THE END OF CHEAP OIL

Opportunities and Consequences

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Mr. Chairman, distinguished guests,
Let me first start by thanking the organizers of this meeting for inviting me to this very prestigious gathering, indeed I am happy to be able to join you today sharing with you some thoughts regarding the oil market and its present and future likely behavior.

As you are all aware, during the past few years, oil prices have been rising steadily, with some volatility from time to time. Since 2002, OPEC's member countries have increased production by about 4.5 million bbl/d in an effort to stabilize markets. Despite OPEC's efforts, oil prices continued to increase reaching unprecedented levels. When oil prices went over $50/bbl, many analysts predicted slow down of the world economy and even recession, higher inflation, and rising unemployment. To the dismay of many, none of these predictions happened. The world economy acted as if it was immune against this surge in oil prices and sailed on seemingly

unaffected. Even the fragile economies of the world's developing nations did not suffer the devastating consequences that many analysts had predicted.

When oil prices were heading towards $70/bbl, analysts again predicted not only slow down of world economy but deep recession with grave consequences and hardship for all nations developing as well as developed. Instead, demand for oil continued to rise despite the fact that oil prices surpassed the $70/bbl mark, and predictions of even higher growth rates of the global economy in 2006 were voiced. Not only do many analysts now think that oil prices will remain high in the near term but some even advocate that $70/bbl oil is still cheap, and even suggest the prospects of $100/bbl oil. They argue that comparing recent oil prices in real terms with oil prices in the past indicates that the price has yet to hit again the $90/bbl peak price recorded back in 1980. So, for some, $100/bbl oil may still be cheap after all and as such, the world economy can still cope with this price.

Having said that, I would like to turn now to the fundamental question: **What is keeping the oil price high?** The simple answer to this question should be first and foremost **strong world oil demand, in fact we can see this growing demand very evident in China, India, and the USA,** this is coupled with dwindling spare production and decreasing economically recoverable reservoir capacities. In fact other factors such as lack of refining capacity, geo-political uncertainties, market speculation, and natural disasters are not important too. Under the current circumstances the geo-political problems are the most important of these factors, simply

because of the uncertainties and supply disruptions that are created. Furthermore, serious concerns exist about future supply-demand imbalances. Many analysts are raising these concerns. Some are even raising doubts about the collective abilities of the oil exporting countries in general and the OPEC countries, in particular to deliver the increasing volumes of oil needed in the future, by the biggest and fastest growing economies of the USA, rest of the OECD, China, and India.

The question of peak oil output, which once was the concern of few individuals, has become the concern of some countries, as well as organizations. Despite the fact that many are unhappy with Hubbert's peak oil predictions, his 1970 peak oil theory for the USA turned out to be quite accurate, and for many, particularly the pessimists, his end-of-the-century peak oil predictions for the world also proved to be correct. However, while some of the more pessimistic oil specialists are declaring that peak oil has already been passed, or at best is here now, others who are less pessimistic believe it is not going to arrive before 2010. On the other hand, the optimists give the world a little more breathing space, that is to say up to 2020, and perhaps even up to 2030. However all in all, most would appear to agree that peak oil output is not very far away for all of us. It could take place sometime within the next decade or so, which in fact means that there is not much time left for a world economy to be driven largely by oil. Furthermore, under any of these scenarios, and since peak oil output is not about the time at which oil will run out, but the time at which production can no longer be increased to cope up with increased demand, it seems the only way the oil price can go is up. This conclusion seems to be in line with the view held by the peak oil output advocates who argue that the ongoing oil

price rises are mainly due to supply-demand imbalances caused by the fact that we are at or near the production peak of world oil if not, on the downward slope of Hubbert's peak curve. This is not to deny the role of other factors specially the geopolitical factors and tensions, but only to stress the importance of supply and demand for crude oil as the prime factor in determining the price of the commodity.

Tied very closely to the issue of rising oil prices is also the supply-demand imbalance for petroleum products. The product issue is arising because of global shortages in refined petroleum products capacity. Lack of capacity means the existing refineries are not able to cope with increased demand, particularly being unable to meet the demand for light refined products for the transportation sector. In addition, refiners are also not as able to handle the increasingly more sour crude mixes being supplied by the producers to the oil refining market. The uncertainties, risks and need for investments surrounding refinery expansion and upgrading both globally and in the USA in particular are also important factors in making the overall energy market situation tighter.

Oil producing countries try all they can to alleviate the oil market imbalances by using most of this spare capacities. This has also led to aggravating the situation further and to increased escalation of the oil price because it created more uncertainty by giving the clear sign that there is not much more oil output capacity available to meet future increases in the demand or any shortages of supply. Attempts to put more recently discovered oil fields into production, to improve recovery levels from existing oil fields, and to resort to un-conventional oil resources such as

heavy oil, bitumen and tar sands, may help reduce oil prices rising as much in the short term but in the longer term these measures alone will not be able to keep up with increased global demand, and consequently price increases will continue. Some analysts now say that nothing, short of a major world-wide economic recession, or series of recessions, in the major consuming markets, occurring naturally, or being man-made, can turn the price of oil down by just severe cuts in demand.

So, what can we conclude from this?

First, it is highly likely that $20/bbl or even 30/bbl oil is a thing of the past.

Second, if current supply-demand imbalances both for crude oil and for refined petroleum products persist, and there is no reason for this situation not to persist, then, one can only conclude that a return to $40-50/bbl seems quite unlikely. Even though there are some who would still disagree and would hope to see the price of oil falling, even below $40/bbl, they also say, the history of the oil industry is characterized by volatile changes in price.

Third, $\$70^{+}$/bbl oil may be quite likely if the world economy continues to grow at the rates experienced in 2004 and 2005. These rates may cause the demand for oil to increase proportionally and it may even start to exceed available supply. If the tensions in so many areas of the world especially in the Middle East are not reduced and disrupt some supplies, a noticeable gap in supply and demand will occur earlier than the revised Hubbert type analysis would suggest. From what we see currently tension is increasing, especially in some oil producing regions affecting

more nations and the world economy is still growing at the higher rates. These two factors lead many to believe that this is the beginning of the end of the era of "cheap oil".

Based on the previous conclusions, and although there are of course some negative consequences of persisting high oil prices and the "end of the era of cheap oil", there are also a number of positive consequences, or more appropriately "opportunities" that arise. High oil prices can lead to first and foremost, more aggressive exploration and production policies by the major international oil companies, as well as the national governments of the oil producing countries. However pursuit of such policies entails monumental financial commitment of the type required by truly enlarged exploration and production programs. Equally true, high oil prices make enhanced oil recovery methods more economical and stimulate interest in revisiting ageing reservoirs. This would contribute to increasing the total supply of oil in the short term. High oil prices also help continue to improve petroleum-engineering practices aimed at recovering most of the oil from existing reservoirs as well as improve the feasibility of recovering more of the oil from the deeper offshore waters in some parts of the world.

Higher oil prices would also help bring more natural gas to the energy market in the form of LNG supplies from areas that have abundant gas reserves and are distant from the energy consuming markets. Natural gas can be converted to hydrocarbon liquids suitable for the transportation sector using GTL (or gas to liquids) technology. Also, under the high oil price scenario, clean coal technology can be more competitive, particularly where

technology can convert coal to liquid fuels for use by the transportation sector.

Another positive aspect of high oil prices would be to bring more non-conventional crude oil resources into the market such as the tar sands in Canada, the heavy oil or bitumen in Venezuela, and the oil shale in the USA. As an example, due to improved economics and higher oil prices, Canada's production of synthetic oil from tar sands has grown significantly in the past few years. Tar sands production now represents about half of Canada's total crude oil production, or about one million BOE/D, and subject to the prevailing oil price, it is expected that production will triple and even quadruple by the year 2020. However, for Canada to realize this potential, serious obstacles must be overcome such as the huge investment costs involved. Tremendous quantities of energy and water are required to process the tar sands, there are manpower requirements, and environmental concerns related to CO2 emissions and land reclamation also. The same types of issues can be said to arise for the recovery of large deposits of heavy oil, or bitumen in Venezuela, as well as for the huge oil shale resources in the USA. As the price of oil rises, these resources become more attractive and may in the long run contribute more significantly to the total world oil supply.

To put matters in a proper perspective to assess the significance of non-conventional crude oil resources, it is worth noting here, that according to some estimates, the world has over twice as much supply of heavy oil and bitumen than it does conventional oil. By not including hydrocarbons in oil shale, some estimates claim that there are 8-9 trillion barrels of heavy oil and bitumen in place worldwide, of which potentially 900 billion barrels of oil

are commercially exploitable with today's technology. Canadians estimate their bitumen resources to be around 175Billion BOE, which can be processed with today's technology. This would make Canada second only to Saudi Arabia in proven oil reserves in the world. However, this figure remains controversial and more cautious estimates suggest in the order of 17Billion barrels may be recoverable, but at what price.

As for renewable energy sources such as solar, wind, geothermal, etc., high oil prices can encourage their development considerably. The contributions of renewable energy sources to the world's energy mix could rise significantly to levels that can help in easing the impact of future oil supply-demand imbalances. However the technology based developed countries must invest seriously on renewable energy technologies and sources and encourage their utilization and conversion programs, not only by their own economies, but by the economies of the developing countries to make progress. The developed countries must assist the developing countries both financially and technically in their efforts to use more renewable energy sources and to not waste energy. Many energy analysts are relying more and more on the contribution of renewable energy sources and energy saving methods as the way forward, but the world economies are running currently on the finite and depleting energy resources oil and gas.

Last but not least, a word or two about the impact of oil prices on nuclear energy? Certainly the nuclear industry will benefit from the end of cheap oil. However, the future of nuclear energy as an alternative energy source for supplying electrical power generation and heating is not only an economic issue; rather, it raises environmental, social and political issues.

Therefore, while nuclear energy can and does play an important role as an alternative energy source in power and heat generation, its use is also a matter of severe political and location constraints, less than offsetting specific oil supply-demand imbalances. Furthermore, nuclear energy's use exclusive club is not open to all nations. Therefore, its utilization will be limited only to those allowed to join this exclusive club and having the abilities to operate these facilities and deal with decommissioning and waste.

So, many oil-producing countries are doing, or trying to do their part in improving the oil supply output. My country Libya, which started exporting oil in late 1961 in less than one decade to 1970, was able to produce more than 3.5 mb/d. The exports then decreased due to embargoes sanctions and a boycott, which my country was subject to for political reasons. Consequently our production went down to less than half of what used to be produced. This in fact means that there is now still much potential in Libya for more discovery and development. We have solved a number of problems and Libya is open again to more foreign companies to participate in these improvements. Recently, Libya encouraged more than thirty companies to operate in the country after winning exploration blocks, through two rounds of open bidding and competitive procedures. Some of these companies have started their seismic and drilling works, and some of them were able to make new discoveries. Now the third open bid round for exploration has been announced, and judging from the expressions of interest shown by the companies to participate in this third round, Libya looks forward to another successful outcome. We believe that with the planning and incentives now on offer it will not be long before Libya's production capacity again reaches two million barrel a day by mid 2007 and

three million barrel by the year 2010. It is not only the oil production potential of the country as an important source of hydrocarbons, which makes international oil companies interested in Libya, but its also the geographical location in the Mediterranean and its proximity to the European markets which gives Libya an added economic advantage. We hope to help to delay slightly the Hubbert peak output production date with the help of the organizations investing in Libya. Thank you.