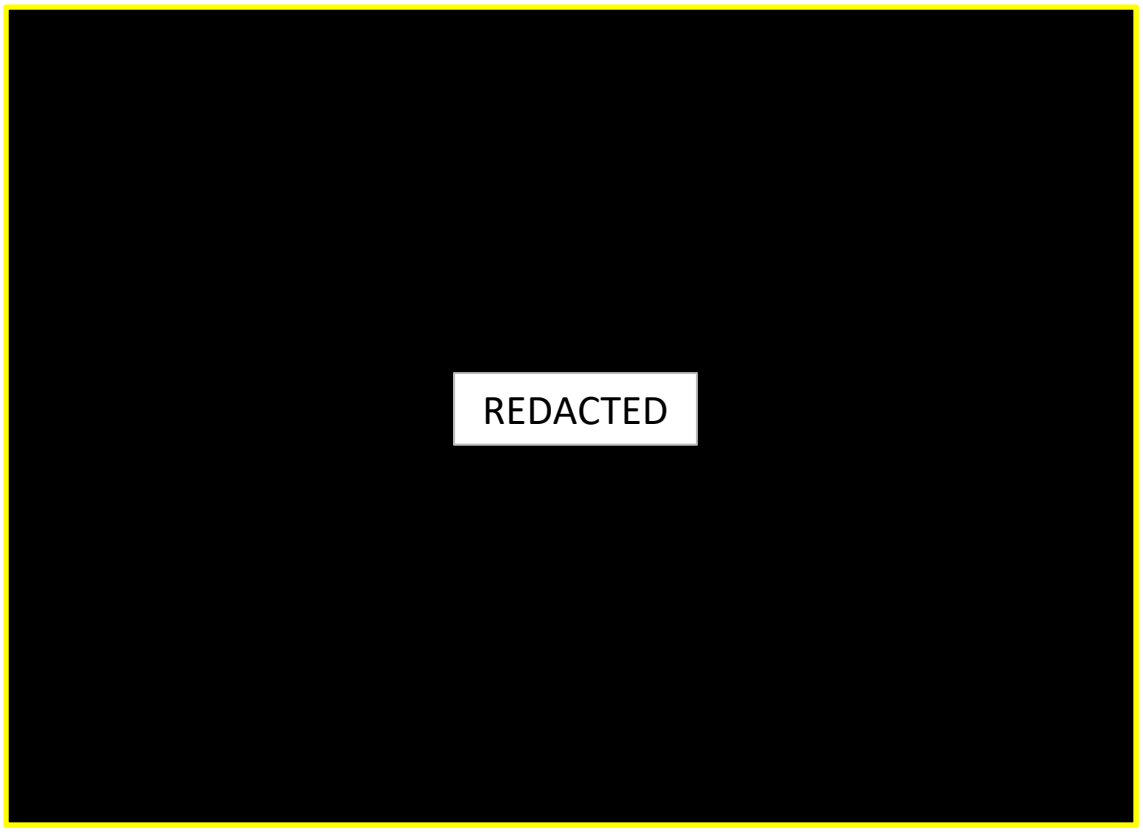
Figure 7 Historical Volatility Used to Establish Risk-Responsive Boundaries



Winter and summer seasonal tiered tolerance boundaries for the 2020 – 2021 PGA year were initially set in October 2018. These boundaries were updated in 2019, concurrent with the 2019 – 2020 PGA, to account for changes in forward prices. They were updated again in 2020 using prices from the 2020 – 2021 PGA, at which time monthly tiered tolerance boundaries were established for the prompt year.

The Risk-Responsive Model first triggered hedging for the 2020 – 2021 PGA year on March 12, 2019. Upon triggering, PSE added transactions for the November 2020 – March 2021 delivery period. From the first trigger until July 2021, the Risk-Responsive Model triggered hedging twenty-seven more times for the November 2020 through October 2021 delivery periods as prices and measured volatility increased. Throughout this time period, multiple threshold boundaries were triggered, prescribing incremental hedging and limiting the weekly concentration of hedges. **Figure 8** shows the timeline of hedges executed for the January 2021 delivery month 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 8 Risk-Responsive Hedging Timeline



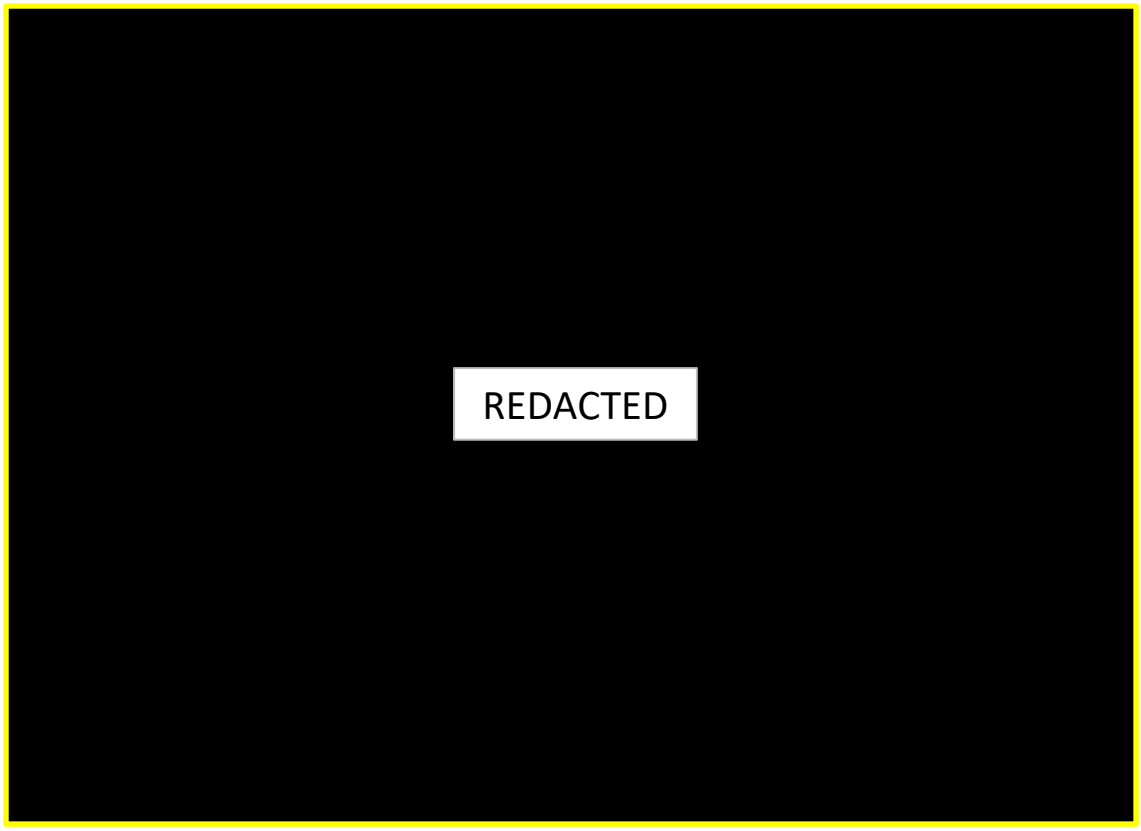
4.5.b Risk-Responsive Strategy: Highlighted Example

As shown in **Figure 8**, hedges were transacted in response to breaches of the threshold tiers established for January 2021. For example, on October 13th, 2020, a hedging requirement was triggered for the January 2021 delivery month (see the last risk-responsive trade shown in **Figure 8**). Week-over-week, forward prices increased from $4.82/MMBtu to $5.18/MMBtu. Modeled volatility held steady at 20%, driving two-sigma prices from $4.94/MMBtu to $5.28/MMBtu. This breached the second threshold tier in January and required 10,000 MMBtu/day in additional hedging in order to reduce further risk to higher prices. One financial swap (see Deal Number 76185 in **Appendix A**) was entered into on October 15th for 10,000 MMBtu/day at AECO in order to satisfy the risk reduction required by the Risk-Responsive Model.

4.6.a Discretionary Strategy: 2020 Retrospective

In the discretionary strategy, low-price triggers twelve months prior to the start of the 2020 – 2021 PGA year provided additional hedging. Hedges for the winter and summer seasons were added gradually over seventeen months, beginning in November 2019, increasing the hedge ratio towards the 15% 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 9** 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 9 Discretionary Hedging Timeline



4.6.b Discretionary Strategy: Highlighted Example

As shown in **Figure 9** and **Appendix A**, discretionary hedges were entered into in response to low-price triggers during the period. For example, Deal Number 69768 was transacted on February 4, 2020. This financial swap hedged 5,000 MMBtu/day of AECO fixed priced risk for the winter delivery period from November 2020 through March 2021. This hedge brought the total hedge volume under this strategy to 55,000 MMBtu for the 2020-21 winter season.

5 | Conclusion

In summary, PSE 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.

PSE has not made changes to its hedging policies for the 2020 – 2021 PGA year, but continues to evaluate the Program and to consider improvements on an ongoing basis.

In the 2020 – 2021 PGA year, the programmatic strategy provided a foundation of dollar-cost averaging; the risk-responsive strategy provided further risk reduction as it triggered in response to volatility and price increases; and the discretionary strategy allowed PSE to participate in low price opportunities.