



**“The Oil Supply and Demand Context
for
Security of Oil Supply to the EU from the GCC Countries”**

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April 2, 2005 Kuwait City**

Background

The following note was presented to the final wrap-up conference for “EUROGULF: An EU-GCC Dialogue for Energy Stability and Sustainability”, held in Kuwait City, April 2-3, 2005. The note draws on a paper by Dr Robert Skinner and Dr Robert Arnott, Senior Research Fellow at the Oxford Institute for Energy Studies, prepared as part of the EUROGULF project carried out under the European Commission’s Synergy Program by a consortium under the coordination of the Robert Schuman Centre for Advanced Studies, European University Institute, Florence. The larger report appears on the OIES website as [WPM29.pdf](#).

**Notes for Remarks¹ to Eurogulf Conference, Kuwait City, April 2, 2005
Dr. Robert Skinner**

Introduction

Within the broad framework of examining the economic and political conditions relating to the EU's energy security, we were asked to examine several propositions relating to the oil supply response from GCC countries given expectations of world prices and demand, and to assess whether there was some optimal price band that could "guarantee energy security in the long term".

Much has changed in the world oil market since we started this project in early 2003.

Demand is a key consideration for such an exercise. We simply assumed that it would continue to grow. Although this can be debated and scenarios of demand-collapse could be contrived, this was considered not appropriate for this exercise.

Demand growth is certain over the long term, but uncertain in the short term. The inverse is the case for Supply: certain in the short term, less so for the long term. This asymmetry is reflected in their estimation by the IEA and others over the past three years, with demand underestimated by more than 3 Mb/d and non-OPEC supply over-estimated by up to 1 Mb/d 6 Quarters forward. This is merely an observation, not a criticism, but it underscores the critical importance of information, its accuracy and above all, its correct interpretation.

We took the pragmatic view that the GCC group comprises essentially hydrocarbon-based economies and therefore its trade relationship with the EU, at least for the foreseeable future, will be based directly or indirectly on hydrocarbons and related industries and services.

We assumed

- 1) Non-OPEC would continue to maximize supply within the limits of price and resource accessibility; and
- 2) OPEC and therefore GCC members would continue to be marginal suppliers.

We did not use a model. We grounded our analysis in the empirical data of the recent past and projects under development today, and tenuously stepped out into the future as far as the data let us.

Thus, we took the view that if the GCC region's prospects in the broadest sense, including for economic diversification, depend on its hydrocarbons, then we needed to look 'Outside'—to reasonable assumptions of demand for oil and to reasonable expectations of what other producers of oil and oil alternatives might do, in order to begin to have some view on the space in the oil market that GCC countries might occupy and the challenges they might face in doing so.

A brief word on Energy Security

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Because this study stems from the European Commission's perennial preoccupation with **energy security**, we thought it useful to review the subject. But it is always essential when invoking energy security as a rationale for policy, governments need to understand precisely what they mean by 'energy security'. They soon find that it defies definition. Ultimately it comes down to whether or not one feels secure, therefore we have to give up seeking some quantitative or theoretical construct and turn to more qualitative indicators of security of supply and security of demand.

In reviewing the subject we soon find that it has many ironies and paradoxes.

- The much discussed notion of the 'oil weapon' offers many ironies—the weapon, if there is such a thing, has been used by producers against producers but mostly by consumers against producers in the form of sanctions, and rarely by producers against consumers.
- Policies to get off oil, such as building nuclear in Japan, have led to a temporary dash back to oil when safety questions closed a major Japanese utility's nuclear units.
- The U.S. and Europe once considered natural gas too precious to be used as fuel. This policy was later reversed. Within a few years, gas was looked to almost exclusively to fuel new power plants; now, in the US and the UK, two competitive gas markets that 'dashed for gas', the looming requirement of gas imports is raising old ghosts of energy security.
- Finally, most interruptions of supply originate within countries owing to industrial action, internal political disputes or mechanical failure.

But energy security, indeed the security of supply of any essential good or commodity, is a serious subject if only because it attracts so much political attention. Therefore, it is essential that we understand what circumscribes its seriousness and here we find that **context** is critically important.

- This varies depending on the particular traded energy commodity (electricity and gas, the energy delivered to us on grids, has different security elements than does crude oil, which is fungible. The co-dependence between supplier and consumer varies among these three major energy sources;
- It changes with time,
- It depends on the parties' understanding and views of the market,
- Technological change can alter the context, and
- Above all it depends on the broader economic, strategic and political relationship between the trading parties.

If we follow the evolution of the IEA's statements since the seventies regarding energy security and the Agency's prescriptions for its achievement, we confirm just how important the changing context really is.

- **1979 Policy Principles** (picking winners—coal, nuclear, conservation; designating losers—gas and oil);
- **1993 Shared Goals**—developed as a template for policy in OECD countries at a time when economies in transition and other countries were seeking policy guidance; this was during a period of surplus supply and capacity, when reliance on markets, efficiency and diversity offered easy appeal to politicians;
- **Y2K**—underscored the importance of technological preparedness;
- **Post 9/11**—brought the concern of terrorist threats to large energy supply systems;

More recently, the IEA has expressed concern about **Choke Points** through which oil and LNG moves in the ever increasing volumes; the adequacy of **Investment, major power Blackouts** and the **Transparency of Oil Reserves**.

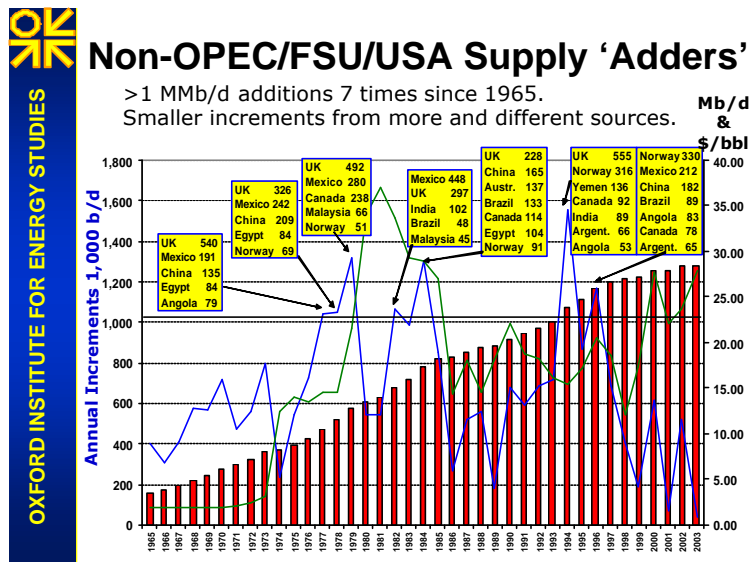
This is not to question the Agency's changing emphasis—that largely comes from the political developments and perceptions within its members' capitals—but simply to point out that our perspective on energy security depends very much on where we stand, when and with whom. It follows therefore that maintaining the relationship is critical.

The Middle East and its perceived instability has been a salient in utterances on energy security ever since oil was discovered in the region, this—it needs to be noted—notwithstanding the fact that Gulf producers have supplied the market when production was withdrawn or interrupted in the region or somewhere else in the global supply system.

Thus, the EU will have to continuously re-examine its political and economic relationship with the GCC to create the conditions for improved mutual understanding and therefore a greater sense of security regarding energy trade between the regions.

Future Non-OPEC Supply

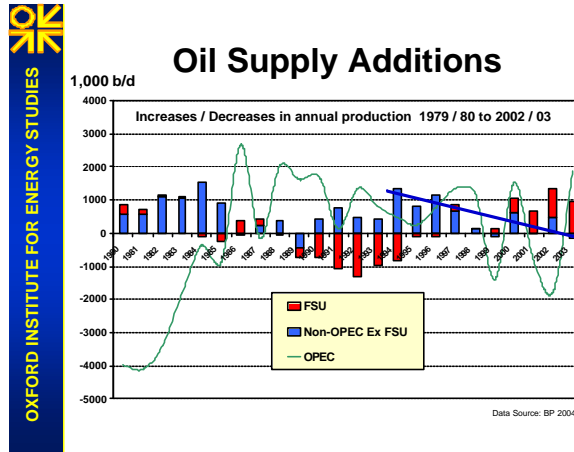
In order to understand the potential of Non-OPEC we looked at its past performance. Which countries played a role in displacing OPEC and which countries might hold the potential to do so in the future?



This graph provides some detail on those **Non-OPEC/Non-FSU/Non US** producers since 1965 and their incremental production against a background of oil prices.

This group of 40 or so countries managed to add more than 1 mmb/d incremental supply 7 times since 1965. Four of those 'good years' occurred during the high price years 1977 to 1984. The other two occurred in the mid-nineties with the second wave of North Sea production aided by several small 'adders'.

We might be seeing the beginning of a plateau in this group's output—at least until they start responding to the recent increase in oil prices.



This slide illustrates the decreasing increments from all Non-OPEC outside FSU since the mid nineties and underscores the dominant influence of the FSU since 1996, with the obvious supply roller-coaster that OPEC has had to manage as a consequence.

Our conclusion is that there are few countries outside the FSU that have the potential to have a material impact on Non-OPEC supply proportionate to the contributions during the pre-1986 period from places like Alaska, Mexico and the North Sea.

So much for the past.

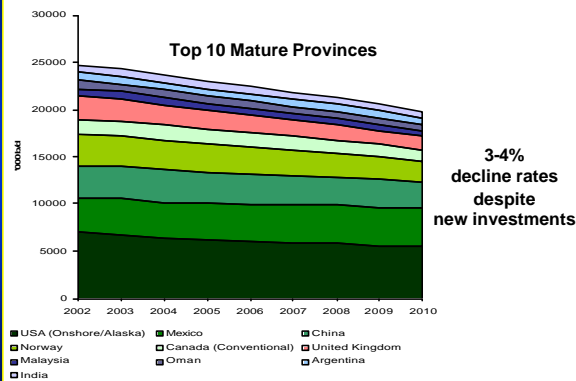
We then took a closer look at the potential for Non-OPEC supply, but rather than taking a bottom-up country by country approach, which tends to mask the major, high impact contributors and the profile of their specific contributions, we took a play approach. In this way, we can begin to understand some of the key issues associated with any set of assumptions about the contribution of a particular play as it is pursued in different countries.

We chose 5 categories.

- 1) **Mature (where depletion is a major factor)**
- 2) **Russia (a unique political and economic situation, rather than a 'play')**
- 3) **Deepwater (Where most non-OPEC growth is forecast)**
- 4) **Frontier (under active exploration and in some cases, development)**
- 5) **Unconventional (includes several categories)**

There is another important category that we did not set out and that is **NGLs**. They are and will continue to be important especially given the expected rapid development of gas fields, most of which are wet. NGLs will displace crude-derived naphtha in petrochemicals and to some extent will replace motor fuels. Too often we overlook the interplay of oil and gas and NGLs through the petrochemical sector and the influence its business cycles have on the production and use of naphtha and NGLs.

1. Mature Provinces



Mature Provinces

Shown here are the top ten mature provinces but there are many more relatively small contributors, altogether producing a little over 31 Mb/d in 2004

For provinces such as US we have excluded the contribution from the deepwater offshore.

We assumed an average decline rate of 3-4%. Some provinces are declining faster; some slower (e.g. UK decline rate is running at around 8-9%).

The decline rate has accelerated slightly in recent years but it is not clear yet whether this reflects:

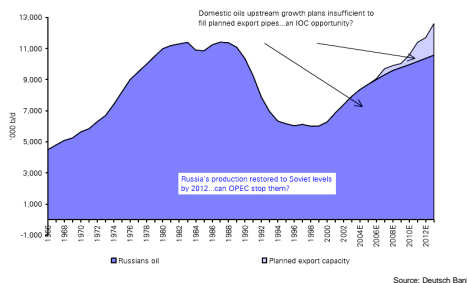
- Lack of investment in existing provinces
- Acceleration of decline rates due to improved technology
- Maturity of provinces

With high oil prices there is an argument that greater investment in these provinces might affect the decline rate. For onshore basins we should expect a fairly fast response but it will not be significant since these basins offer very few options.

Russia

2. Russia

Great uncertainty and all forecast exceed Russian government forecasts



All projections of Russian production remain problematic. Consensus forecasts point to recovery of production to Soviet levels by 2020. This depends as much on political as on technical considerations.

For several years it has been expected that once production is restored to about 9 or 10 mb/d, it would begin to level off. This appears to be happening but it is difficult to screen out the effects of recent political developments in Russia. Meanwhile it is an attractive 'material' opportunity for major POCs but there is general recognition that investment now, even if entry were possible and attractive, would likely not reap rewards for some time (>5 years).

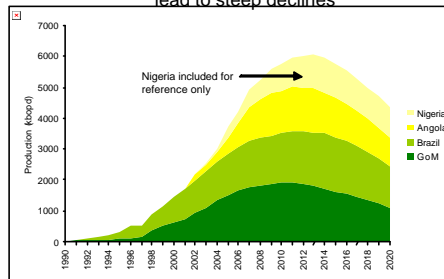
An interesting and important question is whether Russia would cooperate with OPEC should prices fall. That Russia might find convergence of interest with OPEC in oil markets is probably answered by the importance to its economy of its oil exports and oil-priced gas exports and subsidized domestic hydrocarbons. In any event, should oil prices fall, then some uneconomic Russian production would likely be shut in.

Deepwater



3. Deepwater

A near term bonanza but aggressive development could lead to steep declines



The deep offshore will be the source of the most dramatic growth over the next 5 years but growth is not assured beyond 2014.

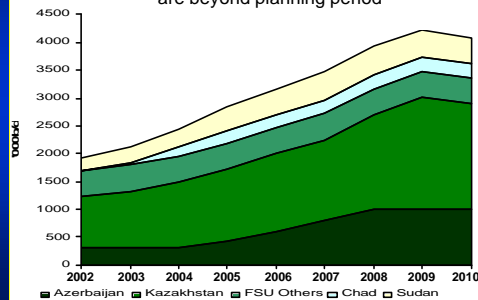
Growth comes primarily from West Africa/Gulf of Mexico/Brazil. Aggressive development of these fields leads to a high but short-lived plateau production but accelerates the decline.

There is increasing evidence that the largest discoveries have already been made, but we could be surprised and there are other deep basins to be explored.



4. Frontier

New exploration provinces such as Arctic, East Siberia are beyond planning period



Frontier

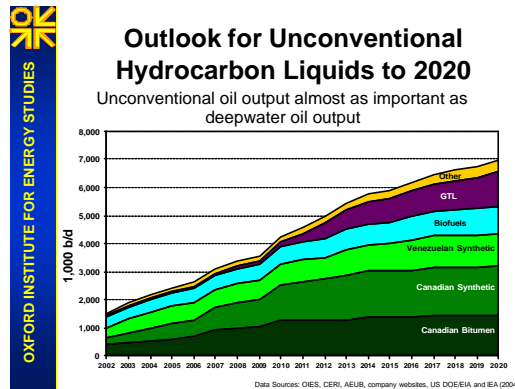
This category captures all other areas where significant production growth of conventional oil is anticipated over the next few years. It also encompasses potential

exploration success in provinces such as the Arctic. However, production from these regions is not anticipated within the period of our outlook.

Most of the growth in this category is expected to come from the Caspian region; namely, Kazakhstan (e.g. Kashagan field) as well as the build up in production from the Azeri-Chirag-Gunashli field offshore Azerbaijan.

The fifth category is **Unconventional Liquids**. These include:

- 1) Canadian Athabasca oil sands
- 2) Venezuelan Orinoco output (there are other ultra heavy oil projects underway, but most of these are in decline),
- 3) Biofuels (ethanol and biodiesel).
- 4) Gas to Liquids and
- 5) Liquids from Shale, Coal and organic wastes (very minor)



The Oil sands and Orinoco projects are believed to be reasonable estimates of what can be expected.

Biofuels are noteworthy from the perspective that they are growing very rapidly. This is not necessarily bad news for fossil oil since some Biofuels, in particular ethanol from maize, consume as much or more conventional energy to manufacture it as is contained in the final product. This is not the case for the sugar cane-based ethanol in Brazil, already around 230 kb/d. Over two dozen countries have Biofuels programs, but these are essentially rural social support and agricultural subsidy schemes. But, if any thing, this gives them great political momentum.

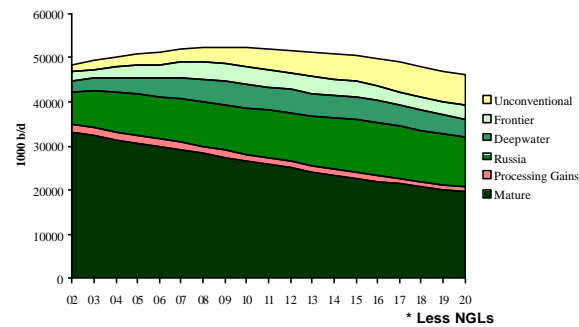
GTLs deserve special mention as more than half of the talked-about projects are slated for GCC Qatar, which aspires to be the GTL capital of the world. We assume that about 80% of the volumes projected will come on stream but at a much slower pace than their sponsors are projecting.

Summary of Non-OPEC supply

Our assessment of non-OPEC supply is that it will peak at 52.3 million b/d by 2008-2012. Our assessment includes processing gains and excludes NGLs. **NGLs** could add another several million b/d by 2015 or so.

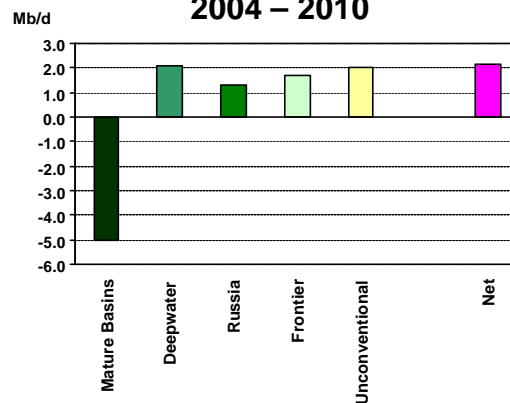
Outlook for Non-OPEC production 2002-2020

Non-OPEC forecast to peak around 2008-2012 at around 52.3 million b/d*



This assessment turns out to be similar to consensus projections but has been derived a different way!

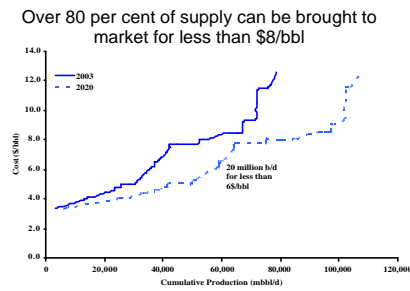
Supply Contributions 2004 – 2010



The net contribution to 2010 is not that significant given the assumed decline rate for the base in the mature provinces. This rate is critical: to the extent investment in these basins increases, the net will increase. Meanwhile, all of these Non-OPEC sources of supply face to varying degrees economic, political, environmental, technical and institutional barriers, as well as incentives.

Price bands: is there “an optimal price band”? This subject comes from the proposition that there might be some price band that could make both producers and consumers happy and feel secure.

Development Costs Have Fallen



Early in the project we derived current and future development cost curves of global supply up to a potential of 105 million b/d. The Cost Curve for 2003 shows that over 80% of current production had been brought on stream at less than \$8 per barrel.

The Cost curve for 2020 shows that over 90% of production can be brought on stream at less than \$8 per barrel. This of course merely reflects the assumption that a greater share will come from low cost OPEC countries and points to the perverse exploitation of the world's oil resource pyramid.

While this represents the actual development cost, the minimum price required on average would have to be higher in order to give investors a satisfactory rate of return. Were we to do these numbers again today, we might say the cost would be more like \$12 or \$14/bbl. In any event, oil prices would have to fall significantly from current levels in order to seriously slow investment in new production.

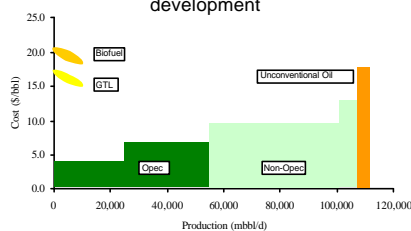
It is more likely that companies increasingly will be opportunity-constrained than financially- constrained. This is a reversal from their situation in the nineties.

Most non-OPEC is now within \$2 per barrel of OPEC production but this differential might start to open up again with high prices (i.e. non-OPEC producers chasing high cost fields in an environment of higher commodity prices (steel, rig rates etc...)).

The fact that global supply cost is just \$8 per barrel whereas the oil price (WTI) has consistently been well above this cost demonstrates the historic role of OPEC in being able to influence prices. It also reveals that cost is only part of the equation.

Cost of Non-OPEC Supply

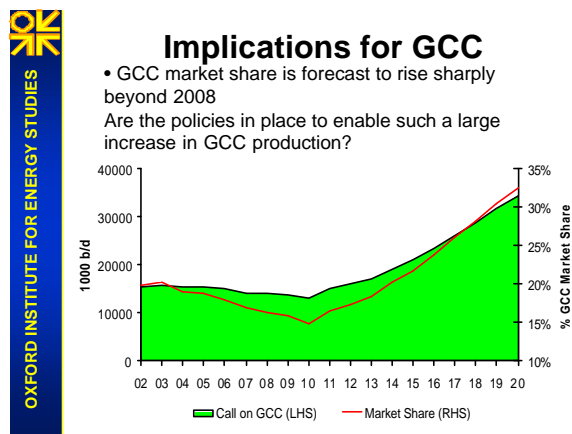
At oil prices in excess of \$30/bbl other factors are more important in determining timing of development



Summary of non-OPEC supply shows that most forms of oil both conventional and unconventional can all be brought on stream if prices are maintained above \$25 per barrel (WTI)

Therefore other factors (technical, fiscal, economic, capital availability etc) will determine the timing of development.

Unless prices retreat from current levels there is every chance that investment in non-OPEC opportunities will continue and perhaps accelerate.



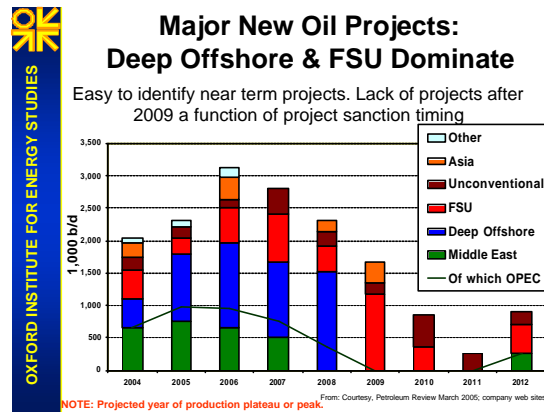
To summarize the picture in terms of implications for the GCC, we added together estimates of

- 1) Non-OPEC production
- 2) OPEC production outside of GCC
- 3) We then subtracted this from consensus estimates of global oil demand to obtain a figure of how much oil the GCC countries will need to supply over the next 15 years.

Estimates of OPEC outside of GCC production are assumed to be essentially unconstrained with new production on stream from Nigeria (deepwater), Algeria (aggressive new developments), Libya (new licensing rounds) and Venezuela.

Analysis suggests that GCC countries, in particular Saudi Arabia, having made great efforts recently to increase production, could come under pressure to cut back production over the next three years (that is, face having more than desirable spare capacity). But this will likely be a temporary condition, brought on by a grouping of project decisions made long before the current oil price increase. Nonetheless, it will challenge OPEC discipline, especially if the growth in world oil demand eases off.

We can hold a closer lens to this near term oil supply question. In the very near term, there is the worrisome prospect of expanding inventories driven by the *Contango* in the front end of the forward market and signs that the non-commercial traders are reducing their long positions. Further out in the 2006 to 2008 period there could be a flood of new Non-OPEC supply due on stream as shown here.



These are the large projects that we know are under development. There are nearly 100 projects in this compilation. Most of the conventional oil supply projects are larger than 100 kb/d. It does not include over 30 potential projects not yet sanctioned for beyond 2010, which would have the potential to add another 4 to 5 mb/d in gross.

- These are GROSS additions, thus do not reflect the decline of the base from under these additions;
- But they do not include small projects and growth in some mature basins.
- While the graph shows the combined year of peak or plateau, it must be stressed that delays will likely change the profile of this curve—it could flatten or compound the peak in 2006 or later.
- Companies are becoming more conservative in forward looking statements so the ultimate plateau or peak volumes might be understated.
- The further out in time, the volumes and timing of projects become less reliable.

In any event, 2006/07 could see the largest Non-OPEC increment of supply in history, perhaps approaching 2 million b/d.

It must be stressed that this supply surge has nothing to do with the price increase since 2003. In fact, these projects have their roots in the nineties, a period of low prices. This was a time when many oil producing countries sweetened the fiscal terms applying to hydrocarbon development to attract investors in a very competitive international E&P environment. Also, it was a time when new geological concepts (turbidite sands and sub-salt play) had been conceived of for the very deep water regions and enabling technologies were developed to exploit them. Finally, it was a period of fundamental political change whose roots go way back to the late eighties—the collapse of the Soviet Union.

It is important to remember that the nature of this supply, 70% from offshore plus large unconventional plants, will be increasingly lumpy. This further compounds the challenge for GCC countries, as it will contribute to price volatility, especially in periods of tight supply; and they can be shut down owing to storms and other events, and when they go down, significant volumes of supply are taken from the market.

Meanwhile, we cannot rule out current prices eroding the growth in demand. There are already signs of this happening or at least its imminence. Prices are being flowed through in countries like China, Vietnam and Indonesia and manufacturers in the US are beginning to pass on their oil-linked higher input costs to buyers; central bankers are increasing interest rates and in this respect, the United States' fiscal and external imbalances remain a worrisome black cloud for the global economy.

So, depending on demand, OPEC/GCC's challenges in achieving its goal of price stability could be considerable.

In conclusion,

- 1) The prospects for supply from the GCC and therefore its economic prospects and potential for diversification depend largely on developments outside the region and how they affect the markets for hydrocarbons.
- 2) There is at best a very broad price range somewhere between about \$12 and \$50/bbl that will assure supply and demand but the closer and longer the price approaches these limits, the less stable it will be.
- 3) Energy security cannot be guaranteed. But it can be reinforced by ensuring that the political and economic context between the EU and the GCC is as free of misunderstandings as possible.