

PURCHASED GAS

Local Market Environment

Local prices during the 2017 calendar year averaged \$2.74 per Dth. This was higher than the 2016 average price of \$2.24 per Dth, an increase of \$0.50 per Dth or about 22%. The 2016 and 2017 monthly index prices are provided in Table 8.1 below.

Table 8.1: NPC First-of-Month (FOM) Index Price per Dth

Month	2016	2017	Difference
Jan	\$2.28	\$3.73	\$1.45
Feb	\$2.02	\$3.11	\$1.09
Mar	\$1.51	\$2.29	\$0.78
Apr	\$1.51	\$2.64	\$1.13
May	\$1.77	\$2.62	\$0.85
Jun	\$1.78	\$2.79	\$1.01
Jul	\$2.52	\$2.63	\$0.11
Aug	\$2.51	\$2.59	\$0.08
Sep	\$2.62	\$2.59	(\$0.03)
Oct	\$2.70	\$2.48	(\$0.22)
Nov	\$2.62	\$2.63	\$0.01
Dec	\$2.99	\$2.73	(\$0.26)
Average	\$2.24	\$2.74	\$0.50

The local market price for natural gas during the 2017-2018 heating season (November-March) averaged \$2.57 per Dth compared to an average price of \$2.95 per Dth during the 2016-2017 heating season, a decrease of \$0.38 or about 13%. The monthly-index prices for the two heating seasons are provided in Table 8.2 below.

Table 8.2: NPC FOM Index Price per Dth - Heating Season

Table 5.2 NPC FOM Index Price per Dth – Heating Season			
Month	2016-2017	2017-2018	Difference
Nov	\$2.62	\$2.63	\$0.01
Dec	\$2.99	\$2.73	(\$0.26)
Jan	\$3.73	\$2.50	(\$1.23)
Feb	\$3.11	\$2.80	(\$0.31)
Mar	\$2.29	\$2.17	(\$0.12)
Average	\$2.95	\$2.57	(\$0.38)

April 2018 PIRA Energy Group (PIRA) and IHS Energy (IHS) forecasts of Rockies indices reflect an average price of approximately \$2.09 per Dth through October 2018. Prices for the 2018-2019 heating season are forecasted to be approximately \$2.41 per Dth.

Annual Gas Supply Request for Proposal

One of the fundamental results of the IRP modeling is the selection of the portfolio of natural gas purchase contracts for the coming year. The Company expects that a significant portion (approximately 55-65%) of the annual gas supply needs of the Company's sales customers will be met with cost-of-service supplies provided under the Wexpro I and II Agreements (see Cost-of-Service Gas section of this report). Supply needs not met by cost-of-service gas must be purchased from natural gas providers. Accordingly, the Company issues an RFP to potential suppliers each year.

On February 23, 2018, the Company sent its RFP to 59 prospective suppliers. The RFP sought proposals for both baseload and peaking supplies on the two major interstate pipeline systems interconnected with the Company; DEQP and KRGT. The Company requested heating season proposals on both pipelines with terms ranging from one to five years. The Company also sought proposals for peaking supplies on both pipeline systems with supply availability of two to four months to meet customer demands during the coldest winter heating season months.

Reliability of supplies is a critical issue for the Company. In its RFP, the Company required that all seasonal purchase contracts have language specifying liquidated damages of \$15.00 per Dth for failure to perform. The Company required all proposals to have language ensuring creditworthiness and language specifying the minimum advance notice before nomination deadlines for gas flow.

Responses to the purchased-gas RFP were due on March 9, 2018. The Company received proposals for 191 gas supply packages from 13 potential suppliers. As part of the RFP requirements, submissions must specify if the same gas supply is offered under multiple proposals. This year, supplies offered under baseload proposals totaled 450,000 Dth/D, up from the 393,000 Dth/D offered last year. Peaking supplies offered on the DEQP system totaled 200,000 Dth/D, down from the 340,000 Dth/D offered last year. Peaking supplies offered on KRGT totaled 445,000 Dth/D, up from last year's level of 410,000 Dth/D.

Each spring, following the receipt of all the proposals, the Company reviews all the packages offered and extracts the parameters needed as data inputs to the SENDOUT model.⁶³ The Company must identify the pricing mechanisms utilized for each package and link each to the appropriate index price in the model. Also, the Company must resolve the availability of receipt and delivery point capacity on the interstate pipeline system. To the extent that the same underlying gas supplies have been offered under different price and term packages, the Company must identify each to prevent the purchasing of more gas than is actually available. This year, the SENDOUT model evaluated 191 supply packages.

After the Company enters these purchased-gas packages into the SENDOUT model, it allows the model to find an optimal linear-programming solution for any one or all of the packages of natural gas. During this optimization process, the SENDOUT model only incurs costs for a package of gas if it elects to include that package. This gives the model freedom to

⁶³ The SENDOUT model and the Monte Carlo method are described in more detail in the Final Modeling Results Section of this report.

look at all packages and optimize them in a way that results in the least-cost combination of resources.

This year the model evaluated 1,250 Monte Carlo draws during the modeling process. At the conclusion of the modeling, the Company analyzed the draws to see which were preferred. Using a statistical analysis package, the Company used a procedure to group (or cluster) optimized draws in similar ways. Clustering is the assignment of a set of observations into subsets so that observations in the same cluster are similar. The Company performs the clustering for Design-Peak Day and annual demand.

The Company then used a follow-up statistical procedure to split clusters at cluster designed levels as shown in Exhibit 8.1. This year, as in other years, the Company broke the cluster analysis into 30 groups and plotted them as representations of optimized solutions. A point on the graph represents a cluster and a cluster represents like draws. The resulting plot shows demand on the X axis of the graph, and Design-Peak Day on the Y axis. This plot shows how the SENDOUT model met high or low demand during Design-Peak-Day events.

The Company then selected the clusters that most closely met the forecasted annual demand for the coming year. The Company examined the preferred draws that make up the clusters looking at the number of times a given package of gas was chosen and the volume of that package most often used.

The Company also reviewed the original packages in order to verify that the Company did not entrust too much of its purchased gas to one vendor, that peaking versus baseload contracts seemed reasonable, that packages were within the transportation limits of both KRGT and DEQP and verified that a cluster combined with cost-of-service, storage, and spot purchases would meet Design-Peak Day. Once this screening was completed, the most often used packages emerged from the RFP process and were then finalized with suppliers.

The levels of purchased-gas packages selected from the SENDOUT modeling process this year are shown in the Final Modeling Results section of this report. The median purchased-gas volumes from the Monte Carlo simulation for the upcoming gas-supply year are shown by month in Exhibits 13.53 to 13.64 along with each probability distribution. Individual packages of purchased-gas supplies for the normal case are shown for the first two plan years in Exhibits 13.85 and 13.88. Of the 13 companies submitting proposals this year, 6 had at least one package selected by the modeling process. The Company made commitments to purchase from the selected suppliers on April 26, 2018.

Price Stabilization

On May 31, 2001, the Utah Commission approved a Stipulation submitted May 1, 2001, in Docket Nos. 00-057-08 and 00-057-10 proposing that the Company use stabilization measures in conjunction with natural gas purchases during the winter months (October – March). Pursuant to the Stipulation, the Company hedged portions of its baseload winter natural gas portfolio.

In Wyoming Docket No. 30010-GP-01-62, the Company sought to include costs to reduce price volatility, like those that occurred during the winter of 2000-2001. In its October

30, 2001 Order, the Wyoming Commission approved the Company's request to include stabilization costs in the 191 Account. The Company does not engage in any speculative hedging transactions by limiting these price stabilization efforts to contracts that fix or cap prices for gas supplies that are contractually committed to the Company's system for delivery to end-use retail customers.

For the October 2017 - March 2018 time period, the Company did not hedge the price of any of its baseload purchased gas supplies because of the forecasted level of cost-of-service gas in the supply portfolio. Given the current forecast for cost-of-service production, the Company does not plan to enter into any fixed-price agreements designed to hedge the price of its baseload purchased gas supplies during the next IRP year, but may do so in the future.