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*Enno Harks*

# Oil market challenges in the decades to come

A consumer's perspective

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Ludwigkirchplatz 3-4  
10719 Berlin  
Telefon +49 30 880 07-0  
Fax +49 30 880 07-100  
[www.swp-berlin.org](http://www.swp-berlin.org)  
[swp@swp-berlin.org](mailto:swp@swp-berlin.org)

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## Oil market challenges in the decades to come – a consumer's perspective

Energy supply and concomitant supply security have made it back on the political agenda, settling in as a top priority over the last two to three years. For a long time issues of supply security have been hot spots for energy mongers and political scientists only and a long and stable oil market period in the 1990's has made politicians believe the problem to disappear. But, from the 1998 Asian financial crisis and its consecutive oil bust onwards, oil market and world events have succeeded each other in quite a frantic manner: after the bust the market saw something that can rightly be termed an OPEC rebirth, gasoline strikes in Europe in 2000 due to what seemed back then to be high prices – heated by a debate about the US-dollar denomination of oil (as it happened to be on a strong exchange rate), the Sep-11 events laying question marks on future developments in the Middle East, the Venezuelan strike in Dec02, the invasion of Iraq in 2003 (with its continuing military intervention), Asian demand rise that had widely been unexpected, the US-Hurricanes, a world refinery situation that is clearly at maximum strains and finally oil prices that seem to have settled at wobbling around 60-70\$/bbl.

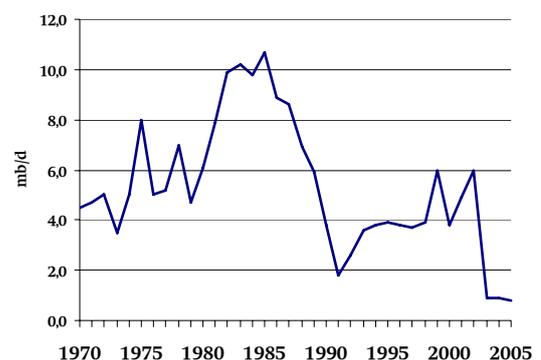
While much of these events were just repetitions that had happened many times in the past, the huge rise in prices to hitherto unknown levels has eventually increased awareness from the level of oil market observers to politicians and policy-makers. Obviously, the same holds true not only for oil but also for natural gas, as prices are linked to oil, monopoly power of distributors in Europe raises arguments and the Russian-Ukrainian price controversy came head-on. All these developments have rocketed supply and security of supply to the top of the agenda. Consequently, the key future challenges on the oil market shall be analyzed and presented here, challenges that will determine much of the future of oil in the coming decades – from a consumer nation's (European) perspective.

- Most problematic in the recent history has proven to be the vanishing of spare production capacity. While traditionally on average around 2-4 mb/d, with peaks at 10mb/d, free capacity levels have shrunk since the start of 2003 to a

little over 1mb/d (which could be judged an optimistic viewpoint). This ultra-low level of spare capacity is the main factor for today's market tensions and high prices. Disruptions (and may they be minor) and/or any further demand increases are very hard to cope with, forcing market equilibrium through prices, not supply.

Three main events are accountable for the hefty dive of capacity levels: first, the Venezuelan general strike in December 2002, which disrupted more than 2.5 mb/d of world supplies for more than 6 weeks (consequences of the strike can still be felt today, as Venezuelan production capacity has never been fully restored due to well-head damages during the shut-down). Second, the US military invasion of Iraq only a few months later (March 2003) disrupted a further 2.5 mb/d from the market (and while production could be restored from 0.16 mb/d in Apr03 to 1.97mb/d in Dec03, production since then has come down to 1.5mb/d in Dec2005 owing to local insecurity). In both occasions, existing idle capacity was brought on-stream to replace the missing barrels. On top of these losses, thirdly, came the unexpected Chinese demand boom. World oil consumption has increased by a total of 7.5 mb/d in the period 2002-2006 – almost 10%. As a consequence, most available spare capacity was used, straining the market and raising prices heavily.

World oil spare capacity  
1970-2005



Source: IEA, own calculations

Spare capacity is something rather difficult to grasp, from an economic point of view – and is, on a world-scale, an extremely rare exception. This is due to the fact, that from a business

perspective, it makes no sense to install capacity which is then left idle. Consequently, the idea and reality of spare capacity is inexistent in market based (western) oil multinationals. The same holds true for most other commodities (such as coal, tin, copper etc.) and products. The spare capacity held in the oil market is almost exclusively held by OPEC, mostly due to historic reasons (capacity vs. production levels in the 1970's) and enabling the cartel to influence, but also to calm the market. Only its capability to draw on the spare capacity has allowed the formulation and management (for some years) of a price band.

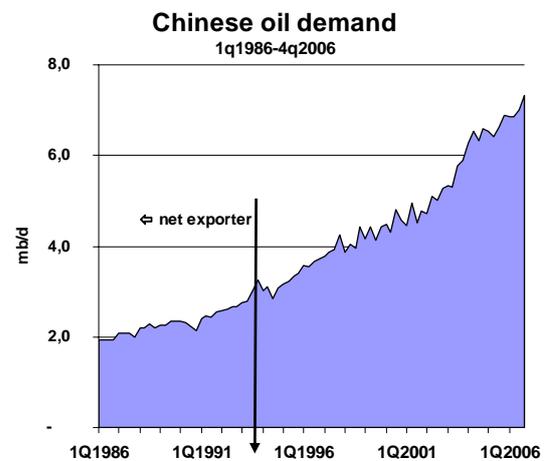
However, the times of spare capacity have gone and their comeback is by no means certain, given exploration and investment behavior of OPEC nations. This raises concerns in consumer nations as the lack of spare capacity does not only increase the level of prices, but especially so their volatility. And the latter has proven to be the real threat on the oil market, as investment decisions are heavily influenced by price expectations: production and price *cycles* are prone to become more intense (see the huge cyclic behavior of other commodities).

Without spare capacity, what could be done to counteract price volatility and concomitant negative effects on world economy? Most importantly: market transparency. Producers and consumers need to come to a common vision about oil market trends and, more specifically, agree about expected demand (and supply). Should a mutual understanding be reached, production capacity can be oriented along the lines of expected demand, thus avoiding sharp downturns or price-explosions. The lack of spare capacity could be counterbalanced by better transparency.

- The strong rise of Asian demand has been the most noteworthy development in terms of pure market metrics. As noted above, world demand is set to rise 2002-06 by a fabulous 7.5mb/d, mostly fuelled by strong Chinese demand. Concomitant with annual GDP growth of 8.5% in 2000-2004, Chinese oil demand has risen by 8.4% p.a. Considering that China was an oil exporter only a dozen years ago, the market was taken by surprise. This leads one to wonder whether this demand growth is to be sustained in the years to

come, ie. whether this momentum will continue to keep its strain on the market. If history is any guide, then this is going to be the case. Two predecessors with a similar development come into mind: Taiwan and South-Korea. During the period 1980-97, both countries grew by 7.5% p.a. Oil consumption growth was some 4.3% in Taiwan and 8.7% in Korea. These examples show that huge growth rates were possible for industrializing nations for a period of 17 consecutive years – showing in many aspects a very similar development pattern as China.

Accordingly, there is some room to believe



Source: IEA, Energy Balances, June 2005

that Chinese oil demand, really soaring since 2000 only, can continue to grow heavily for quite a number of years in the future. As a consequence, demand-side pressure on prices are not likely to wane any time soon – notwithstanding (geo-)political wild card events.

- From a consumer perspective, the increasing regional concentration of remaining oil (and gas) reserves raises concerns. This is not only due to the political conundrum of heavily divergent interests in the region that has built up over the past and lead to a high expectancy of future (further) instability. It is also due to the fact that a) access to the reserves is mostly prohibited to what could be termed 'market forces' and that b) the resource owners do necessarily follow different rationales as to the optimal path of resource extraction over the total life-cycle of the resource.

The former is in good part due to historical and colonial experiences and background.

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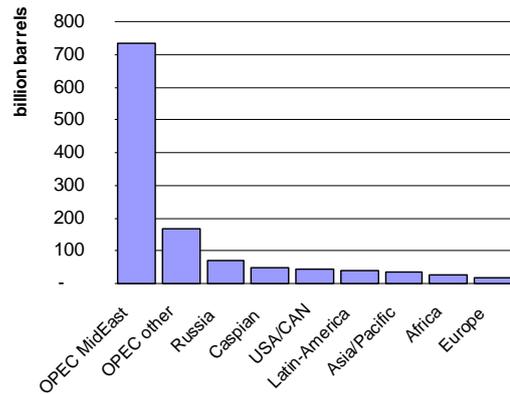
However, lack of access to upstream resource extraction disregards market allocation of funds and technology, thus leading to sub-optimal extraction paths, and, what concerns the consumer, higher prices. Under these circumstances, production depends on the extraction path decision of the state. And, from a consumer's perspective, the producer state's optimum is unlikely to be congruent to the own optimum. That is especially the case, as long-term considerations of resource extraction paths coincide with short-term necessities of spending oil revenues on fiscal items (rather than on investment, leading to, in some cases, capital accumulation below critical mass).

At the same time, huge reserves are still lying in consumer nations. However, production from these reserves are dwindling fast over the coming decades and unconventional reserves becoming conventional sources (such as oil sands) may be huge quantities, but even the most optimistic scenario does not give these hard-to-produce reserves the daily production capacity to replace the declining traditional reserves in the OECD. As a result, more reliance on OPEC production capacities follows. This is reinforced by the fact that most observers believe that world oil production outside OPEC / Former Soviet Union has already peaked or is about to peak. Oil demand increases can thus only be dealt with in cooperation with the resource-owners of the Middle East.

In the end, it all burns down to the question of price. Optimization must take place somewhere between production costs and X, with X favorably as low as possible for the consumers and as high as possible for the producers. However, too high prices may peak the consumer out of the market in the long term. Due to huge reserves and asymptotic production curves, oil will most probably still be there in more than a hundred years; however, if prices are too high (market and/or political prices), consumers may have left the stone age before the last stone is produced.

- At the same time, consumer nations share concern over the mid-term consequences on the world financial markets of the huge revenues the high oil prices engender in OPEC countries. While the situation is quite different from that of the 1970's, especially as many producing

**Remaining world oil reserves**



*nb: conventional oil reserves  
Source: BP Statistical Review of World Energy, June 2005*

nations have gone through considerable economic (and social/population) changes, many producers lack macro-economic absorption capacities relevant at the current revenue streams. As a result, consumer nations are concerned about the way the excess funds are recycled in the world financial markets. The collateral damage of the 'unwise' triangular recycling of the funds in the 1970's was one important factor leading to the debt-crisis of the 1980's and bankruptcy of whole nations (and, unfortunately, to the definite installation of an IMF category hitherto known as the HIPC, heavily indebted poor countries).

The attention to the impact on developing nations by high oil prices is consequently higher this time around. While most studies see no immediate threat to the stability of the international financial markets at current oil revenues, current levels (or higher) in the mid to long-term may be a serious problem for the financial market once again.

- For a consumer nation, eying into the future to correctly see and predict the beginning of the end of oil is of tremendous importance, as oil is so deeply enrooted in the western industrialized society and economy. And, in order to pick a point, it is reasonable to assume, from a very wide angle, that oil will not be of much economic and society-wide relevance in 2050 any longer. This does not mean that all remaining reserves will be extracted by then, nor does it mean that oil would not be continued to be produced in 2050 – au contraire: huge reserves

will certainly still lie in the ground and production will still go on. However, oil prices so many years after the production peak can be expected to be so high that oil will not be used for 'burning' anymore, but rather for high-tech carbon processes/plastics (the famous comment about the end of the stone-age insinuates this logic).

As noted, there is good reason to believe that total world oil production is asymptotic – which implies that oil will most probably still be produced in 100 years (in small quantities). However, total world peak production is projected looming in only 1-2 decades, ie some time around 2020-25, after which it will plateau for quite a number of years (entering the non-conventionals) before gradual decline. That does not mean any kind of crisis, but prices are set to increase heavily (as they remain the only way to balance the market). The high level of prices will change the way oil is used and, as a consequence, lead the way out of the society-wide burning of this fossil fuel.

Consumer nations have to be strongly aware of the economic challenges that will come after the peak – mostly, because wise energy policies are needed to allow for a smooth transition into the post-oil society (in the sense as described above). At the same time, good cooperation with producers and especially a transparent approach on how to deal with demand/supply questions is necessary to accommodate all interests during these times.