

BEFORE THE NEBRASKA PUBLIC SERVICE COMMISSION

In the Matter of gas supply cost adjust-) Application No. NG-0071
ment schedules implemented by)
NorthWestern Corporation d/b/a) HEARING OFFICER ORDER
NorthWestern Energy, Sioux Falls, South) RELEASING PRUDENCY REPORT
Dakota, pursuant to Neb. Rev. Stat. sec.)
66-1854.) Entered: August 28, 2012
)

BY THE HEARING OFFICER:

On March 13, 2012, the Commission opened this docket on its own motion in order to receive and monitor filings regarding gas supply cost adjustment schedules filed by NorthWestern Corporation d/b/a NorthWestern Energy (NorthWestern), Sioux Falls, South Dakota, pursuant to Neb. Rev. Stat. § 66-1854. On August 22, 2012, the hearing officer entered an order releasing the accounting report and extending the deadlines for the release of the prudency report and for the filing of comments on the reports.

Pursuant to the August 28, 2012 order, the hearing officer releases that portion of the report by Commission consultants related to the prudency review of NorthWestern's gas supply costs. A copy of the prudency report is attached hereto as Appendix A and incorporated herein by this reference.

Parties shall file any comments regarding the accuracy of the Commission consultant reports on or before September 10, 2012.

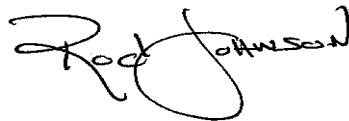
O R D E R

IT IS THEREFORE ORDERED by the hearing officer that the Commission Consultant report related to prudency attached hereto as Appendix A is released for comment by the Parties.

IT IS FURTHER ORDERED that the procedural schedule is amended as set forth herein.

MADE AND ENTERED at Lincoln, Nebraska, this 28TH day of August, 2012.

NEBRASKA PUBLIC SERVICE COMMISSION



By:

Rod Johnson
Hearing Officer

REVIEW

**GAS PURCHASING PRACTICES OF NORTHWESTERN ENERGY
for
RETAIL GAS SERVICES IN NEBRASKA**

prepared for
Nebraska Public Utilities Commission and Staff

prepared by
**Robert Camfield
Bruce Chapman
Mithuna Srinivasan
Christensen Associates Energy Consulting**

August 28, 2012

*(In the Matter of gas supply cost adjustment schedules implemented by
NorthWestern Corporation d/b/a NorthWestern Energy, Sioux Falls,
South Dakota, pursuant to Neb. Rev. Stat. sec. 66-1854.)*

1. INTRODUCTION

On March 13, 2012, the Nebraska Public Service Commission initiated Docket NG-0071 to review the gas supply cost adjustment (GSCA) of Northwestern Corporation's retail gas utility business in Nebraska, which is carried out by Northwestern's operations located in Sioux Falls, South Dakota, d/b/a Northwestern Energy (NWE, or Company). The Nebraska Commission Staff (Staff) has engaged Christensen Associates Energy Consulting (CA Energy Consulting) to conduct this review. Under contract with CA Energy Consulting, various aspects of the review have been carried out by Dively & Associates, the findings of which are contained in a parallel report to Staff.

This inquiry and resulting report are confined to the gas purchasing and hedging practices of Northwestern in support of its Nebraska gas utility business. NWE's gas supply operations are carried out in the Company's facilities in Huron, South Dakota, which engages in gas purchasing on behalf of the Company's retail gas operations in Nebraska and South Dakota. However, the two areas/jurisdictions are served by separate local distribution (and transmission) systems. The scope of the review is focused on the Company's hedging policy, guidelines and rules, procedures, and conceptual approach. To a large extent, the

informational basis for the review is NWE's responses to inquiries submitted to the Company by Staff, including data and information request sets 1–5. The review does not include a quantitative assessment of NWE's hedging strategies, though we gauge the general level of prices paid by NWE for commodity gas purchases, as well as the variability in wholesale gas purchase prices.

The report touches on gas purchasing hedging by U.S. gas distributors and retail markets in Section 2, *Market and Institutional Context*. Section 3, *NWE's Gas Purchasing Practices for Nebraska*, describes NWE's approach to gas price hedging, as gleaned from the materials provided. Section 4, *Conclusions*, provides recommendations for consideration by Staff.

2. MARKET AND INSTITUTIONAL CONTEXT¹

Gas supply and hedging, in the context of retail natural gas services provided by gas distribution utilities, can be described as the assessment, management, purchase, and sale of natural gas with the objective of obtaining and maintaining satisfactory and secure levels of supply while also reducing the variation in the prices of natural gas paid by retail consumers. Variation in the wholesale costs of purchased gas by local distributors can contribute significantly to the variation² and thus risks of retail bills paid by consumers.³ Because risk is costly, reduced price variation obtained through hedging practices provides net benefits to retail consumers.

As a matter of execution, gas price hedging can include long-term physical contracts at fixed prices and gas storage;⁴ as well as financial contracts, including a battery of mechanisms such as call options, forwards, futures, and forward-spot swap agreements. Many retail gas distributors (local distribution companies or LDCs) hedge gas price variation with fixed price

¹ Under the Municipal Natural Gas Regulation Act of 1987, Nebraska implemented the statutory framework to regulate the retail prices of natural gas service. Subsequently, Nebraska's State Natural Gas Regulation Act (2003) put in place regulation covering residential and commercial customers. The high-volume gas market in Nebraska is subject to open entry, and large natural gas consumers procure commodity gas competitively.

² Purchased gas adjustment clauses, common to retail gas tariffs, often hold constant the price for commodity gas over three to twelve months forward, thus mitigating the variation in daily and monthly wholesale prices of purchased gas.

³ Variation in retail gas bills of consumers is not simply a matter of the pass-through of gas price variation, as facilitated with purchase gas adjustment mechanisms. Rather, statistical variation in bills is attributable to both price and quantity variation, particularly where prices and quantities have fairly high positive correlation.

⁴ In addition, we note that NWE mentions physical swap agreements within its ERMP.

contracts for physical delivery over forward periods. The issue at hand is a matter of effectiveness: how well have the hedge mechanisms selected by gas distributors mitigated gas price risks?

3. NWE'S GAS PURCHASING PRACTICES FOR NEBRASKA

NWE provides retail electricity services in Montana and South Dakota, wholesale electricity sales (transmission, generation) in the northern tier of the western and midwest regions of the U.S., and retail gas markets in Montana, Nebraska, and South Dakota. NWE's Nebraska operations are served by the east-west portion of the Kinder Morgan Interstate Gas Transmission (KMIGT) and the Trailblazer (TBPL) pipelines that traverse the southern tier of the state of Nebraska.⁵ In terms of wholesale supply, both the sources of natural gas and pipeline services for NWE's Nebraska operations are separate and distinct from its South Dakota operations.⁶ However, the gas purchasing and scheduling activities (gas supply) for both the Nebraska and South Dakota operations are carried out at NWE's South Dakota/Nebraska Gas Supply Group, located in Huron, South Dakota.

The Nebraska/South Dakota gas supply activities are governed by, and subject to, NWE's internal risk management protocol, referred to as *Energy Risk Management Policy* (ERMP). NWE's ERMP protocol appears to follow an established approach adopted by many energy service providers, and covers well recognized and commonly included topics such as principles, governance and authority, controls and limits, assignment of responsibilities and accompanying accountability to specific positions, regulatory compliance and conflicts of interest, information security, credit risk, functionality, transaction execution, and provisions for record keeping. The ERMP incorporates explicit provisions for quality assurance including conformance to policy, and for the evolution of policy over time. In particular, NWE's ERMP includes a detailed description of its policy and operating approach regarding contracting and hedging of energy supply. Though general, Section 2 of NWE's ERMP is sufficiently transparent for a policy guideline, providing brief discussions of the market risk metrics that, potentially, may be applied by NWE to gauge energy supply risks. As described,

⁵ The communities of Alda, Grand Island, and North Platte are served by NWE off KMIG, while Kearney is served off Trailblazer.

⁶ At least in the absence of displacement.

the ERMP allows for the potential application of commonly recognized measures of risks associated with positions (contracts), including limit utilization, position measurement, mark-to-market and mark-to-model methods, and scenarios for assessing the risks attending macro economic events. The ERMP describes the identified risk measures as those metrics that might (i.e., potentially) be applied in lieu of measures that are implemented, as a matter of a directive to the various internal groups and functions assigned to carry out risk assessment and policy. The market risk metrics cited by NWE include price risks, basis risks, volatility risks, correlation risks, volumetric risks, and option risks (Section 2.3, page 23). The language captures the appropriate theme and, in our view, is sufficiently explicit for the purpose of a policy guideline, though it would seem to us that price risk would account for several of the identified risk dimensions including basis, volatility, and correlation risks. Perhaps that is implicit within Section 2.3 of the ERMP.

As a matter of operations, gas procurement cannot be readily separated from risk management. It is thus appropriate for NWE to incorporate or at least make mention of its general guidelines for supply strategies within the ERMP section focused on market risk management (Section 2.7). Several points are noteworthy. First, energy supply strategies implicitly embody various dimensions of risk including, as stated, price and volatility, counterparty credit risks, supply constraints, and other factors such as regulatory requirements. Second, NWE develops procurement plans for each jurisdictional area. Third, a portfolio approach is applied, which suggests that NWE is accounting for the covariance of potential outcomes across business units/jurisdictions.⁷

In brief, the ERMP constitutes an articulate, corporate guideline covering the execution and controls for energy risk management, providing a general idea about how NWE presumably approaches the problem of risk measurement. Yet, subject to approval by a higher authority, the specific mechanisms used by NWE to measure risk appear to be left to the broad discretion of the relevant position, Director of Energy Risk Management. As stated within the ERMP:

⁷ Conceptually, it would seem that a corporate-level portfolio approach could, through the process of risk mitigation, lead to the implementation of supply strategies which reduce overall business risks inherent to NWE overall, while simultaneously increasing the risks of gas prices and bills paid by retail gas consumers of NWE. This result is highly unlikely in view of the positive correlation across the prices of primary fuels.

The Energy Supply Board formalizes requirements for measuring market risk on an ongoing basis. Calculations are the responsibility of the Director of Energy Risk Management. The Director of Energy Risk Management, after consultation with the Director of Energy Supply Market Operations, will be responsible for recommending and documenting specific methodologies and parameters to the Energy Supply Board. Such parameters might include, but are not limited to, holding periods, confidence levels, stress test variables, and risk scenarios. Energy Supply Board approval should be made in writing to the Director of Energy Supply Market Operations and the Director of Energy Risk Management. The Energy Supply Board will review measures and metrics for assessing market risk as part of the Ongoing Assurance process. (Section 2.5.2, page 26.)

For NWE's Nebraska/South Dakota retail markets gas supply under the ERMP policy guideline is carried out and implemented by the Nebraska/South Dakota operations, as mentioned above. At an operational level, NWE's approach to gas supply for Nebraska (and South Dakota) is articulated in *South Dakota and Nebraska Natural Gas Procurement Strategy and Policy, 2012–2013*, hereafter be referred to the Gas Supply Plan (GSP). For Nebraska, NWE's four communities are served under capacity contracts with the KMIGT and TBPL pipelines, with reservations equal to 55,453 MCF and 14,000 MCF per day, respectively—a total of approximately 69,000 MCF maximum day throughput for the two pipelines.⁸

As with many LDCs, a major share of NWE's retail demand for gas service in Nebraska is space heating, which usually—though not always⁹—gives rise to significant seasonal sales patterns; for the 2012–13 season, projected monthly energy sales by NWE for its Nebraska markets vary from 144,715 MCF (July) to 958,175 MCF (January), with the maximum being 6.5 times the minimum. Gas storage is important; NWE maintains storage capacity under contract with KMIGT in the amount of 432,000 MCF cycle quantity, and 9,600 MCF maximum day withdrawal, thus representing about 15 percent of maximum pipeline throughput capability. Monthly storage injections range from 21,600 to 108,000 MCF (June–

⁸ The discussion will use MCF (one thousand cubic feet) notation, with the understanding that the underlying energy density closely approximates one thousand Btu per cubic foot. Materials provided by NWE in the immediate proceeding utilize MMBtu and Dth (dekatherm) notations.

⁹ For example, retail gas sales in northern Florida are likely to have significantly less seasonal variation than sales in Nebraska.

October), while withdrawals range from 12,960 to 95,040 MCF (November–May).¹⁰ The result is to significantly smooth out monthly purchase quantities, reducing the maximum variation (ratio of highest to lowest) to somewhat less than 4.5 times.

For its Nebraska markets, NWE purchases gas supply in the amount of approximately 5,490,000 MCF annually, delivered at three commercial hubs including Lakin Holcomb, CIG Weld, and CIG West End.¹¹ NWE indicates that approximately 70 percent of gas supply is procured under fixed price contracts (page 4, GSP).¹²

For Nebraska, NWE has adopted the well known dollar cost average approach for gas procurement.¹³ More accurately, NWE refers to its procurement approach as a layering method which, as described, appears to have an appropriate level of flexibility and limits in view of the substantial price variation inherent to natural gas markets, at least historically. As stated by NWE in its GSP:

In summary, the procurement approach will include purchasing portions of the total supply requirements at specific times or at specific target prices for the winter periods. This concept is referred to as “layering” of contracts. Layering of contracts provides the ability for NWE to assess market conditions and begin securing price stability while accommodating for lower market prices throughout the procurement period. If prices are believed to be advantageous, NWE will layer a larger percentage of total contracts. The objective is to provide average rate stability during the winter period.¹⁴

The challenge, of course, is implementation. To this end, NWE indicates that it has developed a systematic mechanism to monitor market conditions for the purpose of procuring

¹⁰ Not surprisingly, the injection quantities are greatest (108,000 MCF) during June–August, and the withdrawal quantities are greatest (86,800, 86,400, 95,040 in December–February. Reference NWE’s response to data and information request 1–8, *South Dakota And Nebraska Natural Gas Procurement Strategy and Policy, 2012–2013*.

¹¹ NWE states that, for the November 2010–October 2011 period, the delivery volumes are 570,000 MCF, 1,140,000 MCF, and 500,000 MCF for the Lakin, CIG Weld, and CIG West hubs, respectively. (Data Response to Data and Information Request NPSC-1-3, page 5)

¹² We note that commodity gas purchased under fixed price contracts for the most recent 12-month contract period is significantly less than 70 percent of total demand. This purchase strategy may be appropriate, depending on NWE’s assessment of market conditions.

¹³ Examples of the application of so-called dollar cost averaging by LDC’s for natural gas procurement include Avista Utilities, which states “...employs a strategy of layering in natural gas purchases overtime, similar to dollar cost averaging...”, cited in *Natural Gas Procurement Plan* featured on Avista’s Web site; and Integrys Energy, which mentions dollar cost average among its offerings of gas supply management services, referred to as *Natural Gas-Structured Procurement Strategy* and displayed on Integrys Energy’s Web site.

¹⁴ *South Dakota and Nebraska Natural Gas Procurement Strategy and Policy, 2012–2013*. p. 5

a share of the total gas supply requirements for Nebraska at fixed prices. The mechanism apparently involves software for monitoring market conditions, and is used to support NWE's procurement decisions over recent years; as implied by the ERMP, it is carried out by NWE's Nebraska/South Dakota gas supply staff.

Our interpretation is that NWE begins by defining the monthly share of total requirements over the cycle which should be obtained at fixed prices under forward commodity contracts between NWE and suppliers, for delivery at the commercial hubs identified above.

Procurement under fixed-price contracts proceeds under a general guideline which defines the range of accumulated percentages of the share of total supply to be obtained at fixed prices. The accumulated supply percentage range is specific to the months-ahead periods from the month that physical delivery would commence. The ranges for supply percentages are specific to the various months ahead, and are fairly broad in order to accommodate major changes in market conditions, as reflected in forward prices.

Carried out under this guideline, procurement decisions by NWE are based on an evaluation of market conditions. This second step, evaluation of conditions, determines an overall weighted price representing the contemporary view of market conditions, referred to as a target price. The target price is the weighted combination of a set of market indicators/factors.^{15, 16} The observed prices of contracts for forward strips covering the winter season—i.e., months November–March—is gauged with respect to the price obtained from the evaluation. The percentage difference (variance), either high or low, between the observed price of the forward strip and target price is calculated. The third step, determination of the accumulated percentage of the baseline quantity covered by fixed-price physical contracts, drives the purchase of fixed-price physical contracts. The accumulation

¹⁵ The set of market indicators incorporated within NWE's market condition evaluation include *36-month pipeline index average, 24-month pipeline index high, 24-month pipeline index low, 24-month pipeline index average, 12-month pipeline index high, 12-month pipeline index low, 12-month pipeline index average, 6-month NYMEX futures average, 3-month NYMEX futures average, and previous year blended average price*. Each of the first nine components carries a weight of 6 percent while the *previous year blended average price* component is weighted at 46 percent.

¹⁶ Seven of the identified factors are described as *pipeline indexes*, a terminology which we interpret to mean natural gas prices at relevant commercial hubs for pipeline systems in the region. We note that elsewhere the Company mentions it tracks gas prices at several price points including *ANR Oklahoma, NGPL MidContinent, PEPL TOK, Southern Star TOK, CIG Rockies, Rockies Cheyenne Hub, and NGPL Amarillo*.

percentage is specific to months ahead of the first delivery month (November), and is determined by the variance of the observed price of contracts from the target price. For example, for five months ahead—i.e., at five months prior to the first month of the November–March delivery period, if the observed market prices for November–March strip contracts reside within the range of 10–30 percent below the target price, no less than 25 percent of NWE’s baseline supply for Nebraska should be under contract.

The approach adopted by NWE follows the general structure of contract layering utilized by other LDCs, though there are undoubtedly major differences in both execution and parameterization across utilities.¹⁷ Our impression is that NWE’s policy and methods are plausible, providing a well-defined structure that appears to be quite flexible and thus accommodating of rapidly changing market conditions—i.e., changes in the expectations of the supply and demand for gas services—which often translate into significant near-term price variation and risk.

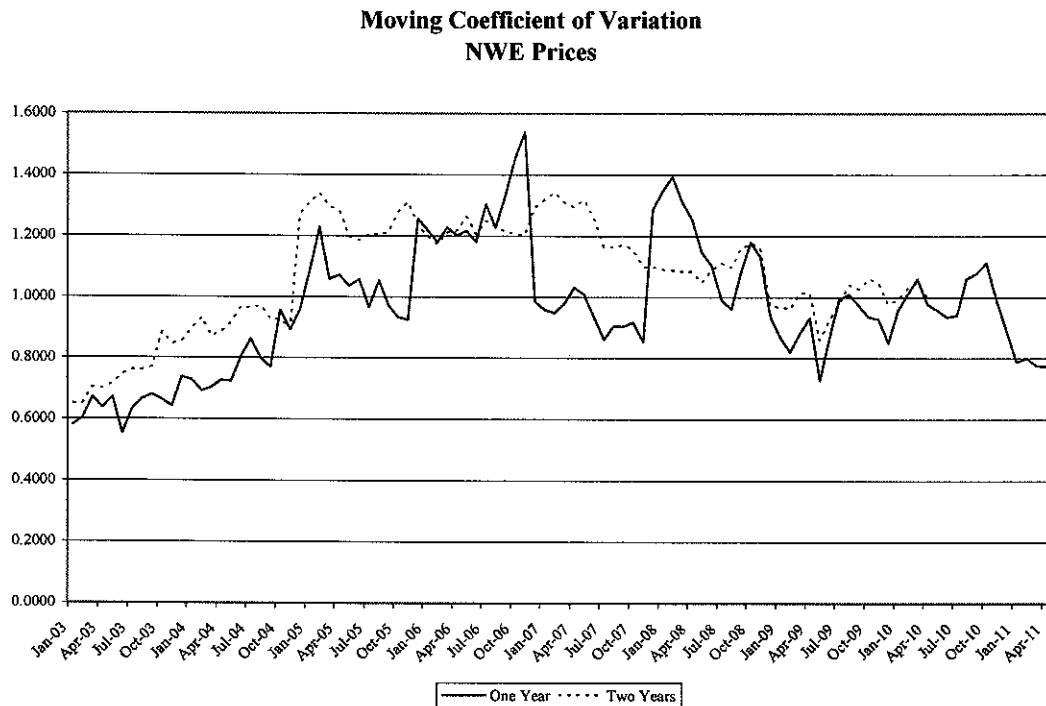
The effectiveness of NWE’s approach is less clear. Addressing this question, we compare the costs of gas for NWE for Nebraska with the widely observed prices of Henry Hub using the statistical metric known as the coefficient of variation (CV). The CV measure inherently normalizes the statistical variation in prices¹⁸ for differences in the price levels of commodity gas paid by NWE with respect to Henry Hub, and is necessary because of differences in the level of prices among commercial hubs.¹⁹ Within observed prices for the relevant hubs for NWE (CIG, Weld, and PEPL), we are unable to say whether or not the levels of prices are different systematically, because prices for the hubs were not available for this review. As shown in the graphs below, it appears that NWE prices, covering both fixed-price physical contracts and spot purchases are above Henry Hub spot prices. In addition, differences in

¹⁷ Differences in methodologies is alluded to in NWE’s GSP, where the procurement methods for fixed price contracting employed by neighboring LDCs including MidAmerican Energy, Source Gas, and City of Watertown are briefly mentioned (page 8, *South Dakota and Nebraska Natural Gas Procurement Strategy and Policy* or simply GSP).

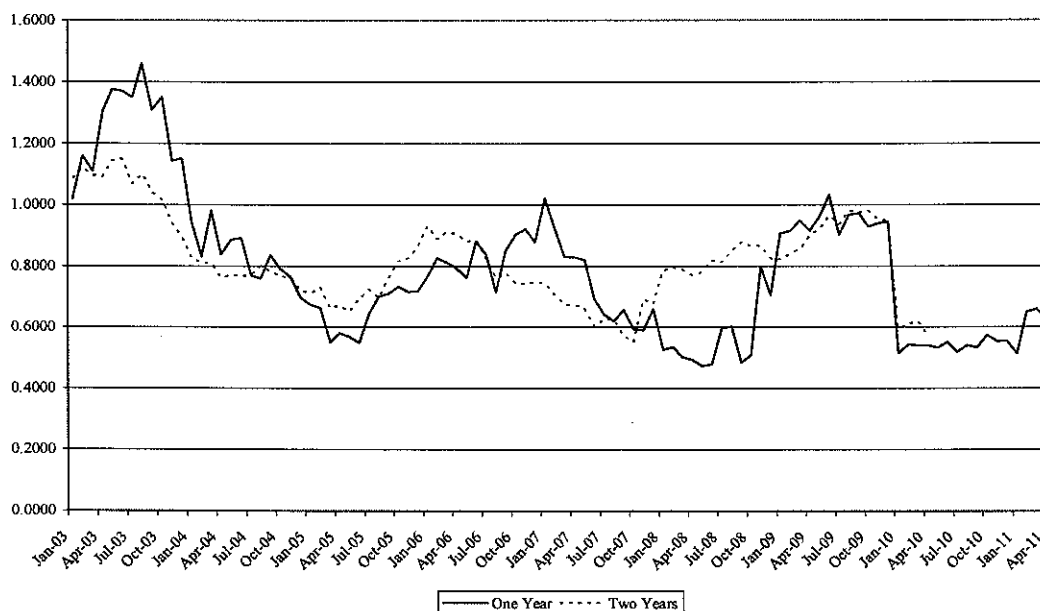
¹⁸ Note that the CV metric says nothing about differences in price level, and whether the level of prices paid for commodity gas by NWE are effective, gauged by some notion of *sufficiently least cost*.

¹⁹ We have correlated monthly city gate gas prices for various regions and states with Henry Hub and find, for most states, high correlation, recognizing that basis differences are driven by both transportation costs as well as the variance between prices at various commercial hubs and Henry Hub. For Nebraska, the correlation between city gate prices and Henry Hub is 0.94.

price level arise from forward prices being implicitly incorporated within NWE entries to its general ledger. As well, it appears that NWE prices are relatively more variable than the spot prices of Henry Hub. For rolling 12-month periods, the CV for NWE gas costs for Nebraska ranges from (approximately) 0.73 to 1.4 for the period 2005 forward. For Henry Hub spot prices, the similarly defined CV ranges from (approximately) 0.50 to 1.05.



**Moving Coefficient of Variation
U.S. Natural Gas Henry Hub Spot Prices**



While we find reason for concern regarding the effectiveness of NWE's Nebraska gas procurement practices, the question should be approached with considerable caution as a matter of regulatory review. First, NWE's Nebraska markets are small, positioned in south central Nebraska. Thus, the sensitivity of retail gas demands to weather cannot be readily diversified by NWE, when compared to larger gas systems covering wide areas.²⁰ As a consequence, it would seem appropriate for NWE to purchase a comparatively larger share of total supply at spot prices, other factors constant.²¹

Second, spot prices at the relevant commercial hubs for gas supply for Nebraska may have inherently greater variation than Henry Hub prices. Third, the small scale of NWE's

²⁰ The comparison is Henry Hub average monthly spot prices to NWE's average prices including fixed-price contracts for physical delivery plus spot prices. Thus, the data are not comparable. However, we would expect that NWE prices would have lower CV's with respect to Henry Hub spot prices, other factors constant.

²¹ As noted earlier, natural gas price differences are normally distributed. If the local demand for gas during winter is driven by weather patterns common to the nation or region, the expected increase in spot gas prices—e.g., rising demand because of cold weather—would not be systematically greater than the expected decrease in prices, should the demand for gas decline because of warmer temperatures.

Generally speaking, Henry Hub spot prices (daily, monthly averages) likely reflect significantly less variation in the seasonal demands for natural gas than the seasonality of the Nebraska retail demands facing NWE.

Nebraska operations may not allow for scale economies within gas contracts (quantity discount) and hedging. Additionally, because of the fairly small scale of operations, administrative costs may preclude NWE from conducting in-depth research in order to fully explore a range of alternative gas procurement strategies.

Third, it may be least cost for NWE to purchase from its supply hubs because, as a matter of proximity, doing so minimizes transportation costs. While we haven't compared NWE's transport costs to those of other LDCs we anticipate that NWE may need considerable capacity with respect to retail sales in view of large seasonal differences in demand. Finally, variation may not matter too much because of the nature of the PGA: prices are constant for 12-month periods.

4. CONCLUSIONS

The above review leads to the following recommendations for consideration by the Nebraska Commission Staff. First, NWE should provide a comparison of monthly commodity gas purchase prices for its Nebraska markets, to spot prices for the relevant commercial hubs (CIG, Weld, and PEPL) as well as other hubs that NWE tracks, for the period 2003–forward;²² alternatively, Christensen Associates Energy Consulting can perform such analysis on behalf of Staff. Second, NWE should provide a technical explanation describing the analysis that it uses in support of NWE's decision(s) to adopt its current approach to gas procurement in Nebraska, as discussed within NWE's response to NPSC Staff data and information request 8-1. We suggest that NWE's explanation should focus on the reasoning and analyses that underlie NWE's adoption of the current approach, demonstrating why its approach is preferred to other potential methods. In particular, NWE should provide analysis in support of matrices of parameters shown in the GSP.

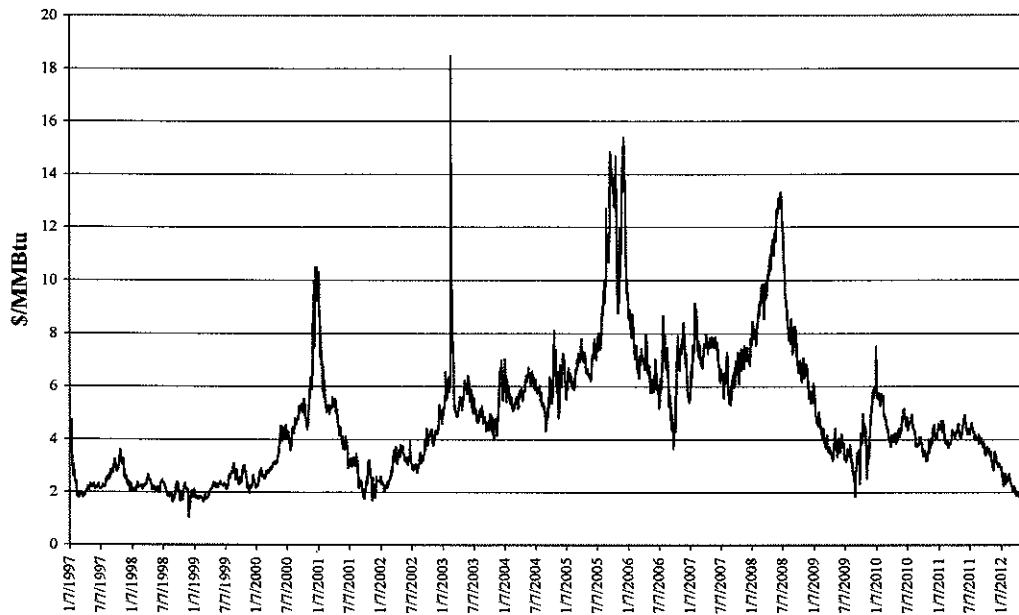
²² We find it useful to conduct a long-term historical review and perform backcast simulations to test alternative procurement strategies. Yet, a review of long-term historical gas prices suggests that price regimes may exist within natural gas wholesale prices. In fact, the period 2009 forward may represent the start of a new regime. Several emerging factors can be cited: lower long-term trajectory of the national economy, a surge in the supply of shale gas, and the potential retirement of older coal-fired generation.

APPENDIX

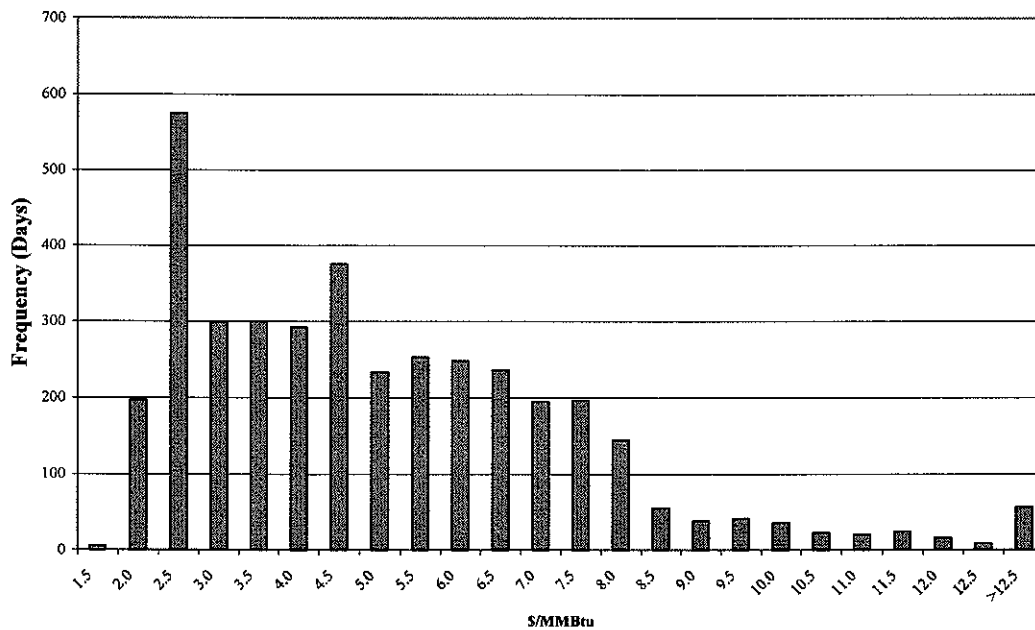
The graphs below provide historical context for natural gas prices, presented in various ways, as follows:

GRAPH 1: Daily Henry Hub Spot Prices: 1997-2012	13
GRAPH 2: Daily Henry Hub Spot Price Histogram: 1997-2012	13
GRAPH 3: Daily Henry Hub Spot Price Percentage Change Histogram: 1997-2012	14
GRAPH 4: Monthly NWE Prices: 2003-2012	14
GRAPH 5: Monthly Henry Hub Spot Prices: 1997-2012	15
GRAPH 6: Monthly Nebraska City Gate Prices: 1997-2012	15
GRAPH 7: Monthly NWE Price Histogram: 1997-2012	16
GRAPH 8: Monthly Henry Hub Spot Price Histogram: 1997-2012	16
GRAPH 9: Monthly Nebraska City Gate Histogram: 1997-2012	17
GRAPH 10: Monthly NWE Price Percentage Change Histogram: 1997-2012	17
GRAPH 11: Monthly Henry Hub Spot Price Percentage Change Histogram: 1997-2012	18
GRAPH 12: Monthly Nebraska City Gate Percentage Change Histogram: 1997-2012	18
GRAPH 13: Monthly Natural Gas Futures Prices	19
GRAPH 14: Moving Coefficient of Variation U.S. Natural Gas NYMEX Monthly Futures Price	19

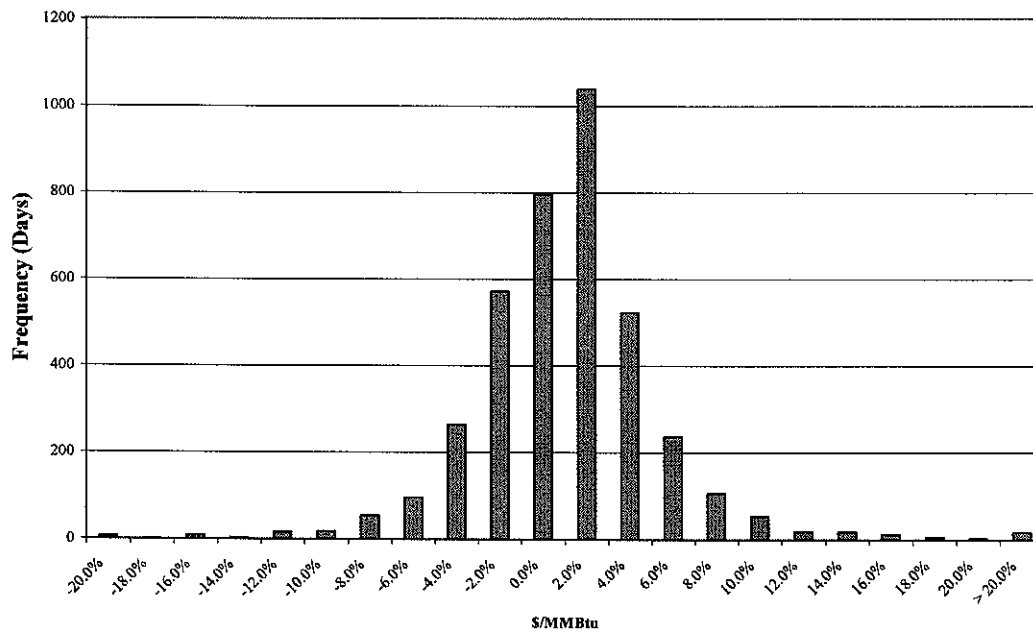
GRAPH 1: Daily Henry Hub Spot Prices: 1997–2012



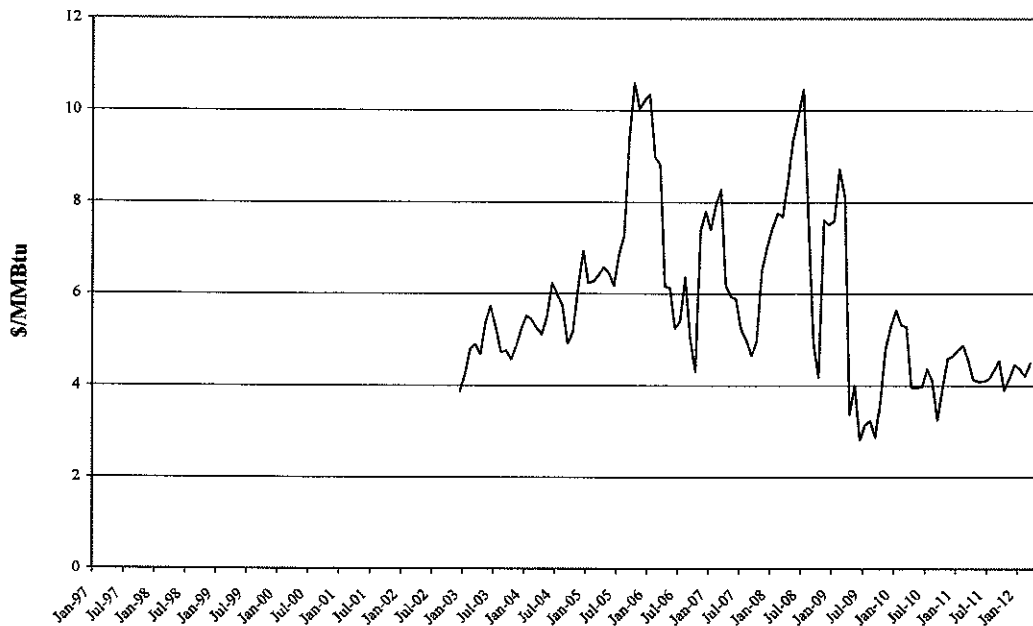
GRAPH 2: Daily Henry Hub Spot Price Histogram: 1997–2012



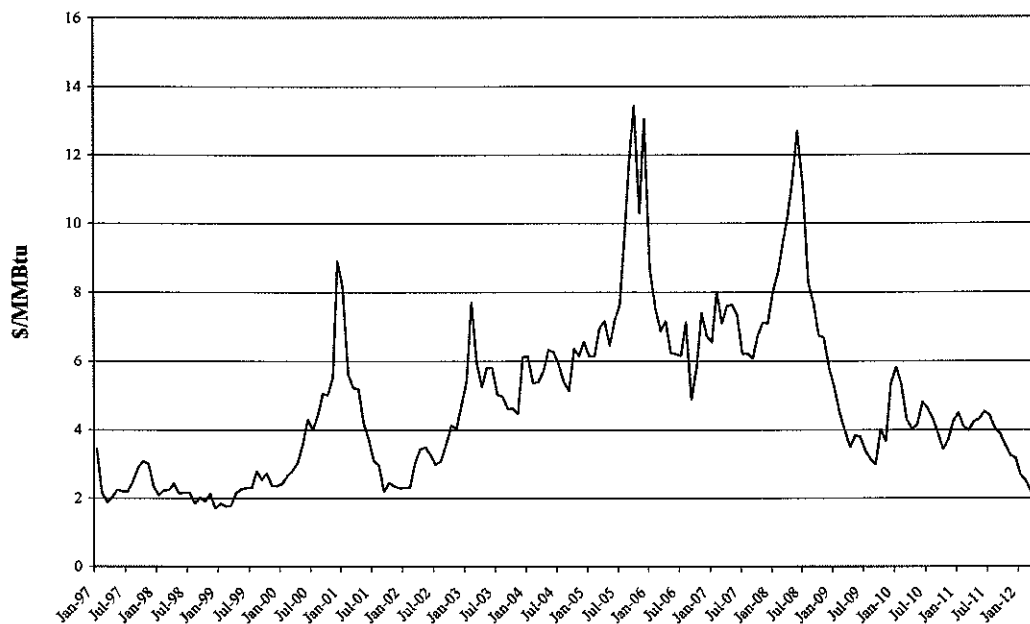
GRAPH 3: Daily Henry Hub Spot Price Percentage Change Histogram: 1997–2012



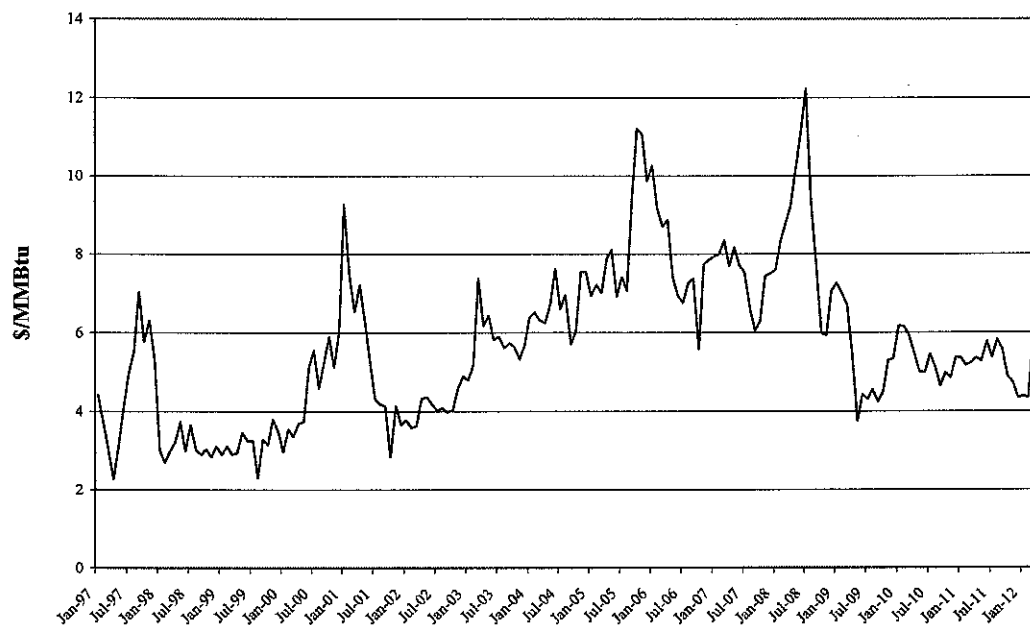
GRAPH 4: Monthly NWE Prices: 2003–2012



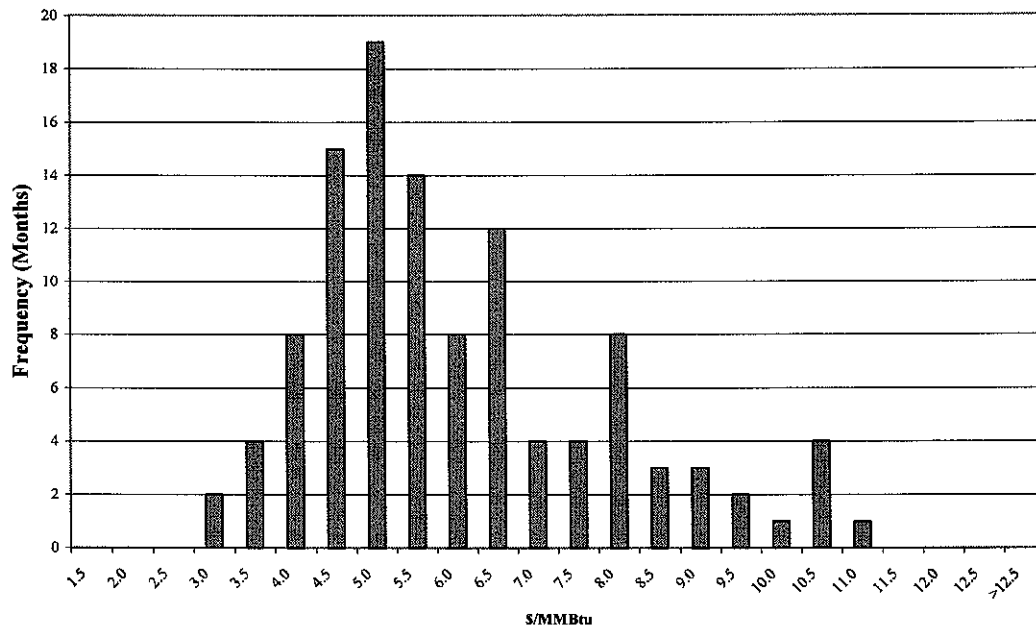
GRAPH 5: Monthly Henry Hub Spot Prices: 1997–2012



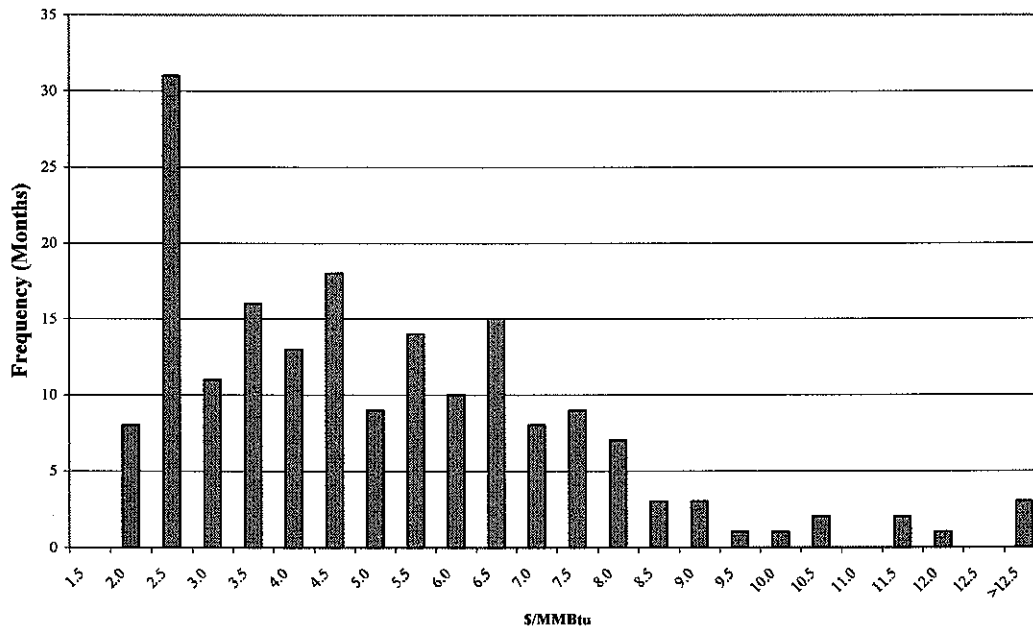
GRAPH 6: Monthly Nebraska City Gate Prices: 1997–2012



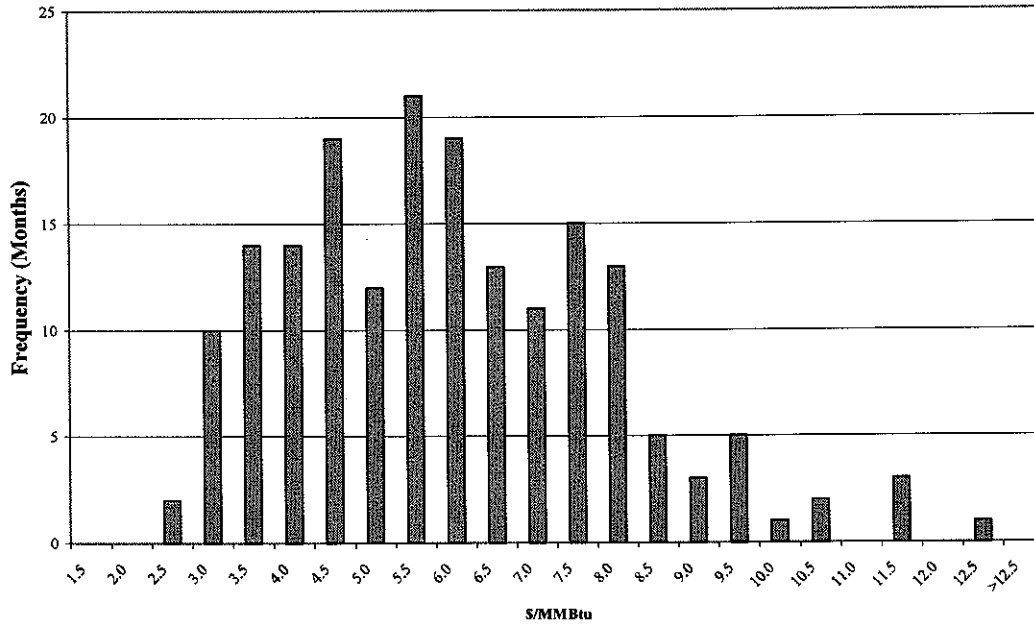
GRAPH 7: Monthly NWE Price Histogram: 1997–2012



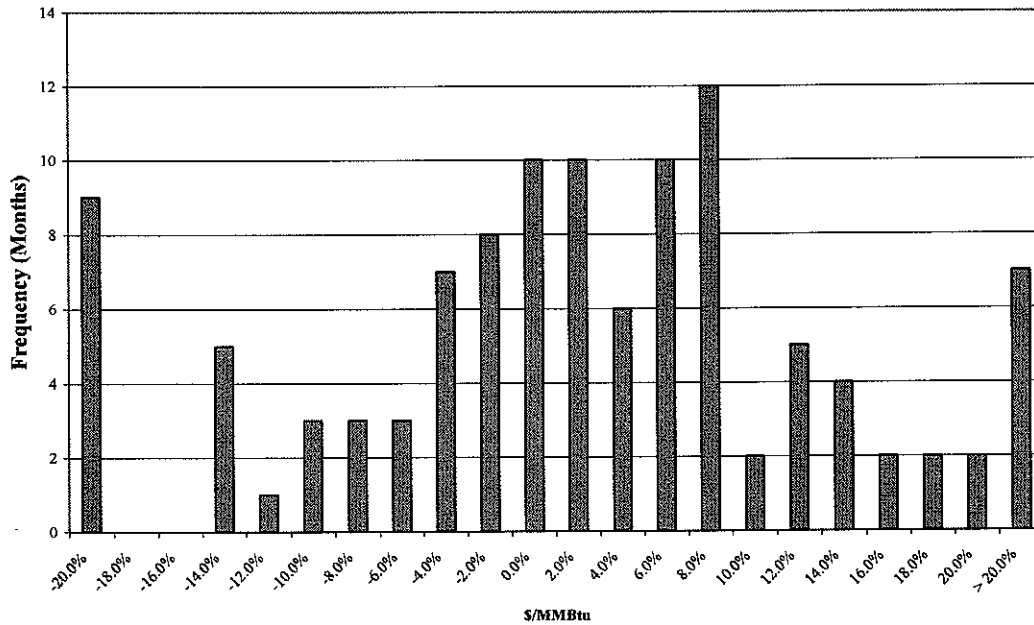
GRAPH 8: Monthly Henry Hub Spot Price Histogram: 1997–2012



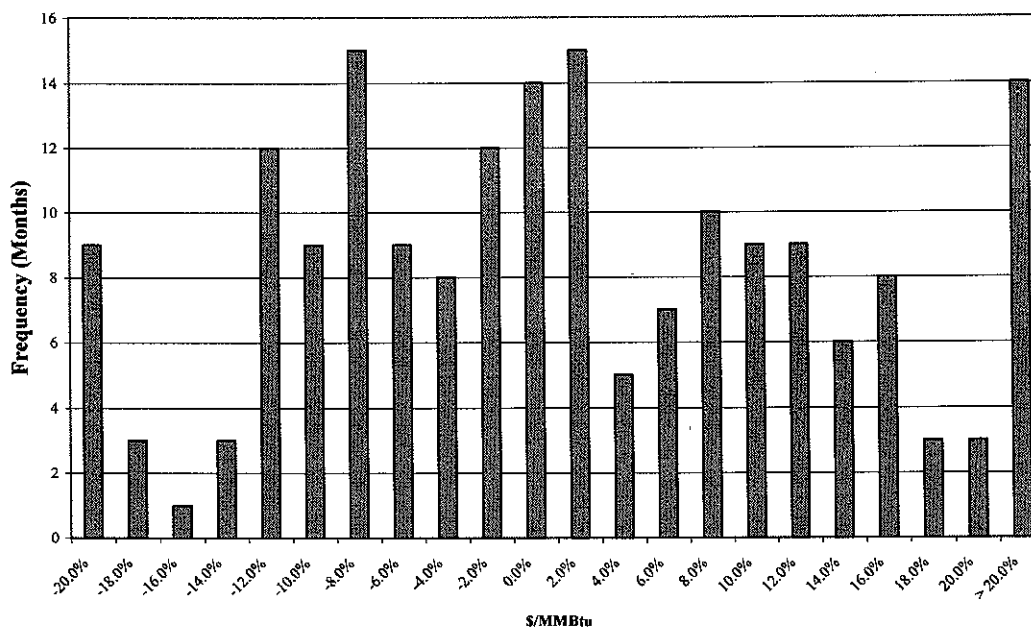
GRAPH 9: Monthly Nebraska City Gate Histogram: 1997–2012



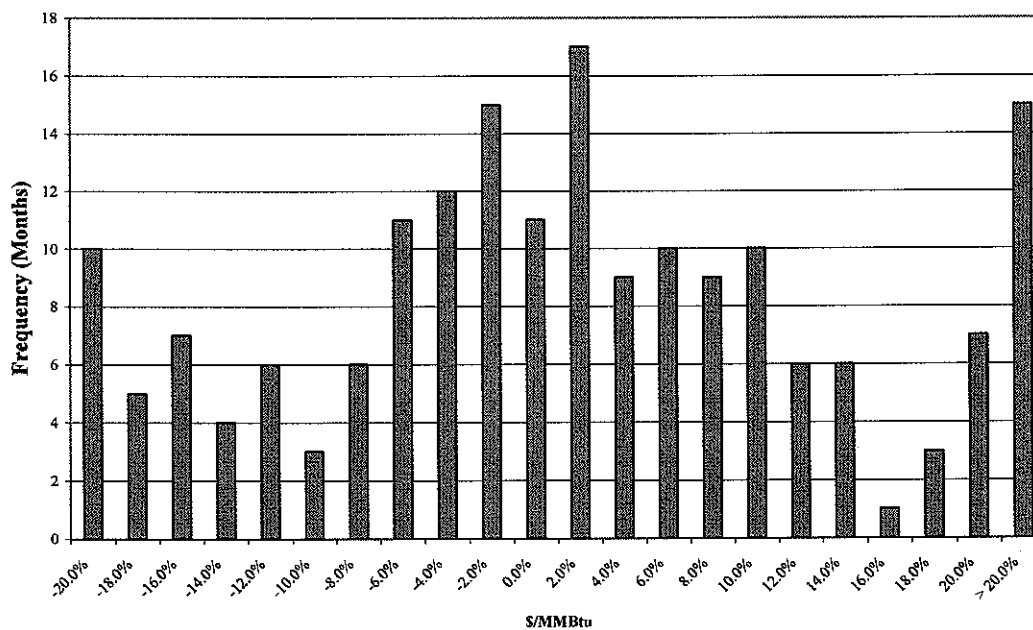
GRAPH 10: Monthly NWE Price Percentage Change Histogram: 1997–2012



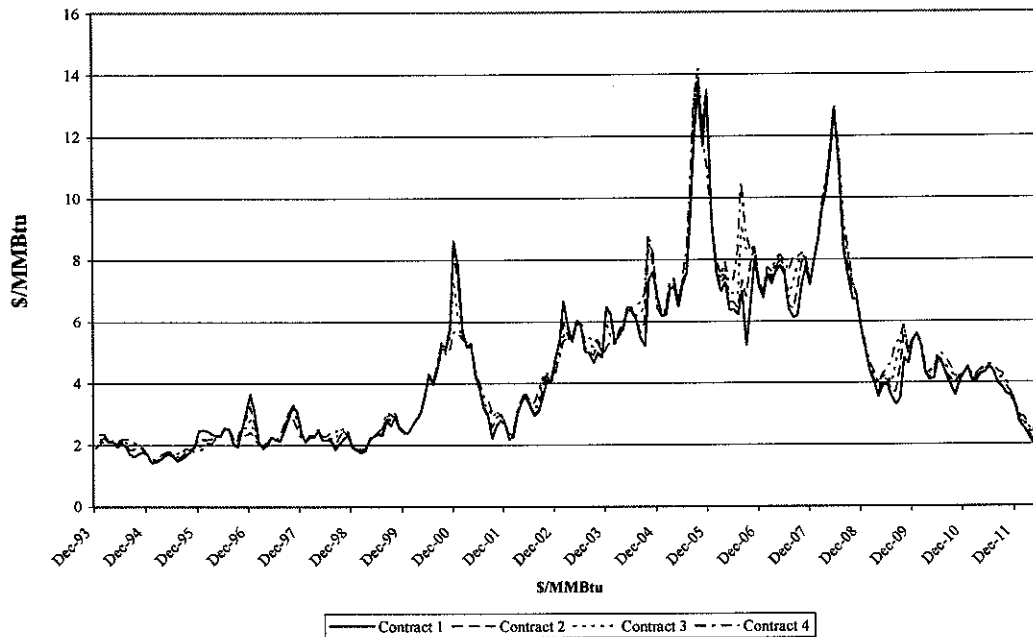
**GRAPH 11: Monthly Henry Hub Spot Price Percentage
Change Histogram: 1997–2012**



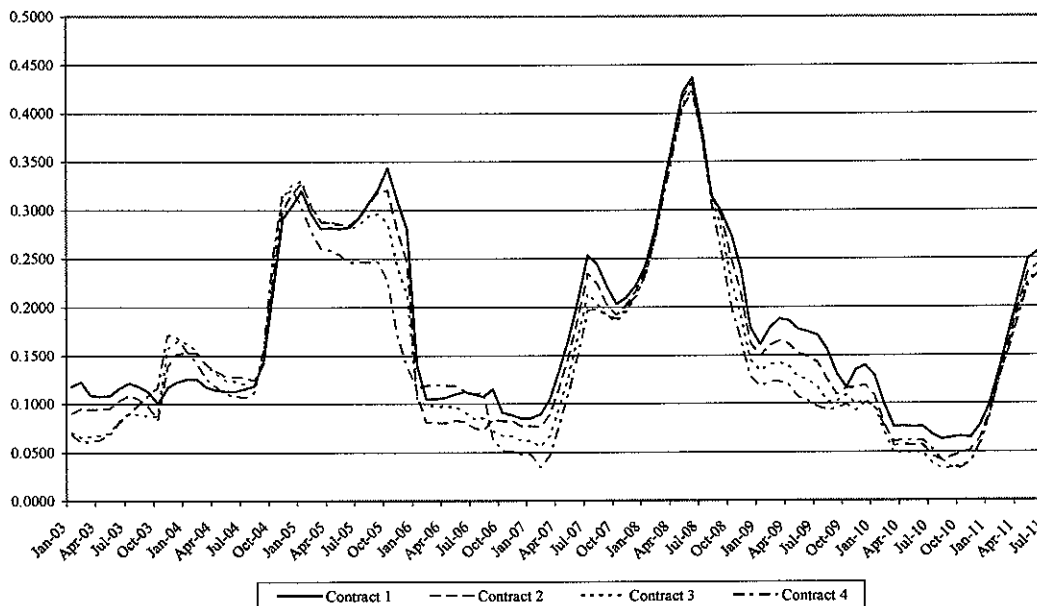
**GRAPH 12: Monthly Nebraska City Gate Percentage
Change Histogram: 1997–2012**



GRAPH 13: Monthly Natural Gas Futures Prices



**GRAPH 14: Moving Coefficient of Variation
U.S. Natural Gas NYMEX Monthly Futures Price**



Contract 1: A futures contract specifying the earliest delivery date. Natural gas contracts expire three business days prior to the first calendar day of the delivery month. Thus, the delivery month for Contract 1 is the calendar month following the trade date.

Contracts 2-4: Represent the successive delivery months following Contract 1.