

US energy prices: in line for a fall?

A combination of concerns in the second half of January 2003 has boosted US oil and natural gas prices to levels not seen since the winter of 2000/2001. Will the higher prices stick? Logical Information Machines examines cause and effect

The second half of January saw US energy price levels not seen since the energy market tanked after the demise of Enron. The price increases in US natural gas and crude oil markets (see figure 1) have been caused primarily by three fundamental factors.

Abroad, the two-month-old Venezuelan oil strike has threatened US oil supplies, and the threat of conflict with Iraq has added a 'war premium' to world oil prices. Meanwhile, at home, an unusually cold winter has led to an increase in natural gas prices, even though economic activity is well below the levels of 2000, when the high-tech economic boom combined with cold weather to send prices soaring.

Venezuela strike

US oil market fundamentals this year show the impact of reduced output of crude from Venezuela during the two-month-long strike against the government of President Hugo Chavez. Regular Venezuelan exports of 2.4 million barrels a day (b/d) are mostly consumed by US east coast and Gulf refineries. Yet while Venezuelan export levels rose as the strike faltered – with some workers returning to work – at the end of January 2003, the average level of exports during the strike has been below 0.5 million b/d. Even when the strike ends, it could take years for exports to return to

pre-strike levels, as the oil fields need new investment to boost output.

US Department of Energy (DoE) crude inventory data shows that US oil stocks hit a low of 272.26 million barrels on January 10, 2003 and remained at around 273 million for the following two weeks. The number of days of crude supply – known as 'day's supply' – can be calculated by dividing the DoE stock level by estimated crude demand in barrels per day, as determined by imports, the change in stocks, and input to refineries.

Figure 2 shows the decline in crude oil day's supply since 1990 – due to improved refiner efficiency through better inventory control. Lower inventories in 2003 reflect the impact of the Venezuelan oil strike on crude supplies. Higher prices prevail today because of the Iraq war premium, whereas lower market values are expected to return after any war.

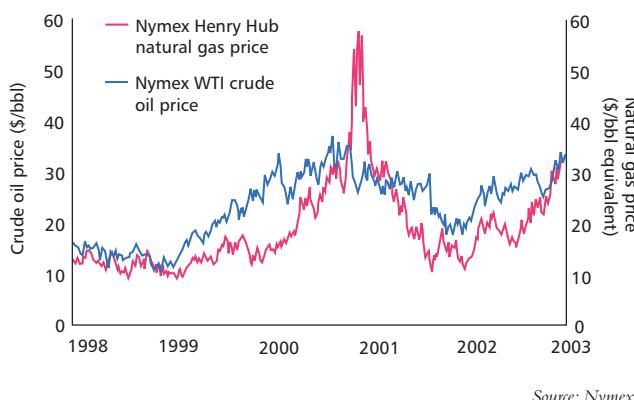
In an effort to alleviate dwindling Venezuelan crude supplies, the Organisation of Petroleum Exporting Countries (Opec) met several times and promised to increase crude output – most recently on January 10. But the impact of higher production was slow to take effect because crude from the main Opec producers in the Middle East takes at least 45 days to reach US markets.

War premium

In addition to the threat to Venezuelan supplies from the strike, US crude oil prices have also been underpinned since summer 2002 by the growing diplomatic and political crisis over Iraq. The market has factored-in the potential oil supply disruption that a US-led invasion of Iraq would cause. This is in spite of the fact that Iraq only currently produces about 1.5 million barrels of crude a day, and most of that is now being consumed outside the US.

The fear that some kind of conflict in the Middle East might escalate and threaten oil markets worldwide lies behind higher prices, which have now risen close to \$35/bbl and are experiencing volatility as news events regularly drive

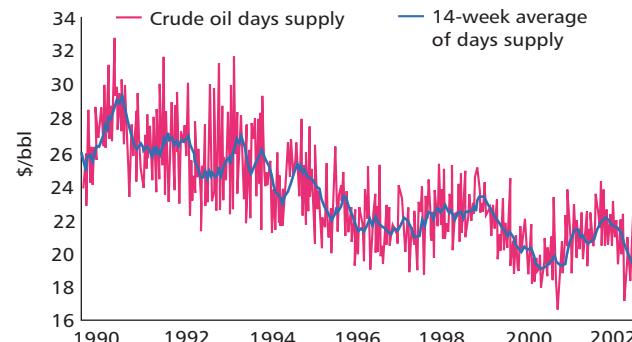
Figure 1: US crude oil and natural gas prices



Source: Nymex

Natural gas prices peaked in the winter of 2000/2001 before falling steeply during 2001. After a mild winter between 2001 and 2002, natural gas prices have risen again since October 2002. Crude prices have rallied in the past year from below \$20/bbl to more than \$33/bbl, amid fears of war and supply disruption.

Figure 2: US crude oil days supply



Source: US Department of Energy

US crude day's supply and its 14-week moving average since 1990. Crude day's supply values stay low today because oil is more expensive and in short supply due to the Venezuela and Iraq situations. It is, quite simply, less expensive to use up your crude stocks and wait for lower prices tomorrow, than to buy today.

the daily price of New York Mercantile Exchange West Texas Intermediate (Nymex WTI) front-month crude oil up or down by a dollar or more per barrel.

Market backwardation

Figure 3 shows forward curves of Nymex crude futures prices as they stood in January 2002, November 2002 and January 2003, as well as the daily closing price of Nymex crude from July 2001 to the present. The forward curve in January 2002 shows prices rising into the future – a situation known as contango. The curves for November 2002 and January 2003 show a steep fall-off in future prices – known as backwardation.

For example, the daily Nymex crude settlement price on January 31, 2003 for March 2003 delivered contracts was \$33.51/bbl, while March 2004 contracts traded on the same day for \$26.12/bbl, representing backwardation of \$7.39/bbl.

The steep backwardation means the futures market expects the Venezuelan strike and the Iraq war situation to be resolved, allowing crude prices to fall quickly to normal levels.

Cold weather

Meanwhile, January 2003 temperatures in the US have been among the lowest in recent memory. Freezing temperatures across the country caused US natural gas prices in general to emerge from their hibernation of last winter and brought good humour back to an industry plagued by accusations of price fixing and ‘round trip’ trades.

New York City natural gas prices at Transco Zone 6 topped out at \$5 per million British thermal units (mmBtu) in January 2002, but climbed to a high of \$18/mmBtu in 2003. The cold weather produced temperatures consistently below freezing for long periods. High temperatures in New York,

for example, were below freezing for 11 days in a row. For the country as a whole, the benchmark Nymex Henry Hub contract traded above \$5/mmBtu for most of January 2003, compared with values between \$2/mmBtu and \$2.50/mmBtu in January 2002.

Long cold periods affect the natural gas market in the US, because underground storage reserves get consumed without a break to replenish stocks. The consequence is a perceived shortage of stored gas for alleviating future periods of high demand. Low storage causes underlying prices to rise (see figure 4).

Looking ahead

While the Venezuelan oil strike shows signs of faltering after two months and Opec promises of higher production to meet the crude shortfall start to make an impact on supplies, the threat of war in Iraq continues to underpin higher crude prices. The shape of the forward curve in the Nymex crude futures market clearly shows that prices are expected to tumble once the political crisis is over.

As for natural gas, supplies in the US remain tight for now, but the cold weather cannot go on forever, and relief will come with warmer spring weather. Longer-term estimates of US gas production and demand suggest supplies will remain tight next year, keeping prices around \$5/mmBtu.

Software vendor Logical Information Machines studied previous occasions where both Nymex crude oil and natural gas futures prices had risen by 30% in the previous quarter, to see if the rally was sustained in the next quarter. Since the Nymex contracts were launched, crude and gas prices have risen by 30% in a quarter 15 times in all. In 93% of cases, crude prices continued to rise in the following quarter by an average of \$3/bbl, while natural gas prices fell back 64% of the time by an average of 60 cents/mmBtu.

Why is this trend so consistent? Crude oil rallies are more likely to be sustained for longer than those for natural gas, because of the strong seasonality of natural gas – which is used most in the winter for heating. Crude oil tends to be governed more by world events. A rally in both natural gas and crude oil is therefore likely to be a winter affair and any increase in natural gas will be blunted by the advent of warmer weather, whereas crude prices can continue to rise, regardless of the season. [EPRM](#)

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Figure 3: Nymex crude oil futures price curves

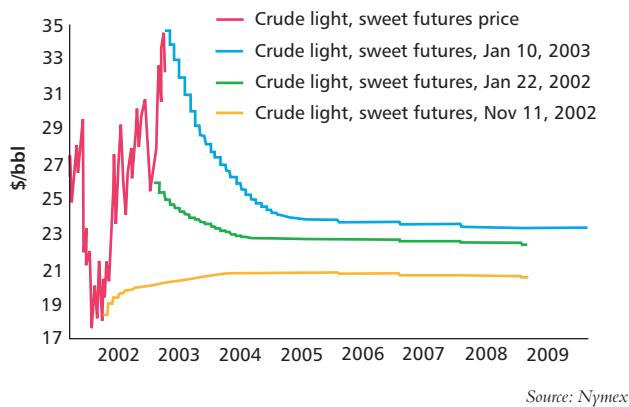
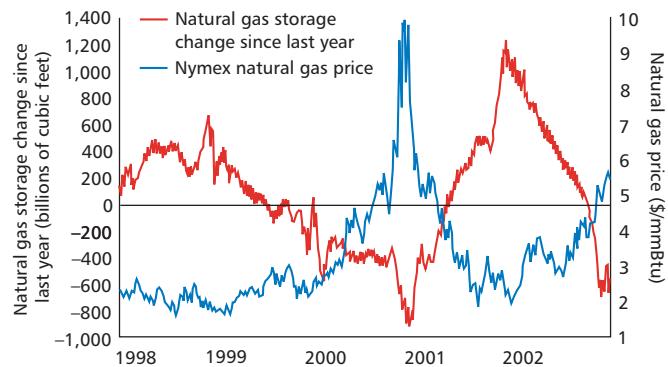


Figure 4: Natural gas storage change v. price



The figure shows Nymex West Texas Intermediate crude futures settlement prices since the start of 2002, with the forward curves as at January 22, 2002, November 11, 2002 and January 10, 2003. The view in January 2002 was that prices would rise, but by January 2003 the futures market direction had reversed to show falling prices.

The figure shows the change up or down in total US natural gas storage since last year. Gas storage acts like a sponge, to soak up excess gas during periods of low demand and release it in response to sudden demand increases. Prices rise in anticipation of shortages when storage levels fall too low.