Natural gas prices in the US are at an all-time high. The Gulf Coast hurricanes and record summer heat have taken their toll, and business is feeling the effect. Studying and applying seasonality can often protect aganst the volatility of these markets, but, as *Eric Fishhaut* explains, even that is not a complete solution

What drives natural gas?

★ A confluence of factors has driven natural gas prices in the US to all-time highs in the fourth quarter of 2005. In spite of a relatively mild autumn and predictions for moderate winter temperatures, record summer heat and two major hurricanes have been more than enough to drive markets to fear the worst.

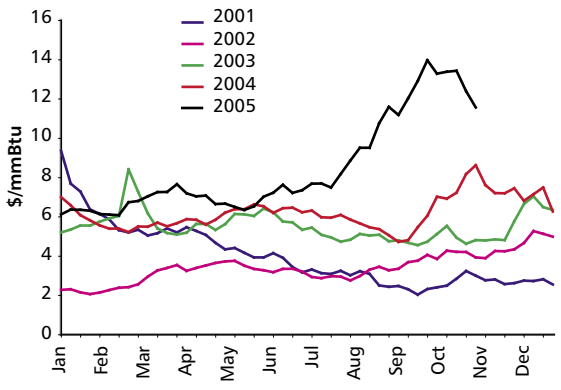
Inventories started in April significantly above the previous year, but extra high air-conditioning demand, then the two Gulf Coast storms that hit in August and September, reduced supplies. Storage has risen steadily since the recent disasters to within 2% behind levels at the same period last year, with totals easily above the five-year average, according to the US Energy Information Administration (EIA). US domestic gas inventories stood at 3.229 trillion cubic feet (tcf) as of November 4, the US Department of Energy says. Peak winter stocks have averaged 3.1 tcf over the past five years. While inventories should be adequate to meet normal heating season needs, worries persist about reduced gas output in the Gulf Coast.

The severe disruptions to natural gas production in this region caused by Hurricanes Katrina and Rita have resulted in higher wholesale prices, with the market likely to stay tight over the next couple of months. Approximately 20% of all the natural gas produced in the US is produced in the Gulf of Mexico. Recently, the regional production was gauged to be near 65% capacity. Cumulative gas shut-ins (halted production) in the region have reached more than 442 billion cubic feet (bcf) – equivalent to approximately 12% of yearly Gulf output of some 3.65 tcf. Even when full natural gas production is restored in the Gulf region, supplies of natural gas will remain tight – as they have been for the past five years – until steps are taken to promote increased domestic production and additional imports of liquefied natural gas.

US natural gas is the most expensive in the world, with prices now four times what they were four years ago (see figures 1 and 2). The continued dramatic rise in domestic natural gas prices has had a far-ranging impact. The EIA released its official *Winter Fuels Outlook* in mid-October, warning that

Source: Nymex via GlobalView

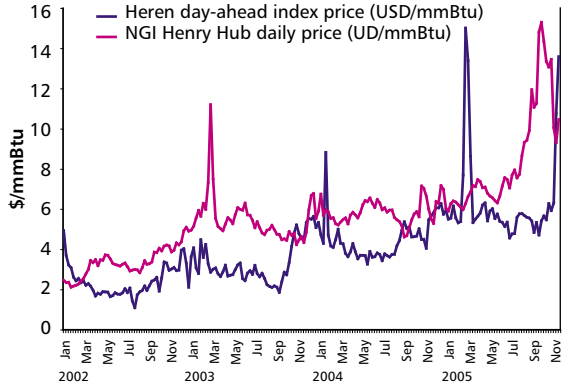
F1. Year-on-year comparison 2001–5 natural gas price



The price of Nymex natural gas futures ($/mmBtu) this year has skyrocketed compared with previous years due to normal seasonal storage build-up, exceptional supply disruptions and the extraordinary price of crude oil.

Source: Natural Gas Intelligence and Heren Energy via GlobalView

F2. Comparison of US natural gas benchmark to UK



A four-year comparison of natural gas benchmarks in the United States and the United Kingdom shows that, with a few exceptions for short-term price spikes, the price in the United States is consistently higher.

consumers using gas to heat homes should expect an average increase of near 50% over last year.

Business consumers are really feeling the effect. Dow Chemicals said in congressional presentation that it will continue building plants overseas unless the US government takes steps to increase domestic supplies of natural gas. Raw material and energy costs have soared to 50% of the company's global expenses from 29 percent in 2002. Dow has raised chemical prices by 50% since 2002, closed 23 North American plants and shifted production to places where energy costs are cheaper.

Caught on the wrong side

The run-up in natural gas prices has left some hedge-fund traders with the short end of the stick. Where there were just over 100 hedge funds with energy-trading strategies last year, there are more than 400 now, an explosion that is bound to create a few winners – and some big losers. Since the price spike began in August, Citadel Investment Group, a $12 billion fund group in Chicago, is thought to have lost $150 million from its power trading positions, according to analysts. Ritchie Capital Management, another Chicago fund with $3 billion under management, may have lost $100 million. The head of Citadel Energy Products recently resigned, leaving the firm's future energy-trading plans uncertain.

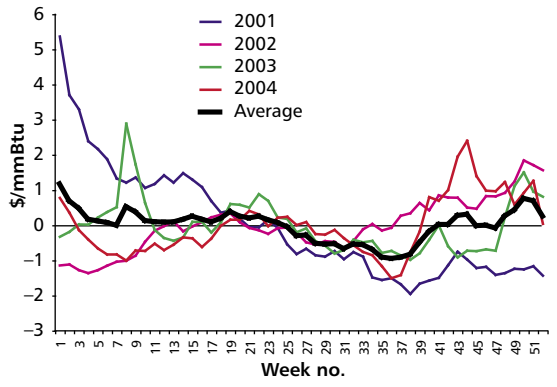
There were signs of strain even before hurricane Katrina. Enchanted Rock, a $200 million fund that opened barely nine months ago, shut its doors in August and returned its money to investors, after losing more than 7% this year. The fund manager, a top power trader for Calpine who left to start the fund, blamed the failure on extreme volatility in the natural gas futures market.

For a number of years, movements of natural gas prices in the US have generally tracked those of crude oil. Most of the time, crude oil prices are shaped by world oil market conditions, and natural gas prices adjust to oil prices. In the past, the two commodities have been used as close substitutes in industry and electric power generation, effectively switched back and forth based on whichever energy source was less expensive.

Over the years, however, the number of facilities able to switch between natural gas and residual fuel oil has declined. And in the most recent five years, natural gas prices seemed to move somewhat independently of oil prices. Some analysts find that according to commonly used rules-of-thumb, the relationship between natural gas and crude oil prices has changed. When normal seasonal variation in natural gas prices and the amount of natural gas in storage is studied, however, evidence can be found that natural gas prices continue to be related to those for crude oil – in a relatively stable yet complex relationship.

Source: Nymex via GlobalView

F3. Seasonal difference for US natural gas



Here we plot the daily difference against the annual average for each year from 2001 to 2004. The average difference of the four years highlights the seasonal peaks and valleys expected due to typical supply and demand forces.

Seasonal views

One popular way to study the natural gas market is through seasonal data. This approach originates from the premise that each market has fundamental forces peculiar unto itself that act upon it every year. One may broadly define seasonality as a consistent market tendency to react to certain forces and repeat similar price movements annually in a way that may be observed and quantified. The pattern of seasonality implies a degree of reliability.

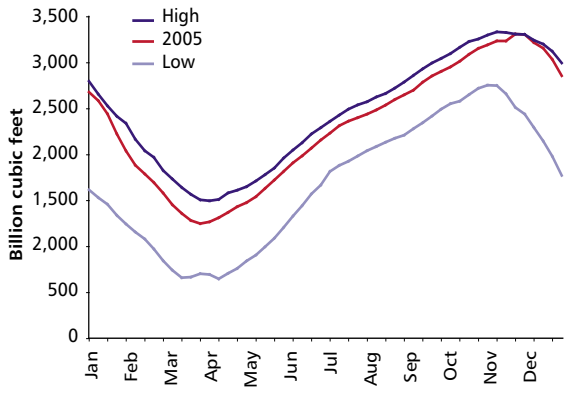
Because a primary function of futures markets is to anticipate movements, prices tend to move when change is expected, such as improving weather, and to adjust once that change is realised. When that change is annual, a recurring cycle of anticipation/realisation evolves. That dynamic is intrinsic to the seasonal approach to trading – designed to anticipate, enter, and capture recurrent trends as they emerge and exit before they are realised.

The purpose of seasonal research is to find recurrent trends within a seasonal price pattern. Using comprehensive computer charting packages, one can construct a daily seasonal pattern of price behaviour derived from a composite of daily price activity through several years. That pattern reflects where, during given calendar periods of the year, a market has tended to trade within its annual cycle. We can focus on the seasonal pattern of trading in natural gas.

The market for US natural gas is strongly driven by seasonal demand. Northern regions depend on it for heat during the cold winter whereas warmer southern regions depend on it to generate electricity to run air conditioners during the hot summer. The two regions typically hit their peaks in opposite seasons – during the depth of winter consumption is highest in northern regions, and lowest in southern regions. This tends to smooth the pricing through the year, but there are typically price rises during periods of aggressive inventory accumulation in spring and autumn. Studying the averages over the past four years shows that seasonal factors affect the natural gas price significantly – adding more than $1 per mmBtu during the first week of the year and subtracting nearly $1 around the 36th week of the year (see figure 3).

Source EIA via GlobalView

F4. Working gas storage: current and five-year ranges



The current year's natural gas storage values in billions of cubic feet are provided weekly against the high and low storage figures of the previous five years. The strong seasonal aspect of the storage is apparent, and this year levels are at or near the high end of recent years.

Both seasonality and the natural gas in storage play a prominent role in natural gas prices. Because natural gas consumption is seasonal but production is not, natural gas inventories are built during the summer for use in the winter. Inventories above the seasonal average depress prices, and inventories below the seasonal average boost prices (figure 4).

It would seem that the seasonal study provides fundamental information for timing market trading. Even such dynamic trading patterns do not repeat without fail, however. Seasonal research is statistical analysis – factual but performed with the benefit of hindsight. Statistics confirm the past but cannot predict the future. Each new season brings weather, changes and events that will affect supply and potentially skew the pattern. Deviations of actual from expected supplies can have a pronounced impact on seasonal price patterns.

If fundamentals drive markets, then recurring fundamentals can drive recurring market responses – a cause-and-effect relationship that is indeed seasonal. By placing these recurring events into the context of supply and demand, one is able to narrow down potential speculative situations into timeframes where the most opportunity exists. ER

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