Oil turbulence in the next decade

An Essay on High Oil Prices in a Supply-constrained World

Executive Summary

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EXECUTIVE SUMMARY

An analysis of the recent development of demand and supply for crude oil indicates that the mismatch in growth could cause tighter markets than we already experience today. In the World Energy Outlook 2007, the International Energy Agency (IEA) warned of a possible 'energy crunch'. But what was anticipated to happen in the first part of the next decade has been fast-forwarded to today, more than 5 years earlier, and could shake the very foundation of our energy systems if no action is undertaken.

OIL TURBULENCE IN THE NEXT DECADE

- In most scenarios, the Oil Supply-constrained world we are currently experiencing will last much longer than anticipated by policy-makers. Even when taking a conservative view on demand and supply developments, we have to assume that the oil supply constraints will last most of the next decade. Realistically, things will become worse before getting any better.

OIL PRICE

- The current high oil prices are still primarily driven by structural factors and can be explained without resorting to throwing blame at speculative investors playing the futures market or at the low dollar. Prices are mainly driven by the supply and demand imbalances and the fear that these will further deteriorate in the next decade.

- Until recently, the oil price was largely underpinned by the marginal cost of the last barrel needed to match demand, with some political and economic conjuncture mark-ups or -downs. This currently puts a structural floor of $110 a barrel under the oil price (WTI).

- The largest part of the $110 a barrel floor (about 70-75%) is determined by the marginal cost of supply, currently around $80 (building block 1). The remaining $30 a barrel (or 25-30%) is determined by supply-demand fundamentals, a short-term risk premium, and long term scarcity and policy (building blocks 2, 3 and 4). Percentage wise this distribution among building blocks has not changed much since 1990, whether the oil price was $15 a barrel, $20 or higher.

- Since the 2nd quarter of 2008, oil prices have started to deviate from this commodity driven price regime. Recent predictions of Goldman Sachs, OPEC and Gazprom expect that prices could increase to $200-250 a barrel in 2009.

- If prices are indeed heading towards $200 a barrel in 12 months' time, or for that matter even to $150 a barrel, other drivers will gain prominence over marginal costs as the main driver.

- In that case OPEC will have accomplished a long-held wish: oil will then be priced at its real value in the OECD economies, determined in the NYMEX and ICE oil futures markets.

- Such a new price regime, pricing oil at the "User Value", is brought about by the view that the current supply and demand imbalances are structural and that these imbalances could worsen in the next decade.

- In such an environment, pricing at the User Value implies that oil prices will no longer follow the rules of commodity pricing (where prices tend to the marginal cost of supply with some conjuncture mark-ups and –downs), but that prices are determined by the end-consumers in a framework set by governments.

- Pricing at the User Value implies that the oil price will not necessarily invite new supply into the market, since income requirements of producing countries will be easily met through price rather than volume.

- In this Oil Supply-constrained world, oil prices will then oscillate between:

    a) The cost of the marginal barrel of supply as determined by the most expensive barrel plus a margin for supply/demand fundamentals and geopolitical risks, driven by open markets in an OECD economic framework, and

    b) The real User Value of oil – determined by increasingly closed markets (for new reserve exploitation; for bilateral oil trade flows; for refined products), as supported by several of the major OPEC countries and Russia.

- The first price system would set the oil price at a floor of around $110 a barrel for 2008, but it is still rising (as costs are still inflating, although recently at a slower pace). The latter would drive the price up to higher levels, perhaps a super-spike of $200+ a barrel in 2009 as predicted. Already, we see more resistance to prices driven to such a level: ultimately consumers are going to revolt (the ultimate User Value).

- In any case, prices will show far more volatility – and hence uncertainty, which is detrimental to the global economy and its growth trajectory.

- In the absence of a deep and prolonged recession in major economies, it is reasonable to expect much higher oil prices based on the still worsening supply and demand imbalances. The lack of alternative fuels in sufficient quantities in the transportation sector limits the ability to switch fuels. For this reason, world oil demand will continue to grow even in a low economic growth scenario. Combined with the reluctance of OPEC member countries to accelerate their

upstream investments, the oil price will continue to test the upper limits of the price range set by the User Value of oil.

OIL FUTURES MARKET

- The purpose of oil futures markets is to send important price signals about the future price of oil (and other commodities) determined by market forces.
- Traditionally, higher price signals would be an incentive to develop more expensive oil. Currently, such price signals do not necessarily result in more supply. Instead, they test consumer behavior (the User Value) and thus determine (and destruct) demand.
- It is these latter price signals that are reflected in the current futures market, by many misinterpreted as excessive price speculation and manipulation.
- Analysis of the actual market data from the regulated exchange, which is the best evidence available to date, indicates that prices in the oil futures markets continue to be determined by fundamental market forces.
- All participants in the future market (commercial and non-commercial players – i.e. hedgers and speculators) absorb, act and react on new information and data coming available every day. Their interpretation and actions will lead to higher or lower prices. During this dynamic process prices have to find a new equilibrium.
- Current uncertainties in the global oil market, as well as the depreciation of the dollar, are clearly having an impact on the assessment of market fundamentals, and contribute to the uncertainty or risk premium to the usual analysis of supply and demand data.
- Specifically, uncertainty about the availability of supply due to political and security factors, uncertainty about the continuity of actual levels of demand growth in developing parts of the world, and uncertainty about currency fluctuations (i.e. building block 2 and 3) substantially weigh into the fundamental analysis.
- In times of great uncertainty, like today, prices might temporarily under- or overshoot, quickly (and wrongly) explained as excessive speculation.
- This process is amplified by the fact that prices are now oscillating between two fundamentally different price regimes, one set by the marginal cost of supply with some political and economic conjuncture mark-ups or -downs (i.e. a commodity driven price), the other by the real value for oil products in the OECD-economies (i.e. the User Value).

- Although there may be a possibility that – for shorter periods of time – there may be a stronger link between the positions of non-commercials and prices, they do not appear to be correlated in the long run (IMF studies).

- This is in line with our own analysis as reflected by several of the elements represented by the building blocks 2 and 3 (cyclical factors – causing large swings in oil prices on a daily basis).

- For shorter periods of time, speculators could over-react, but it is important to note that these swings in net speculative positions set the near-time oil price, but do not impact the long-term structural fundamentals, which are the over-arching driver behind today's high oil prices.

- In our view, the structural drivers represented by the marginal barrel of supply (building block 1), and - increasingly more - by scarcity and policy (building block 4) which is the main driver behind the User Value, will continue to play the most important role in the price setting of oil in the foreseeable future, driving oil turbulence in the next decade.

SUPPLY AND DEMAND

- The recent surge in global oil demand is the result of weak globalization, which has resulted in a doubling of the consumer base to 1.5-2 billion people in a period of less than 15 years. Until the early 1990s, the OECD countries represented the bulk of world demand for oil. Rising demand in the newly industrializing countries is now putting an enormous strain on the oil industry, which is struggling to sustain supply.

- So far, oil demand is much less responsive to higher prices than in the past – due to a diminishing scope for substitution (in the transport sector), a strong rise in demand for middle distillates, the impact of new regulations in e.g. the maritime sector, the unexpected switch back in oil used as feedstock to generate electricity, high excise taxes on transport fuels in the European countries providing a cushion against higher crude oil prices, and last but not least, the impact of subsidies in many of the non-OECD consumer and producer countries.

- In every likely scenario, oil remains the dominant resource for meeting global demand in the next few decades because there are no real alternative transportation fuels currently available in large enough quantities to replace oil.

- A new supply/demand outlook of around 100-105 million b/d for 2030, most likely to be published by the International Energy Agency (IEA) in their next edition of the WEO in November (versus 116 million b/d in the WEO 2007), will have far-reaching implications.

- It basically means that world oil (and liquids) supply can grow at only half the rate in the next 22 years than earlier anticipated (circa 13-18 million b/d versus 29 million b/d).

- If correct, it implies that the world will have to go through a period of substantial demand destruction – in the order of a half to two thirds of today's oil demand in the US, or up to 100% of the oil projected to be imported by China in 2030.

- A possible quickening of underlying oil field decline rates at the time deepwater oil production (circa 10% of global oil supply) goes off plateau in the first half of the next decade could make this pessimistic supply outlook even worse.

- But even with stable observed decline rates, the industry still has to bring twice as much new oil and liquids onto the market in the next 22 years than what they have done over the past 22 years – around 80 million b/d if supply and demand were to grow to 116 million b/d by 2030 as per WEO 2007, or 70 million b/d in case supply can't grow much further than recently suggested.

- Steeper annual depletion rates in the coming decade will imply that more new oil will have to be developed to offset diminishing supply from existing fields and to meet projected demand.

- This outlook of new scarcity is now exacerbated by the fact that not only available supply will determine what amount of demand can be satisfied; it will also bring about a new allocation of the available oil due to a lack of adequate supply growth compared with demand.

- In practice this means that demand rationing will be required in the OECD countries and particularly in the US, in order to accommodate growth in the newly developing countries, notably China and India.

- Different fuel prices for end-consumers in the different countries will be the dominant factor behind this 'oil redistribution'.

- Through a combination of current OPEC policies and the different price mechanisms in the different consumer regions, the OECD countries pay twice for the burden: once directly at the fuel pump, and secondly indirectly by rationing demand to accommodate the surge in oil demand in the emerging economies, where consumers benefit from subsidized prices but drive up prices in international markets.

- In parallel with the OECD countries accommodating the economic growth of emerging economies, the latter countries have to work away their oil product subsidies without triggering a jump in consumer price inflation, in order to improve energy efficiency and to reduce world oil demand growth.

- The alternative is that new and old oil consumers end up in a fierce competition for scarce oil supplies at much higher price levels, with the risk of triggering a deep and prolonged recession and possible geopolitical tensions.

OPEC'S, RUSSIA'S AND MEXICO'S RESPONSIBILITY

- Quickly rising oil prices would not be necessary if OPEC and a few other major oil resource holding countries, notably Russia and Mexico, would accept responsibility for balancing the market and take actions accordingly. At the same time, the major oil-consuming countries would have to provide security of demand to the oil producers if they commit to investing in the additional production capacity.

- The fact is that around 8 to 10 million bbl/day of medium-priced oil is available in these countries in addition to what is currently under development, but this oil cannot or will not be developed and produced for political or institutional reasons or due to demand uncertainty.

- Should such oil become available, global oil demand could be met for the entire next decade without rapidly increasing oil prices and without the challenge to global economic growth.

- Oil prices would still (need to) rise, but would do so in a much smoother and more controlled way.

- In return for the OPEC member countries, Russia and Mexico increasing their upstream investments and to unlock the 8 to 10 million b/d medium-cost oil, where needed in cooperation with International Oil Companies to share the investment risks, the consumer countries will have to arrange for suitable off-take arrangements in order to remedy the security of demand risk with the aim to equally absorb the risks among OECD countries, emerging economies and producing countries. Asking producing countries to take on the full risk of any possible (but unlikely) over-supply is not fair and is also not in the long-term interest of the consumer countries.

- The transition period from an Oil Supply-constrained World to an "Energy-sustainable World" urgently needs to be better managed globally.

- Without a doubt, the world needs more time to adapt to the new reality and should work hard to realize the innovations and to roll out the new alternative fuels – not to replace oil, but to supplement it, in order to meet the expected surge in global demand, particularly in the developing and industrializing countries.

- To avoid turbulence on the international oil market in the coming decade, the world will require OPEC and the other producing countries that still have upside

production potential to step to the plate and increase their production capacity. Without this oil, the Oil Supply-constrained World will be much more turbulent than necessary.

- The oil-consuming countries must also take their responsibility and improve their demand management policies and energy efficiency. Moreover, oil-producing and -consuming countries must share the risks and benefits of increased oil production and create security of demand.

THE IMPORTANCE OF IRAQ

- In the medium term, only one single country could counterbalance these drivers, and that is Iraq. Even if the conflict not triggered by oil, it definitely needs to be finished in a way that its oil potential can reach the market.

- Unfortunately, it does not always appear to be in the interest of some countries to help resolve the conflict.

- Once there is stability, the national oil company of Iraq, perhaps in cooperation with international oil companies (IOC's and NOC's), could start to develop their vast resources by investing in the reconstruction and modernization of the Iraqi oil industry and gradually elevate aggregate output from a little over 2 million b/d today to six or even more.

- Such an expansion of supply could bring back the price regime closer towards the marginal cost based system.

RESPONSE TO AN OIL SUPPLY-CONSTRAINED WORLD

- Being unable to force OPEC, Russia and a few other major resource-holding countries to change their (national interest driven) policies, the OECD consuming countries have no alternative than to work even harder on conservation and innovation with the objective to achieve a sustained reduction in the rate of demand growth relative to the rate of economic growth, and on developing their most expensive unconventional oil reserves and substitution. The alternative is stagnation; a reduction in the rate of economic growth as supply constraints become binding to overall economic growth.

- What is generally not very well understood is the vast complexity and scale of the oil industry that currently produces 84 million barrels of oil every single day.

- Given this magnitude, any change, any replacement of oil by an alternative fuel will take a long time before it can make any realistic impact. Whilst not different than in other industries, it often takes decades before a new innovation is sufficiently diffused as to affect productivity, and in the case of oil, to really impact supply and demand, and hence price.

- The only realistic complementary fuels today that are available in reasonable quantities are 1st generation biofuels. But even this type of fuel represents today only circa 2 percent of total global oil product demand, a percentage that is not expected to grow dramatically in the next decade, even though the use of biofuels worldwide will at least double.

- Other known alternatives to oil (besides 1st generation biofuels from sugarcane and corn) are all still in different stages of research and development and thus not able to make any relevant impact before 2020, too late to help avoid the oil turbulence in the next decade.

OIL MARKETS

- The mores of the international market and its rules and regulations are part of the American model of hegemony, something that was a given fact but has become increasingly contested by non-OECD countries.

- In the past couple of years, the newly emerging geo-economic and political powers have begun to give this model their own twist; they use access to markets, resources and intellectual property to build up their economic prowess.

- In the meantime they (try to) secure oil flows through differently structured bilateral deals with producing countries. After a period of deepening internationalization of the oil market, oil trade is already increasingly entering a period of bilateralism, where business-to-business is supported at a government-to-government level, and where several parties try to gain a privileged position over others.

- Through bilateral agreements and resource ownership with the intent to produce for a certain market only, purchasing power is no longer enough of a guarantee for access to all oil flows because of market segmentation. This implies that if new oil comes onto the market it becomes increasingly important for price development under which terms this oil becomes available: serving the international market or bilateral trade.

- This already triggers several counter mechanisms and reactions beyond the oil markets themselves, particularly in the US.

- For the OECD countries, which have put so much faith in a global, open, and integrated market system, it is therefore important to understand the dynamics of the two competing models of oil trade and development, the other being much less transparent.

THE GEO-ECONOMIC AND GEO-POLITICAL CONSEQUENCES

- The ongoing tightening of the oil supply–demand balance, reflected in higher prices, has major consequences for the wider economy and on international relations.

- These knock-on effects manifest themselves in many areas, and each of them will become more apparent in the years to come. The impact of a period of structural supply constraints will be multi-layered, namely on the micro-economic and political level, the macro level, and the geo-political and geo-economic level, each feeding into each other.

- The global challenges to manage the world economies successfully through the transition period towards an Energy-sustainable World are already substantial today and are expected to become more complex.

- The second phase of weak globalization has come with a widening credit crisis, higher inflation rates, interest rates adjustments, balance of payment imbalances, a low US dollar and oil and food price increases. In addition, the high oil prices have resulted in a large transfer of wealth from consumer to producer countries. They constitute a cocktail of instabilities that will challenge the ability of many countries to adjust their national economies to the new circumstances. This will impact their competitive position in the international economic system.

- Many of these problems will necessitate conflicting actions, making economic and monetary policy-making by the central banks, such as the FED and the ECB, extremely difficult.

- The recent oil price increase and the accompanying increase in wealth has again brought the oil-producing countries to the centre of geopolitical attention. Crucially it will be the choices of these countries regarding how and where to invest (or to withhold), and under which circumstances that will vitally impact geo-economic and geopolitical relations in the next few years.

- In principle, the world is again dependent on how the recycling of oil dollars will take place and in which direction the flows will go.

SOVEREIGN WEALTH FUNDS

- The high oil prices cause a massive money and wealth transfer from the oil-consuming countries, including the OECD countries, to the major oil-producing countries.

- In order to manage these funds, most of these countries have already established government-owned oil funds, commonly referred to as Sovereign Wealth Funds.

- Although the size of the Sovereign Wealth Funds that manage these excess money flows is already large and bound to grow, the impact of this accumulation of

wealth and power in the hands of a few governments and their elites will depend on how, when and where this wealth will be employed.

- Finding a home for hundreds of millions of dollars every year and managing trillions of dollars in investments by a handful of firms, of which many are owned by the same governments and most of them having no long-term track record or experience, will become a formidable task in itself.

- Markets only function properly when there is a free flow of information so that price discovery can take place, and when perceived risks do not deviate too much from real risks. Lack of information could cause financial instability that is characterized by valuation risks (of the asset) and macro-economic risks (of the economy at large).

- Unfortunately, many of these Sovereign Wealth Funds are not known for their transparency. It is unclear how these funds are managed and what the level of sophistication in risk management and other management policies and systems is. So far the discussions about creating more transparency have received a lukewarm response in some jurisdictions.

- If transparency about oil reserves and underlying production decline rates is an example for the expected transparency of their Sovereign Wealth Funds, expectations with regard to full disclosure of the size and asset allocation, their investment objectives and management practices and systems and their governance procedures should be subdued.

- Because OECD economies have committed themselves to the benefits of greater disclosure, regulators in the OECD should not underestimate the potential risks of loose standards employed by investors from elsewhere. OECD countries should be aware that without proper governance structures, oil-producing countries could control and optimize the flow of oil and capital in their own national (political) interests, which do not necessarily reflect the interests of the OECD economies.

- For the same reasons, the fast-growing funds with trillions of dollars under management could also go wrong unintentionally. A dissatisfactory return on investment could be another reason to prefer oil in the ground over money in a fund.

INTERNATIONAL RELATIONS

- Geopolitical tensions over energy are clearly on the rise, with accelerating global demand growth and new oil supplies increasingly concentrated in a smaller group of countries.

- In the face of supply constraints and the accompanying higher prices, the interesting question is whether producing and consuming countries will be able to muster effective cooperation to manage their way out of the Oil Supply-constrained World or whether they will end up resorting to destructive competition to secure energy and their own wealth.

- The answer to this question much depends on the place of oil and economic security in their wider geo-economic and geopolitical interests and the power of individual states to manage their oil and economic security, through organizing the availability of alternative liquid energies and/or through securing oil flows through the market or bilateral arrangements and/or through securing income from oil.

- The space that the traditional energy consuming countries have to make to accommodate the growth of energy demand in emerging economies in Asia and elsewhere is substantial.

- An affable redistribution of oil towards emerging economies depends on the ability of particularly the US and Europe to move away from oil. But voluntarily moving more quickly along the transition path, if at all technologically and economically possible, is unlikely without politically addressing the potential accompanying impact on the dislocation of employment and production if this is done in an open trading system.

- The intensity of competition to secure oil flows, with the danger of spilling over in strategic and geopolitical rivalry, will be determined by the size of the supply and demand gap and the ability to intervene in energy flows.

- The tight oil or liquids balance is bound to result in more nervous and sometimes confrontational relationships between the major consumer regions and the natural resource holding countries, as well as among the major consuming countries themselves.

- New geopolitical games to secure the natural resources for their domestic economies and to diversify and secure the gateways to their markets already have become an important part of oil consuming countries' political and strategic agendas.

- Yet, our defense organizations and the military disciplines will respond with new policies, systems and programs when traditional energy security policies become less effective.

- Trust and mutual understanding about the allocation of oil and the security of supply will not come automatically, but instead needs to be constantly reconfirmed.

- The leaders of the main economic and political powers have to come up with a plan that guides us through this difficult period of transition and redistribution of oil scarcity. If they fail to do so and instead opt for a competitive solution, the nasty side effect of oil scarcity could be a confrontation in and over oil-producing countries in Africa, Central Asia and the Middle East, leaving many countries to scramble for whatever oil supplies they can lay their hands on.

- Much will depend, therefore, on responsible leadership among the leading nations in this scramble for oil and other liquids.

THE JEDDAH ENERGY SUMMIT AND SUGGESTED ACTIONS

- The Jeddah Energy Summit was held at the invitation of King Abdullah of Saudi Arabia on 22 June 2008 and brought together representatives of OPEC countries, other main producing countries, and important oil consuming countries (from the OECD and emerging economies). Saudi Arabia took the initiative to put the issues leading to the current oil market situation on a joint international agenda. His is a very important initiative which deserves a serious follow-up.

- We applaud the Joint Statement by the Kingdom of Saudi Arabia and the Secretariats of the International Energy Agency, the International Energy Forum and the Organization of Petroleum Exporting Countries[1].

- It has become clear that too much is at risk to leave the current geo-economic, geopolitical and monetary challenges to run its own course in the years to come[2].

- Instead, the Jeddah Energy Summit should be continued in a formal setting and on an annual basis. The follow-up event planned for the end of this year in London underpins this proposal. Such event can be best organized by the three most important institutions in the field of oil and energy: the secretariats of the IEA, OPEC and IEF. In addition, the agenda should be expanded to inter-related topics that are directly related to high oil prices.

- Several actions could already be taken today in addition to the statements made in the Joint Statement:

[1] Joint Statement by the Kingdom of Saudi Arabia and the Secretariats of the International Energy Agency, the International Energy Forum and the Organization of Petroleum Exporting Countries, Jeddah Energy Meeting, 22 June 2008. www2.iefs.org.sa/Pages/home.aspx

[2] Many of the issues addressed at the Summit are also addressed in this essay. A draft of this paper was circulated among a some of people that participated in the Jeddah Energy Summit and we are grateful for their very useful comments. The views expressed in this essay, however, are those of the authors.

- The global upstream investment framework has to be dramatically improved. All economic, political and technical barriers that frustrate (more) upstream investments in all major oil producing counties have to be identified, discussed and taken away. Accompanied risks in the oil sector have to be lowered, mitigated and resolved.

- In this respect, OPEC and the major oil producing countries have to accept the new reality: without developing more medium priced oil, the Oil-constrained World will be much more turbulent than necessary. An announcement to this effect can calm today's frenzied oil markets substantially.

- In return for more investments, the major oil consuming countries have to share the (unlikely) risk of over-supply, by providing mutually acceptable guarantees that in case there is some oversupply, the burden will be shared pro-rationally.

- In addition, commercial stocks in the major consumer countries have to increase substantially, preferably on a voluntary basis, but if needed through regulation. These additional oil stocks have to be seen as a complementary base to the spare capacity held by Saudi Arabia and needs to be managed in close cooperation between the main holders of these stocks and spare capacity. In addition to the benefits of having higher oil inventories in the main oil consumer countries and to share the cost of these extra oil inventories between OPEC and consumer countries, it will also help to reduce oil price volatility in the front-end of the price curve.

- Within such a new framework that is less hostile for upstream investors, OECD countries can and must further develop more energy efficient solutions through conservation, innovation and substitution, not to replace but to complement oil.

- In parallel with the OECD countries accommodating economic growth of the emerging economies, the latter countries have to work away their oil product subsidies, without triggering a jump in consumer price inflation, in order to improve energy efficiency and to reduce world oil demand growth.

- In return for accommodating their growth, hard agreements should be made between OECD countries and China and India in the area of CO_2 reductions.

- Bilateral oil trade for a certain markets only, outside the well-established international oil markets, should be avoided.

- The focus of investigations of the role of Sovereign Wealth Funds should be shifted from where and in what sectors they are going to invest in how they invest and manage their investments.

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