Oil Supply and Demand

World oil demand, driven by economic development in China, posted the highest growth rate in 20 years. In a context of geopolitical uncertainty, prices are soaring, encouraged by low inventory and the low availability of residual production capacity. Will 2004 bring a change in the oil market paradigm?

Before reviewing the situation for 2004, we might want to look back at the outstanding events of 2003 and at the forecasts made for the current year based on those events.

2003: The Shadow of Overproduction

Immediately before the armed intervention in Iraq, the most optimistic scenarios forecast that production would grow rapidly. The statistics for January and February were already close to 2.5 Mbbl/day and, despite a nearly total interruption in the second quarter, it was thought that by year-end production would reach 3 Mbbl/day. To prevent any shortage of supply due to the military intervention and to try to contain the rise in the price per barrel, which passed the US$35 mark in February in New York, OPEC increased its quotas three times during the first half-year, for a total of 3.7 Mbbl/day. The production of OPEC (not including Iraq) rapidly climbed from 24 to 26 Mbbl/day, despite the difficulties encountered by Venezuela in returning to its pre-strike production level of December 2002.

On the demand front, although a production increase of nearly 1.7 Mbbl/day exceeded the average for the last ten years (about 1.1 Mbbl/day), the cumulative effect of several independent economic factors was to promote a rapid return to the historic average: the winter of 2002-2003 was colder than usual in the Northern Hemisphere, gas prices surged in the United States and several nuclear power plants were shut down in Japan. As a result, oil consumption spiked. However, these factors were all temporary in nature; the only structural factor was the demand coming from China, which has grown steadily (0.2 to 0.3 Mbbl/day) since the mid 1990s.

Several factors seemed to indicate the occurrence of a production surplus that would depress prices: the imminent lifting of the embargo on Iraq, an increase in non-OPEC production of about 0.9 Mbbl/day (including 0.8 Mbbl/day from Russia alone) and the likelihood of a slowdown in demand. As usual, all eyes turned towards OPEC, which would have to perform the arbitrage, always difficult, between supporting prices and preserving market share. On September 24, 2003, at its 127th meeting in Vienna, the organization decided to cut quotas by 0.9 Mbbl/day, starting in November. This came as a surprise: for several months, the OPEC basket had been hovering at the top of the US$22-28 price range.

The key argument used to justify this decision was that OECD countries were rapidly replenishing their crude inventory and that the pace of demand in the last quarter of the year merely reflected a normal seasonal variation. The speed with which this decision was made suggests that the prominent exporting countries feared that, once again, they would be confronted with a market imbalance leading to an uncontrollable accumulation of stocks, synonymous with a downwards price spiral. The risk of a recurrence of the “Djakarta syndrome”, referring to the OPEC meeting of late 1997 that helped trigger the price collapse of 1998, was greatly overestimated: crude inventory in the United States peaked in September 2003 at 280 Mbbl, as opposed to 320 million barrels at year-end 1997.

This convinced the market that OPEC would defend the threshold of $25 instead of $22, as it had, at least officially, in the four previous years. The psychological impact was enormous: in the final weeks of 2003, as the winter season approached, crude prices rose by about 15% and the price per barrel passed the $30 mark.

2004: Skyrocketing Prices

In early 2004, two signals gave reason to doubt the possibility of overproduction. First, it was taking a long time for the most recent OPEC decision to take effect: the ten member states that had entered into the agreement continued to produce 26 Mbbl/day, nearly 1.4 Mbbl/day over the official ceiling. Secondly, OECD inventory fell continuously, reaching historic lows. Each month, they confirmed demand forecasts issued by the International Energy Agency, which were being steadily raised.

The forecast for world oil demand formulated in July 2003 cited a figure of 79.1 Mbbl/day. A subsequent estimate put demand at over 82 Mbbl/day. Obviously, the fears of the exporters were not justified. It would be necessary to take another look at market equilibrium.

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A Market Driven by Demand

In recent months, it has been necessary to re-estimate world oil demand mainly because the acceleration of Chinese demand has defied the principles governing the energy economy. In 2003, the elasticity of demand with respect to revenue, about 0.7-0.8 in recent years, surged to 1.2. In 2004, it should be even higher, close to 2. Given an economy growing at the official rate of 8.5%, Chinese oil demand should increase by nearly 16%, an increment of 0.8 Mbbl/day. This performance depends first of all on the massive amounts of capital flowing into the Celestial Empire, translating simultaneously into rapid industrialization and the spread of mass consumption modes, starting with transport systems. Oil demand was stimulated by the extra energy demand needed to support such a high growth rate, in addition to two other unrelated reasons. Domestic oil prices were controlled, which tended to cushion the market from international price fluctuations. Secondly, the rationing of grid-supplied power (up to 3 days a week at the worst of the shortage) prompted industrialists to acquire their own generators, resulting in strong and unexpected demand for diesel fuel. In both 2003 and 2004, China accounted for 30% of the increase in world consumption.

That the market turned bullish can be attributed not only to Chinese demand, but also to most of the other consumption markets. Current U.S. growth is twice the average rate, representing about 0.4 Mbbl/day, with an apparently unquenchable thirst for motor fuels. To this increase in American demand in the strict sense, one should add the accumulation of crude in the Strategic Petroleum Reserve (SPR) at the rate of 0.1 Mbbl/day. The United States contributed to the rise in world demand by 0.5 Mbbl/day.

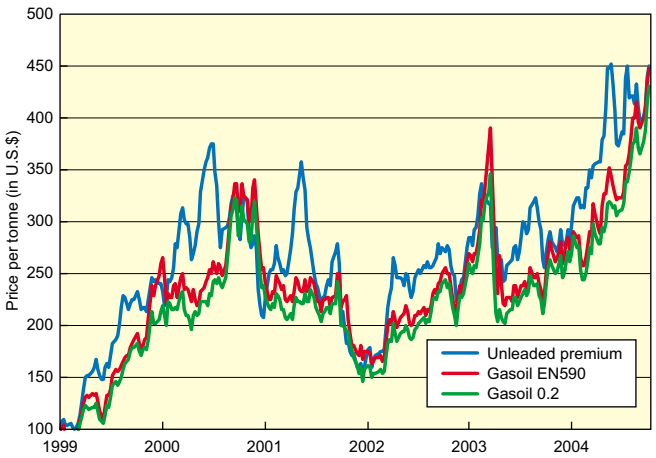
Consumption in Japan is now about the same as before the shutdown of its nuclear power plants in 2003. The rest of Asia has posted a solid increase of 0.5 Mbbl/day including about 0.15 Mbbl/day for the Indian market. Demand from the Middle East, supported by the development of large-scale petrochemical projects, has grown by 0.35 Mbbl/day. As for European OECD countries, their markets, supposedly mature, are increasing by nearly 0.3 Mbbl/day.

The occurrence of strong growth on nearly all markets — the rate is generally double the average for the last ten years — is an event that, in itself, would impact crude prices. But the boom in Chinese consumption was the decisive element invalidating a theory that has prevailed since the counter-shock of 1986, whereby demand slows when prices rise and accelerates when prices fall. It sheds new light on the subject of production capacity, throwing its shortcomings into harsh relief.

Disequilibrium between Refining Capacity and Final Demand

During the first ten months, the crude price rose continuously, by nearly 70% in all, which reveals the fundamental precarity of supply-demand equilibrium. There are bottlenecks all along the oil supply chain.

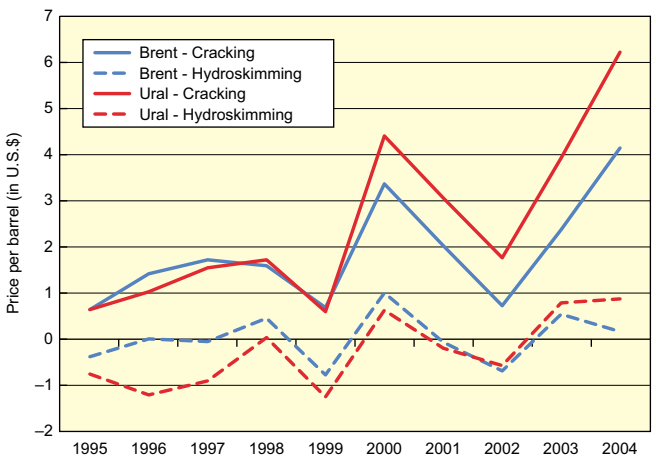
Fig. 1 Variations in petroleum product prices in Europe



Source: PLATTS

In recent years, the trend for world refinery utilization rates indicates rising tension in the supply-demand equilibrium for petroleum products. Given the way consumption has grown in the early months of the year, it is estimated that, for 2004, average refinery utilization rates should reach between 92 and 95% on the three key markets (North America, Western Europe and Asia). These high values illustrate the quantitative aspect of disequilibrium on these markets.

Fig. 2 Variations in refining margins – NWE



Source: IEA

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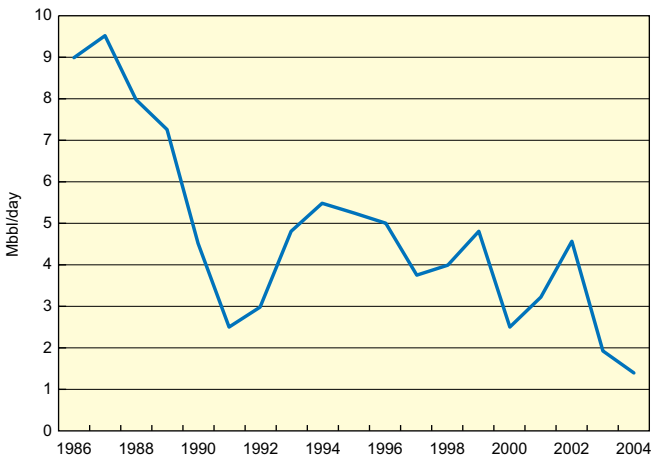
The problem of the low availability of excess atmospheric distillation capacity was compounded by a growing shift in terms of quality, with an increasing preference for light refinery products over heavy fuel oils. That existing refining infrastructure would have difficulty following this demand shift became evident in 2000, as the first tensions emerged on the gasoline market. The price of unleaded gas in the Amsterdam-Rotterdam-Anvers area had peaked in June at $375/tonne. In 2004, the same product cost over $450/tonne. The price of diesel motor fuel (Gasoil EN590) and heating oil (Gasoil 0.2) were substantially higher in 2004 than in 2000, attaining $470 and 450 per tonne versus $340 and 320, respectively.

During the first few months of 2004, refining margins on key markets were generally 2.5 to 3 times higher than the average for 1995-2003 and 1.2 to 1.5 times higher than the previous record figures of 2000. More, the disequilibrium on the oil market related to qualitative concerns, witness the price differential between the cracking or hydrocracking margins and the hydroskimming margin: $3.5-5.5 per barrel, nearly 2.5 times the average price differential for 1995-2003.

Upstream Capacity Saturated

Refineries were having a hard time following this demand trend, a situation that was aggravated in the last months of the year by a shortage of upstream capacity. The residual capacity maintained by OPEC producers, especially Saudi Arabia, has played a direct role in preserving oil market equilibrium since the countershock of 1986. Depending on the year, this capacity represents 5 to 7% of the world market, or about 3 to 5 Mbbl/day. In 2004, it fell below 2 Mbbl/day at a time when the market stood at nearly 82 Mbbl/day, reducing OPEC's ability to exert a regulating effect and aggravating the risk of a supply shortage. The availability of residual capacity was low due to an error of appreciation bearing on two key short-term market variables: the acceleration of growth in Chinese demand and the deferral of Iraq's return to the oil scene. The 2003 forecasts of overproduction, which never finally materialized, illustrate once again that energy forecasts may be self-destructive.

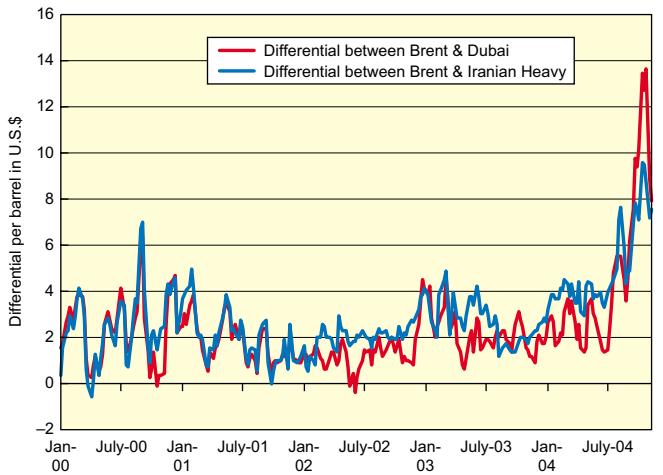
Fig. 3 Excess OPEC production capacity



Source: IEA - IFP

That prices rocketed to $50 a barrel in New York (WTI) and London (Brent) highlights not only the low availability of residual capacity, but also growing refinery demand for light, low-sulfur crudes in response to a structural shift in final demand for lighter refined products. The average price differentials between light crudes (*e.g.* the Brent) and heavier crudes reached all-time highs, nearly 2.5 times superior to the average for 1992-2003. When prices peaked, the differentials between the Brent and the Dubai, the Oman or the Iranian heavy exceeded $10 per barrel. Starting in the second quarter, OPEC resolved to counter price hikes but encountered two obstacles: the saturation of capacity and the quality deficit of the crudes on offer. Generally, the latter were too heavy and contained too much sulfur to meet refinery requirements.

Fig. 4 Price differentials between light and heavy crudes



Source: PLATTS - IFP

Oil shipping: The Resorption of Excess Capacity

Like upstream and refining capacity, shipping capacity reached saturation. Since 2003, growth on the oil market was strong, which affected the tanker market and translated into freight rates notably superior to historic averages. Rising shipping costs also reflected the enforcement of more stringent regulations. New deliveries and shipyard construction starts are not expected to fully cover the loss of capacity, especially from 2005. In the last 15 years or so, the

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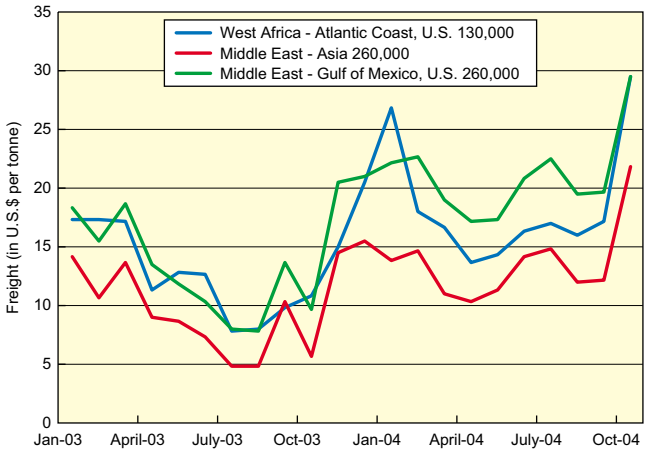
shipping market has absorbed idle capacity, which explains why freight rates have been rising in the last two years.

Fig. 5 Freight rate



Source: PLATTS

The Oil Market is Vulnerable

The impact of events likely to disrupt the oil supply can be intensified by many factors including constraints along the supply chain, the strength of demand, the chronically low level of inventory and the low availability of residual capacity. Throughout 2004, prices have been supported by threats to key exporting countries that are direct or indirect, isolated or recurrent.

In February, the Yukos-Sibneft merger was put on hold following the arrest of the chief executive of Yukos. Starting in March, relations between Venezuela and the United States underwent a sudden turn for the worse, to the point where it was thought that Venezuela might suspend shipments to the United States, its biggest crude customer. In Iraq and Saudi Arabia, the occurrence of outbursts of violence targeting oil infrastructure (pipelines, export terminals) and Western citizens adversely affect the climate throughout the Middle East. In Nigeria, recurrent social and ethnic tensions maintain uncertainty about the export of its crudes, which are among the most highly sought-after on the market. July and August were dominated by the vicissitudes of the Yukos case and the possible repercussions on Russian exports. In September and October, a strike by Norwegian workers was settled, but a series of hurricanes in the Gulf of Mexico caused the biggest disruptions in 12 years and slashed U.S. production by nearly 0.5 Mbbl/day.

Occurring on a market whose fundamentals were exposed to the greatest tensions since the 1970s, these exogenous factors were instrumental in driving prices, in current money terms, to a series of record-breaking highs. The increasing complexity of issues involved in every aspect of the oil market — whether upstream, downstream, geopolitical or environmental — prompts speculation about a possible change in paradigm.

The Outlook

For 2005, the analysts are all trying to determine how fast the world economy will grow. Can it grow at the same rate as in 2004 (expected to be 4.6%), despite the rising price of raw materials, particularly oil?

The Market Trend in 2005

In the next few months, price variations will mainly depend on the usual variables. Will current price levels suffice to ease demand while stimulating the development of supply and restoring residual production capacity? If not, it would be unreasonable to expect any significant decrease in prices.

There is a consensus among analysts that world economic growth will remain sustained, close to 4% a year, but that it will start to slow down. The upturn in interest rates in the United States and especially in China tends to confirm this hypothesis. It is thought that growth in these two economies, the main drivers of the oil market, will ease back to an annual rate of 0.2 and 0.35 Mbbl/day, respectively, according to the International Energy Agency. This is close to the average increase for the past decade. For world oil demand to grow at a lower rate — 1.5 as opposed to the current 2.7 Mbbl/day — the slowdown would have to be general, not limited to the Chinese economy.

As for non-OPEC production, the prospects for growth are in line with the rate of increase noted in recent years, *i.e.* slightly more than 1 Mbbl/day, the bulk of which is supplied by Russia, South America and Africa. Under these circumstances, OPEC would have to raise its quotas to prevent a deterioration in market equilibrium. Progress made on projects announced by member states could raise capacity by about 1 Mbbl/day compared to the beginning of 2004. The development of production capacity will continue to be a burning issue, even if market growth falls short of the most pessimistic scenarios, because this would certainly not suffice to restore residual capacity of 2 to 3 Mbbl/day. The year 2005 should bring a slackening of tensions, but the Brent price is not expected to descend below $30-35.

Towards a Change in Paradigm?

The symbolic threshold of $50 was reached this year amid controversy over a fundamental issue: Has the oil price been rising for 18 months for reasons that are structural in nature?

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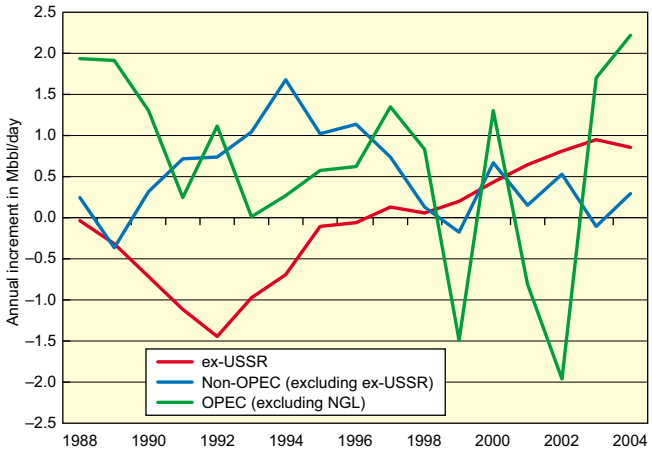
The current price, high in current dollar terms but still about 30% lower in constant dollars than it was in the early 1980s, is the product of the highest growth rate observed in 20 years. World demand has long been dominated by mature industrial (or even post-industrial) economies characterized by significant price elasticity to demand. Now the share of emerging economies showing a much lower price elasticity is rising quickly. In economies like the Chinese economy, apparently insensitive to oil price hikes, the primary stimulus for the creation of added value is the low cost of production, labor and capital. The cost of energy seems to be secondary. World oil demand may turn out to be less price sensitive in the future, at least in the short- and medium-term.

Fig. 6 Contributions to the annual increase in production



Source : IEA - IFP

The problematical issues relative to the need to meet rapidly growing demand in rapidly developing countries is fueling the "oil peak" debate between optimists and pessimists. For instance, there is controversy over the appraisal of world resources and reserves, the contribution to be made by technology and, above all, the date at which world production can be expected to peak. But this debate does not fully integrate such constraints as will be imposed on the sources of supply before the peak is confirmed by observation. It is thought that the production peak will probably look like a fairly long, flat curve, not the curve commonly represented as an increase followed by a symmetrical decline. Furthermore, non-OPEC producers would be first to experience a production decrease, which would reinforce OPEC's power as market regulator. The experience of 2003 and 2004 shows that the price per barrel depends on the marginal equilibrium of the market and on whether supply can cover incremental demand in the short term. Since the ex-USSR is the largest non-OPEC contributor to the increase in world consumption, a production slowdown in a few years' time would militate in favor of higher prices.

If the price per barrel stays durably or permanently above the $25 mark, it will be largely due to saturated capacity and the booming Chinese economy. This reading of the situation is confirmed by forward price quotations for crude deliveries in about 2010. They have risen significantly over the last 18 months, to nearly $35 a barrel. The vigor of the Chinese economy should not obscure the persistent structural weaknesses (*e.g.* at the banking and monetary level) typical of fast-changing countries. In 1997 and 1998, counter to all expectations and after a decade of exceptional economic growth, the countries of South-East Asia experienced a crisis of transition marked by a deep recession and a sharp drop-off in energy consumption. This sent the price per barrel into a downwards spiral which could only be halted by means of painful production reductions by key producing countries. Inevitably, China will experience stops and starts in the course of its development, which may or may not be acute, and may or may not be controlled. At any rate, the consequences will be felt worldwide, including by the oil market.

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