

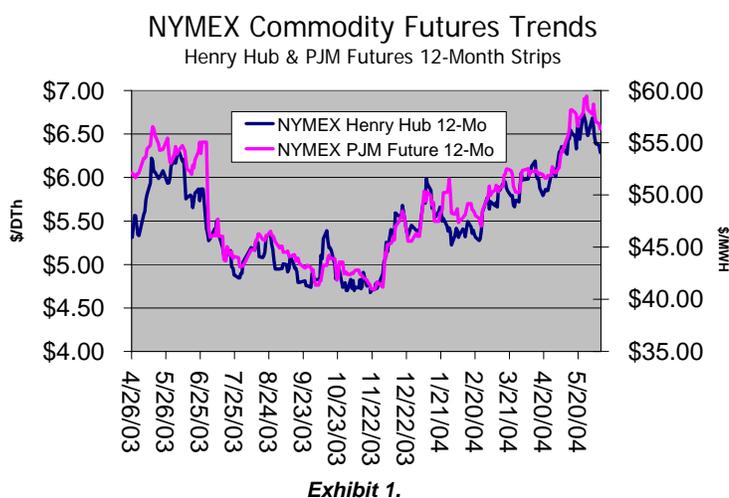


Natural Gas Price Trends and Practical Strategies For Managing Escalating Supply Costs

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I. Introduction

Owing to a variety of factors, natural gas prices have risen considerably over the past two years, and today are at historic average highs (*Exhibit 1*). Even companies that spend a small fraction of their energy budgets on natural gas are becoming increasingly alarmed by the recent run-up, and not just because of higher prices. Today's natural gas markets exhibit extreme volatility, and seem to be responding to new trends and interrelationships that make it difficult to rely on conventional wisdom and past experience when trying to establish and follow an effective energy supply management strategy. Adding to concerns, natural gas and electricity prices are more linked to one another than ever.



The key questions facing energy buyers and managers are:

1. What are gas prices likely to do, both in the near term and over the current business-planning period (the next two years), during which buyers must establish and meet budget goals?
2. What energy procurement strategy can be adopted to limit gas price impact, establish and meet budgets, balance risks, and match business strategy?
3. Are there competitive market opportunities and/or supply alternatives that can support that energy procurement strategy? In which markets and for what types of facilities are they available? How can buyers weigh the relative benefit and risk of a competitive supply alternative versus remaining with local delivery company default service?
4. And finally, what actions can be taken, sooner rather than later, to maximize the opportunity to reduce or contain natural gas costs while balancing the risks and uncertainty?

This paper addresses those questions and offers suggestions as to what can be done now, depending on a company's business strategy and risk profile.

II. The Experts' Views of Natural Gas Price Trends

On June 29, 2004, EnergyWindow and Platts Research teamed to present a 90-minute, Web-based seminar to probe the issues surrounding natural gas pricing and to give end-users of natural gas and electricity a better basis upon which to make buying decisions going forward.

Three panelists, offering a wide range of perspectives on the future of natural gas prices, participated. These were Andrew Weissman of EnergyBusinessWatch.com, Dr. John Wood from DOE/EIA, and Dr. Thomas Woods, Platts Senior Research Analyst. Following are executive summaries of their individual presentations (in the order in which they were presented) and the issues each presenter feels represent the primary influences on gas prices.

A. Andy Weissman, EnergyBusinessWatch.com

Andy Weissman's presentation painted a very bullish scenario for energy prices, going forward. He predicted that gas prices could reach \$8 to \$10 in the next 30 to 60 days, with electricity prices doubling within the same timeframe. Weissman focused on several supply-and-demand related issues to support his position, and said that the coming price shocks will be "caused by the collision of two tectonic plates set in motion long ago," namely:

1. A reduction in natural gas production

Until recently, natural gas supplies were perceived as plentiful. According to Weissman, however, production from most conventional on-shore fields in the U.S., Alberta and the Near-Shelf region in the Gulf has either hit a plateau or entered into a period of rapid and irreversible decline. Production from major sources in the U.S. and Canada began to hit a wall in the 2000-2001 timeframe. To support his position, Weissman pointed to the new National Petroleum Council study prepared for Secretary of Energy, Spencer Abraham, that suggested that, at best, increases in the Rockies and from Deepwater projects in Gulf of Mexico will offset declines in other basins.

2. The shift to natural gas as the near-exclusive fuel to meet incremental electricity needs of the U.S. economy

Prior to the late 1990s, it was possible to meet the incremental electricity needs of the U.S. economy primarily through increased utilization of existing coal and nuclear units. According to Weissman, though, this capacity was exhausted by the late '90s, resulting in \$100 billion in investment in new gas-fired plants. Consequently, from 1999 to 2004, gas-fired generation in use and under construction increased by 215,000 MW and from representing 25% of the nation's electric generation capacity to 40%.

Weissman went on to warn of a particularly severe crisis this summer, with electricity demand growing at a far greater rate than expected. He pointed out that even small increases in spot market demand for natural gas tend to result in steep increases in the electricity spot market prices. Other factors that could cause much higher natural gas prices are hotter than normal weather or gulf storms, plant outages, further accelerated growth in the economy, below normal hydro availability in the West, and regulatory impacts. Weissman cited a minimum of 7 to 10 years before the natural gas supply gap can be narrowed significantly, and called for urgent, high-level coordinated action by both Federal and State governments.

B. John Wood, Department of Energy, Energy Information Agency

John Wood painted a generally more optimistic picture than Andy Weissman did, regarding the potential for serious and sustained dislocations between natural gas supply and demand. Even so, the Energy Information Agency's (EIA) base case projections of natural gas spot prices through September '05 show prices well above \$6.00/MCF until January '05, then dipping into the high \$5.00 range until May '05 then above \$6.00 again after that (*Exhibit 2*). A 95% Confidence Interval reveals those prices could range between the high \$3.00s to well over \$10.00/MCF.

In terms of production and working wells, EIA data for the period May '04 through September '05, shows average active rigs remaining at or near 1,000, and new gas well completions rising from about 1,200 in January '02 to a sustained level of better than 2,000 for the period of 5/04-9/05. Working Gas in Storage numbers are projected to remain above the 5-year average. EIA demand numbers from 2004 to 2005 show a 1% or less growth rate.

Wood explained that one of the most important issues facing the U.S. natural gas market is whether natural gas production will rise to meet expected growth in demand and replenish natural gas storage levels. Predicting supply response resulting from increased drilling, however, is fraught with uncertainty. Natural gas production data typically does not become available until several months after the fact. In addition, storage level data tends to be revised upward over time.

Another important factor impacting prices is the ratio of the actual amount of production to the maximum amount of production capacity available from natural gas wells, known as the effective capacity utilization rate. This number is and has been at 90% or better since 1999. Wood noted that gas prices become extremely volatile and potentially much higher as effective capacity utilization rates rise above 90%.

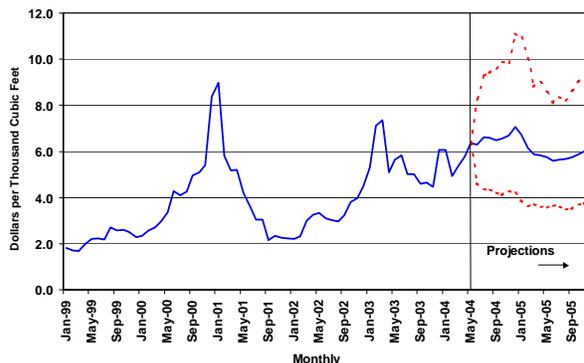
C. Dr. Thomas Woods, Platts Senior Research Analyst

Dr. Woods began by saying that gas prices have more than tripled since the mid-1990s, but asserted that there has been no real sustained growth in demand for over a decade, and that this trend will continue for at least a decade. Despite this, the perception is that demand will spike dramatically, thus producing uncertainty in the markets.

Dr. Woods pointed out that natural gas supply is adequate for annual demand, but not for monthly up-ticks. This tightness is a major contributing factor to gas price surges and upward price ratcheting. One reason for this is that we have inadequate surplus levels. Dr. Woods pointed to the need to maintain surpluses above 1 Bcf/day, so as to accommodate monthly volume swings and singular supply disruptions (unplanned outages, weather, etc.), thereby avoiding significant price increases. He said that sustained price relief is uncertain until the tight monthly gas supply situation eases.

In terms of the outlook for storage, he observed that current injection rates (through the third week of June 2004) were more than adequate to replace 2003 levels – so much so, that he predicts third quarter 2004 demand for North American storage injection will fall by 3 Bcf/d from previous 9-week levels (*Exhibit 3*).

U.S. Natural Gas Spot Prices
(Base Case and 95% Confidence Interval*)



*The confidence intervals show +/- 2 standard errors based on the properties of the model. The ranges do not include the effects of major supply disruptions.
Sources: History: Natural Gas Week; Projections: Short-Term Energy Outlook, June 2004.



Exhibit 2.

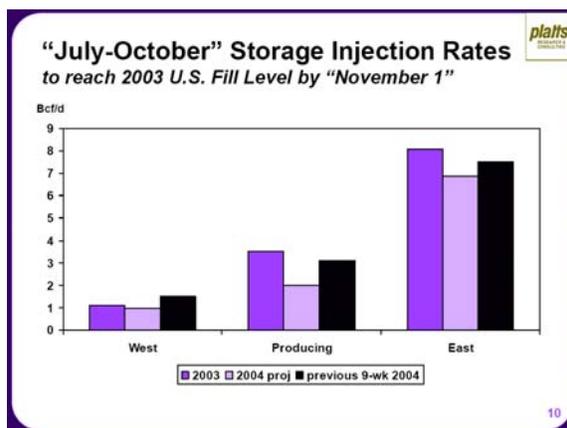


Exhibit 3.

Dr. Woods' view differed from that of analysts like Andy Weissman in that he believes that production numbers are actually responding to lower demand, rather than pointing to diminishing reserves or lower productivity. He cited several factors that contribute to easing demand, including:

- Baseload generation can absorb some of the demand for gas-fired generation through increased output of existing or expanding nuclear, coal and hydro resources.
- Improving heat rates of gas central generating stations – from over 10,000 BTU/kWh average in 1990 to less than 8,500 today – means that natural gas demand for electricity generation can be offset by more than 15% through use of these more efficient units.

According to Dr. Woods, conditions point to the prospect of limited growth or even a possible decline in near-term demand for North American gas production. Unfortunately, in his view, near-term *perceptions* of tight gas supply will continue to fuel higher prices.

III. Conclusions from the Experts

Among the panelists and in the industry at large, there seems to be general agreement that:

- Natural Gas Prices are driven primarily by supply and demand and, despite different conclusions about the drivers behind each; supplies are tight enough to support higher prices for at least the next year or two.
- The emergence of natural gas as the predominant fuel for the generation of electricity is and will be a major factor influencing the cost of both natural gas and electricity.
- The data from which analysts stake a position is inconsistent and subject to frequent revision
- The movement of a percent or two in the capacity utilization rate is enough to move gas prices a couple of dollars or more in the current atmosphere.
- A variety of external factors can tip prices in one direction or the other (hurricanes, hot weather, economic strength, geopolitical events, crude oil prices, etc.); there is significant upside potential for gas prices and limited downside opportunity compared to historical prices.
- Demand for natural gas is relatively inelastic in the short term, and significant increases in production capacity will take time to achieve.
- Any fundamental improvement in production capacity will come some years hence, through opening of new areas for development, LNG handling capabilities and new technologies.
- There is considerable complexity in predicting prices and abundant opportunity for highly informed and well-intentioned experts to disagree.

IV. Current Market Observations

EIA's July Short-term Energy Outlook calls for gas to remain at about \$6.30/MCF for 2004 and at the \$6.00/MCF range for 2005. This is supported by looking at the NYMEX Henry Hub futures, whose prices through 2005 averaged about \$6.17 on July 14, 2004. NYMEX futures prices, however, are lower as the months go out – a situation known as backwardation (*Exhibit 4*). Thus, the financial community seems to believe that gas prices will ease somewhat over the course of the next few years, with prices of \$5.19 and \$4.90 for the years 2007 and 2008, respectively. The further into the future we look at the NYMEX commodity, however, the less it is currently being traded and thus its value as an indicator of actual future prices is diminished, but the short-term expectation for gas prices is clearly downward.

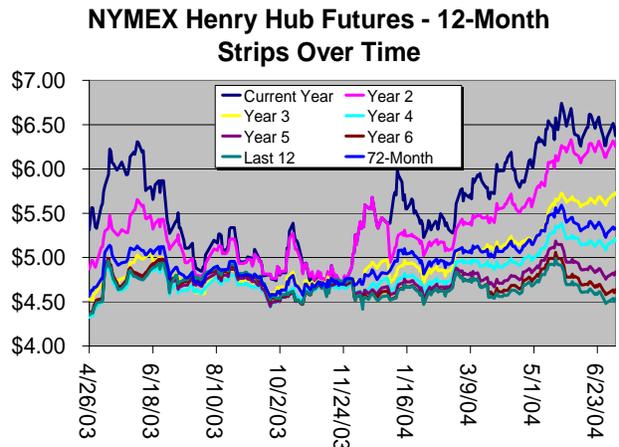


Exhibit 4.

Henry Hub Settle Prices over the course of its fourteen-year history have increased an average of \$.35/MCF per year. If that trend were to continue, we would see \$6.29 gas in 2005 and \$6.83 gas in 2006, making a purchase through year-end 2006 at \$6.04 (as the futures market illustrated in *Exhibit 5* would imply) look like a relatively attractive option.

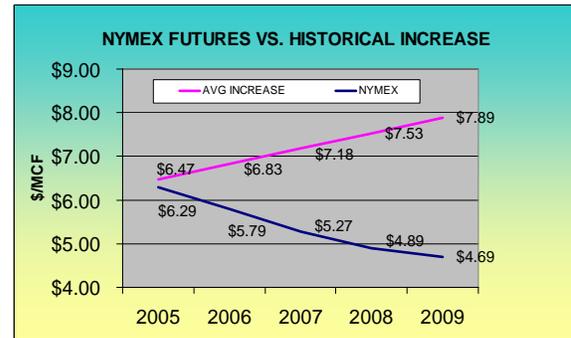


Exhibit 5.

When the aforementioned panel of experts was asked if, given the backwardation in the market, they would lock in a two-year price for natural gas now, Andy Weissman responded with an unequivocal “yes.” Dr.

Woods indicated he would consider buying before the second quarter production numbers came out (in early September), as they are likely to be misinterpreted and lead to a consequent rise in prices.

V. Business End-User Strategies

A. Considerations

Given the above, end-users wishing to support their energy purchasing decisions need to consider several factors in developing a strategy in response to gas price trends and market uncertainties:

1. Risk Tolerance

Small changes in production data can produce extreme changes in pricing at the current effective capacity utilization rates. While “riding the market” can produce savings, end-users need to weigh the benefits against the relative value of predictability as an attribute when seeking a contract for natural gas.

2. Cost of Inertia

Utility natural gas costs tend to reflect the wholesale market over time, generally with a lag time for price increases or reductions to be reflected via approved pricing formulas. End-users, therefore, that continue

on a default local distribution company (LDC) gas supply rate will be exposed to virtually 100% of the market risk, albeit with some time delay.

3. Contract Term

The length of time to which a company is willing to commit (and suppliers to bid on) varies. Even though natural gas futures are backwardated, most suppliers balk at signing up all but the largest customers for contract terms greater than two years. In any case, based on current backwardated futures prices, the lowest fixed price contract would be for the longest available term. The question for buyers is whether this is the best time for their company to buy a fixed price contract.

4. Product

Buyers should choose products that make the most sense for them. Generally speaking, the smaller the account, the less likely gas suppliers will be interested in serving them or in providing alternatives to fixed price products and/or to providing a high level of service (including informing end-users about what the markets are doing and when it might be appropriate to fix the commodity price).

5. Diversification

Large end-users (>5,000 MCF/Month) can diversify their risk by fixing a portion of their gas load and allowing the remainder to continue to "ride the market." Those with smaller multiple sites can consider fixing their prices in different areas at different times, as well as seeking variety in both suppliers and contract expiration dates as a means to diversify their risk. Since a number of markets remain regulated (with the result that gas costs are subject to market and regulatory dependencies), buyers may want to place some portion of their load with competitive suppliers, some at fixed prices, and others with variable pricing.

B. Product Types and Features

Some basics on available price/product options might be helpful.

1. Fixed Price

The supplier provides a fixed price for the term of the contract. The advantage of this product is that buyers can set and meet budgets with confidence. The disadvantage is that the price may be set at the wrong time, and buyers may find that they could have paid a lot less.

2. Variable (Indexed) Price

The price paid each month is equal to a specified published index plus a basis, generally the cost of moving gas from a recognized hub to the city gate plus a margin and administrative costs.^{*} With this approach, the risk that buyers will pay too much or too little relative to wholesale prices is minimized. Prices vary monthly, however, are difficult to predict, and require budget flexibility on at least a monthly or quarterly basis.

3. "Trigger" Option

Suppliers will often provide, with variable price contracts, the option to fix the price for all or a portion of the remaining contract term, based on the current futures prices. In some cases, this is a one-time conversion option; in others, it can be exercised flexibly for various future periods within the contract term. Some suppliers charge a premium for the conversion, particularly for smaller size contracts.

4. LDC Default Supply Service

The local distribution company establishes a price monthly or quarterly based on historical or future prices using a methodology and process approved by the public utility commission (PUC). Current and historical values can usually be found on utility or PUC web sites. In effect, this approach is a variable price

^{*} Variations of the components and terminology for this adder vary among regions and suppliers

approach, with the possibility of some time delay and additional risk associated with the regulatory process.

5. **Guaranteed Savings**

The supplier provides gas at a fixed price or percentage discount relative to the LDC monthly default price. This approach, if available, can reduce costs relative to the LDC default rate, but otherwise has all the attributes of LDC default and other variable pricing. It may be the safest option relative to the “do-nothing” option of continuing LDC default service if the buyer’s major concern is avoiding second-guessing.

6. **Financial Hedge**

An increasing number of suppliers are offering financial products that allow retail buyers to hedge prices for quantities of gas supplied across multiple jurisdictions. This product enables companies with smaller facilities, which are otherwise ineligible to transport gas or arrange for competitive supply, to limit the impact of rising gas prices. Buyers pay a premium for the ability to limit the risk of higher prices.

C. **LDC Default versus Competitive Supplier Service**

A key issue is how to determine whether remaining with the LDC default service rate or going with a competitive supplier will yield better results. The default service involves both variability and uncertainty because rates are usually not set for more than 1 to 3 months in advance. If budget risk tolerance is low (meeting established budgets is imperative), a fixed price with a competitive supplier is the best option, when available. Unless buyers have exceptional timing, though, they may pay more than necessary.

Those interested in getting the lowest price and willing to accept some variability should weigh the option of a variable price contract versus the LDC default service rate. Evaluation of the two requires some simple analysis. *Exhibit 6* provides an example of facilities served by Columbia Gas of Ohio (CGOH). It contains the monthly values for CGOH default gas costs and corresponding NYMEX Henry Hub (HH) monthly settle prices (one frequently-used index for variable price contracts).

\$/m m BTU	NYMEX Monthly Settle	CGOH Gas Cost	Difference "Basis "
May-03	\$ 5.12	\$ 9.61	\$ 4.49
Jun-03	\$ 5.95	\$ 9.61	\$ 3.67
Jul-03	\$ 5.29	\$ 9.61	\$ 4.32
Aug-03	\$ 4.68	\$ 7.23	\$ 2.55
Sep-03	\$ 4.93	\$ 7.23	\$ 2.31
Oct-03	\$ 4.43	\$ 7.23	\$ 2.80
Nov-03	\$ 4.46	\$ 6.90	\$ 2.44
Dec-03	\$ 4.86	\$ 6.90	\$ 2.04
Jan-04	\$ 6.15	\$ 6.90	\$ 0.75
Feb-04	\$ 5.78	\$ 7.23	\$ 1.46
Mar-04	\$ 5.15	\$ 7.23	\$ 2.08
Apr-04	\$ 5.37	\$ 7.23	\$ 1.87
	Mean		\$ 2.56
	Standard Deviation		\$ 1.11
	70% Confidence Level		\$ 1.96
	Expected Savings		\$ 0.60

Exhibit 6.

With a few assumptions and some statistical analysis¹, the mean, standard deviation, and various confidence levels for the contract basis value at which an indexed price is likely to produce savings relative to the LDC default rate can be calculated. In this example, if a buyer can obtain a variable priced contract indexed to NYMEX HH monthly settle price and a basis of \$1.79, the expected value of the savings is $\$2.56 - 1.96 = \0.60 / mmBTU with 70% confidence that the savings will be positive in any specific month.

¹ Some key assumptions and approaches were used in this analysis to simplify the illustration: the distribution is random; the mean is stationary; the sample size (12 months) contains whole cycles of any cyclic variations. The Student's T Distribution with 11 (12-1) degrees of freedom was used for the statistical analysis since the sample size is relatively small. More rigorous treatment of non-random trends and a larger sample size could be used.

Using these calculations, a buyer can determine whether to accept a basis bid from a supplier if the bid produces some minimum expected savings and confidence that the savings will not be negative in any month. The thresholds set by the buyer will impact the likelihood of getting bids that meet those thresholds. The option to trigger or convert to a fixed price brings additional value to the competitive supplier variable price contract in that it may be executed more quickly (typically a phone call) than the process of soliciting bids, negotiating agreements, and switching supply from the LDC default service when future prices turn favorable.

D. Strategies

Based on the issues and products described above, buyers can select a gas procurement strategy consistent with their business objectives. *Exhibit 7* illustrates some “pure” strategies.

Note: Most businesses will want to take a balanced approach and diversify the mix of products, contract termination date, and suppliers (competitive and regulated). Only default LDC service will be available for facilities in regulated or inactive markets, so buyers are advised to consider placing a portion of the load with competitive suppliers.

Business Strategy	Energy Supply Strategy
Set and meet budgets at all costs Ensure consistent financial performance	Fixed price
Minimize costs on an annual basis accepting some monthly or quarterly variation	Variable price
Maintain flexibility to take some risk and take advantage of market opportunities	Variable price with trigger option
Limit the impact of price increases for multiple facilities across physical boundaries	Financial hedge
Minimize effort	LDC Default Service
Balance risk and cost reduction	Diversified mix of products

Exhibit 7.

VI. Current Opportunities

Some gas utilities offer discounts or tax benefits for customers that switch, but some also limit the ability to return to tariff by requiring long notification periods, enforcing minimum stay requirements, or adding charges to returning customers. The map below (*Exhibit 8*) is borrowed from the EnergyWindow[®] Focus![™] Competitive Market Knowledgebase and shows general activity levels of retail gas sales for most classes of commercial and industrial accounts.

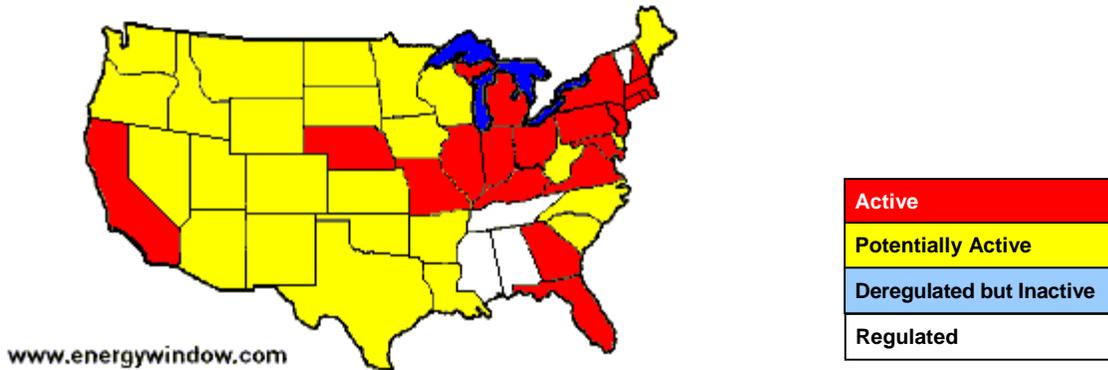


Exhibit 8.

The map reveals that active competitive markets exist in most states, in particular the more highly populated, industrial states; but two additional considerations must be used to determine whether a business’s facilities are eligible for or likely to obtain competitive supply agreements. The first is whether state regulations and local utility rules allow transportation for certain sized facilities. In Ohio, smaller customers (less than 2,500 Decatherms per year in Columbia Gas territory, for example) are referred to as “Choice” customers and are ineligible for gas transportation, although some fixed rate alternatives may exist. The second consideration, whether competitive suppliers will exhibit interest in supplying an account, is even more critical. Some suppliers focus only on the largest customers. Others may specialize in smaller customers or be willing to consider aggregate load for multiple commercial facilities, subject to their limitation policies.

Exhibit 9 provides, somewhat qualitatively, derived from discussions with numerous suppliers, the minimum size load that is both eligible for and likely to get bids for competitive supply.

State	Supplier Customer Interest	Supplier Exceptions
California	All*	Account aggregation possible for smaller accounts
Illinois	1,500/dths per year or Greater	Account aggregation possible for smaller accounts
Ohio	2,000/dths per year or Greater	Offerings for CHOICE accounts 2,000/dths and below are available
Pennsylvania	3,500/dths per year or Greater	Account aggregation possible for smaller accounts
New York	1,000/dths per year or Greater	Account aggregation possible for smaller accounts
New Jersey	1,000/dths per year or Greater	Account aggregation possible for smaller accounts
Maryland	1,000/dths per year or Greater	Account aggregation possible for smaller accounts
Note: Not all suppliers deliver in all LDCs or to all commercial/industrial classes		
*Offerings, prices, and process may differ between Core customers, those using less than 2080 dth per month, and Non-core customers		

VII. Summary

Factors governing the price of natural gas suggest a period of higher prices on average when compared to past years, with the likelihood that during the next year or two, the market will continue to see periods of high volatility. At the same time, the futures markets show a decline in prices over the same period.

Buyers are advised to match their energy supply strategy with their overall business strategy. Most should mitigate their risk by diversifying their supply mix in terms product type, contract end date, and suppliers. Where possible, buyers should place some portion of their facilities with competitive suppliers. In general, choosing an alternate supplier will offer greater flexibility in terms of market timing, and allow buyers to capitalize on favorable wholesale market movement by being able to fix their commodity price quickly as the opportunities present themselves.

In order to make the best decisions, buyers should familiarize themselves with gas markets and/or seek help from consultants or suppliers to determine the best products and timing for their businesses. They should also consider taking an indexed or fixed basis product initially, with an option to fix the commodity price during the contract term. Now may not be the best time to fix, but if history is an indication (traditionally gas market prices are reduced in the summer and higher in winter, but generation demand for air conditioning in the summer has modified this somewhat), the next several weeks may offer an opportunity to capitalize on a downward move coupled with a backwardated market.

Finally, buyers should track market movement, stay informed, be flexible and realistic and, most importantly, be prepared to take action when opportunities present themselves.

About EnergyWindow

EnergyWindow is a Boulder, Colo.-based company that offers a comprehensive suite of information technology-based tools and energy industry expertise that help businesses manage every aspect of their energy supply cycle (natural gas and electricity). EnergyWindow offers four key areas of products and services: 1) An online energy sourcing tool for energy procurement; 2) a real-time, online energy market database, 3) an energy management information system that tracks and analyzes a company's energy usage, and 4) energy supply strategy and management consulting. The company was founded in 1999. To date, the company has helped three dozen national companies reduce \$100 million in energy costs by \$20 million. The company can be reached at: www.energywindow.com, or (303) 444-2366.