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Global Energy Resource Supply: Strategic Trends

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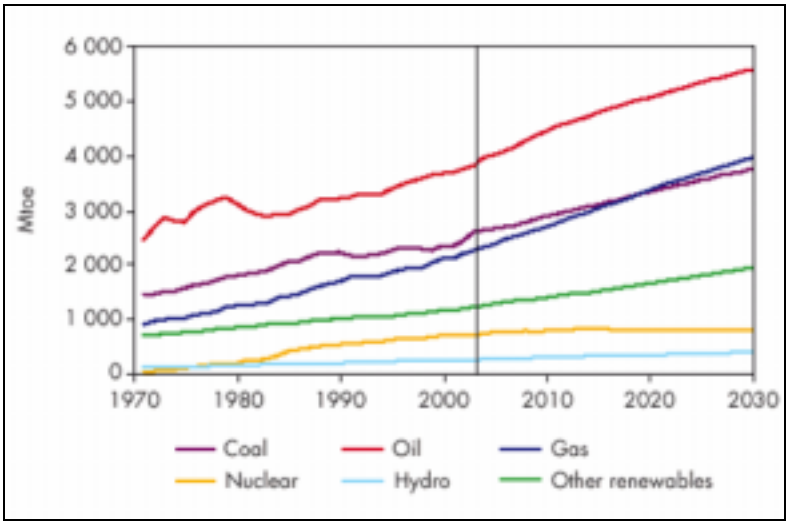
Content

The volatility of the oil price creates false impressions about international energy supply in two regards: firstly, that there is a functioning competitive world market that balances demand and supply through a flexible oil price; secondly, that not only oil price is unreliable but also demand and supply in dependence on the oil price. Neither perception is grounded in reality. Although we have functioning and competitive spot markets in different parts of the world, the world oil market lacks major elements of a competitive market, and while the oil price is indeed volatile, there are very robust trends on demand and supply, which give a good basis for projections two or more decades into the future.

Chart 1: World Primary Energy Demand by Fuel in the Reference Scenario



Source: World Energy Outlook 2005, p. 81.

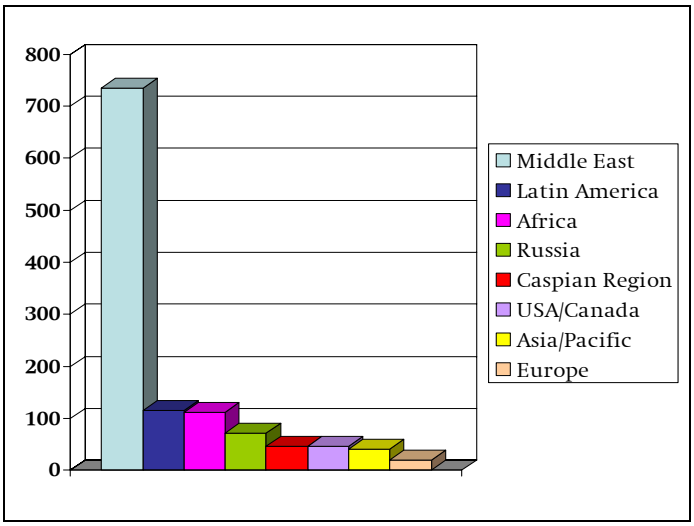
One stable trend is shown with Chart 1: Between 1970 and 2005 we experienced a rather constant growth in all major energy sources. The share of the energy sources did not change significantly. Oil kept its position as the number one energy source, coal and natural gas as numbers two and three, followed by renewables. This is remarkable insofar as the dramatic oil price rise between 1998 and 2003 is not reflected in any decrease in the growth of demand, while contrary to market rules, the decrease in demand during the early 1980s took place in parallel to a decline in price. It could, however, be that the decline in demand trails price increases with a delay of several years as it might explain the price decline of the early 1980s following the price rises between 1973 and 1980. In our current situation this could mean that a decline in demand analogous to the decline in the early 1980s could begin in 2006/2007. But even if this hypothesis holds true, it is probable that after a brief adjustment period oil demand will return to its growth path as it did during the 1980s.

The main hypothesis of this paper, however, is that we are witnessing three robust trends in the oil sector. If we do not take fundamental political measures to change them we will run into a severe conflict situation. With regard to natural gas we have more options but do not make sufficient use of these options due to the costs of infrastructure and difficulties associated with reaching a consensus on preferences concerning this issue.

Trends on the global oil market

The first trend is towards an extreme concentration of oil reserves in the Middle East (Chart 2), a trend that we should expect to accelerate in the future. The Middle East is exploiting its reserves more slowly than all other regions. An indicator of this fact is the higher ratio of reserves to yearly production (R/P ratio) in the Middle East as compared to other regions.

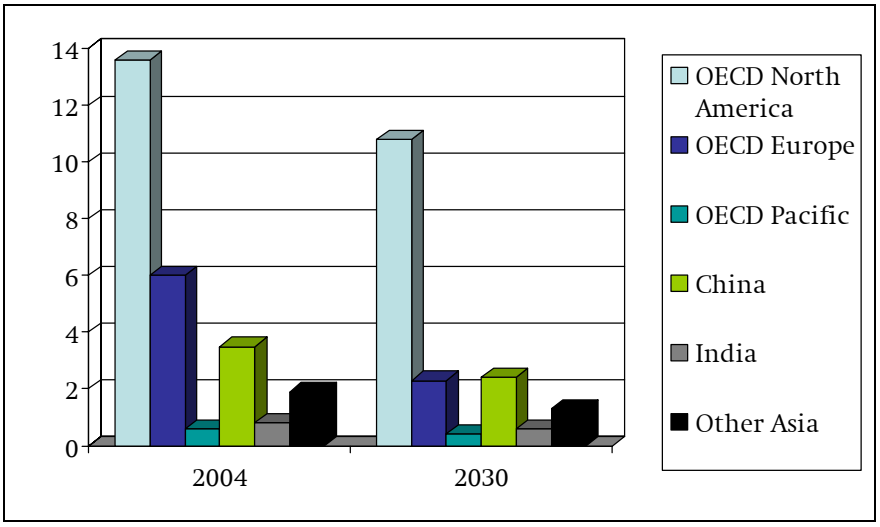
Chart 2: Concentration of Oil Reserves (2004)
billion barrels



Source: BP Statistical Review of World Energy, June 2005.

The second trend lies in the absolute decline in oil production in major energy consumer regions during the decades to come (Chart 3). This development applies not only to OECD regions but also to the big Asian markets.

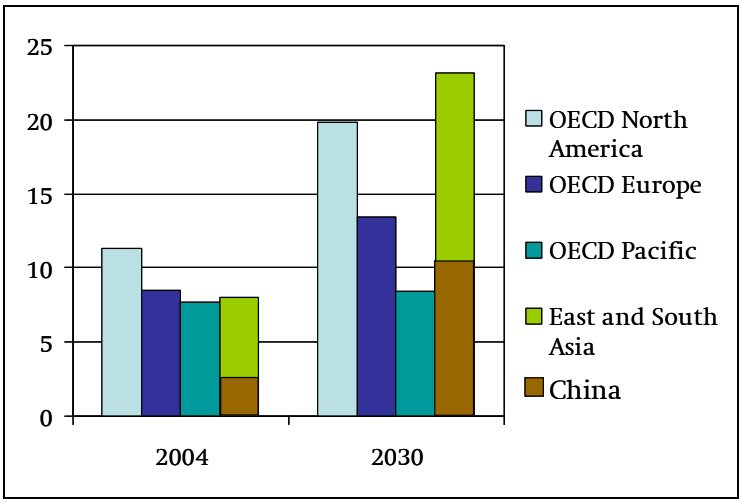
Chart 3: Oil Production in Demand Regions
million barrels per day



Source: IEA, World Energy Outlook 2005, p.90.

The third trend concerns the East and South Asian markets (excluding the OECD countries Japan and South Korea), which will massively increase their imports of oil. These markets will surpass all of the three OECD regions in demand (Chart 4). This tendency has already become noticeable and will further change the rules of the game, which until recently were determined on the demand side by OECD rules. These rules include solidarity measures in the case of a crisis as determined by the International Energy Agency (IEA).

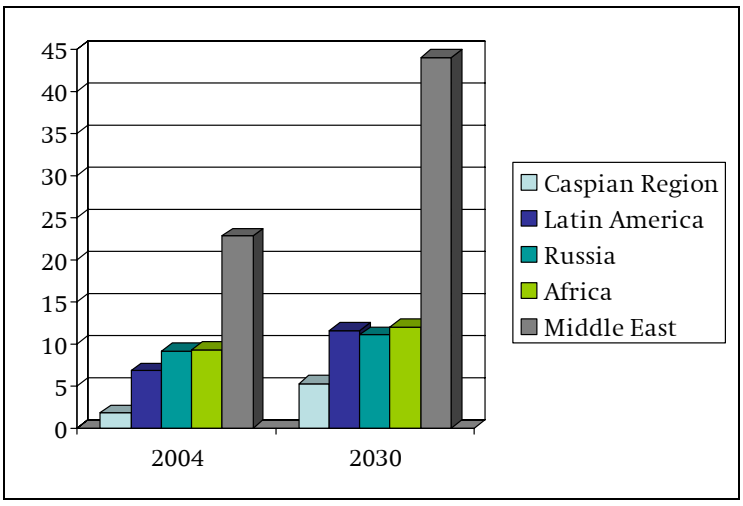
Chart 4: Net Imports of Major Demand Regions
million barrels per day



Source: IEA, World Energy Outlook 2005, p.83, 90.

It follows from these three trends that all regions besides the Middle East will have to produce to their maximum potential, while the Middle East will still have to shoulder the major burden of closing the gap between growing demand and supply (Chart 5). The Middle East, however, does not seem to be ready to accept this burden which implies a doubling of production based on 2004 figures.

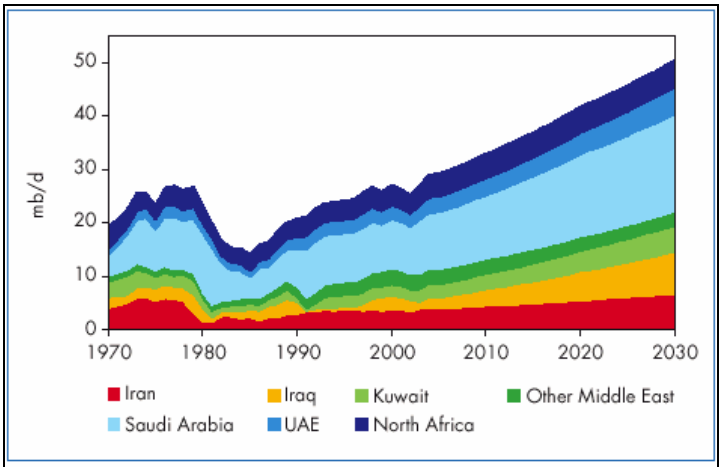
Chart 5: Oil Production in Supply Regions
million barrels per day



Source: IEA, World Energy Outlook 2005, p. 90, 297, 449.
BP, Statistical Review of World Energy, June 2005, p. 6.

Saudi Arabia, for instance, does not consider such an increase in its investment policy. Iraq will probably not be able to quadruple its production as the IEA suggests. Iran is extremely unreliable when it comes to following the IEA projection path (Chart 6).

Chart 6: MENA Crude Oil Production by Country in the Reference Scenario



Notes: Includes NGLs and condensates.
Other Middle East includes Qatar in addition to Bahrain, Israel, Jordan, Lebanon, Oman, Syria and Yemen.

Source: World Energy Outlook 2005, p. 138

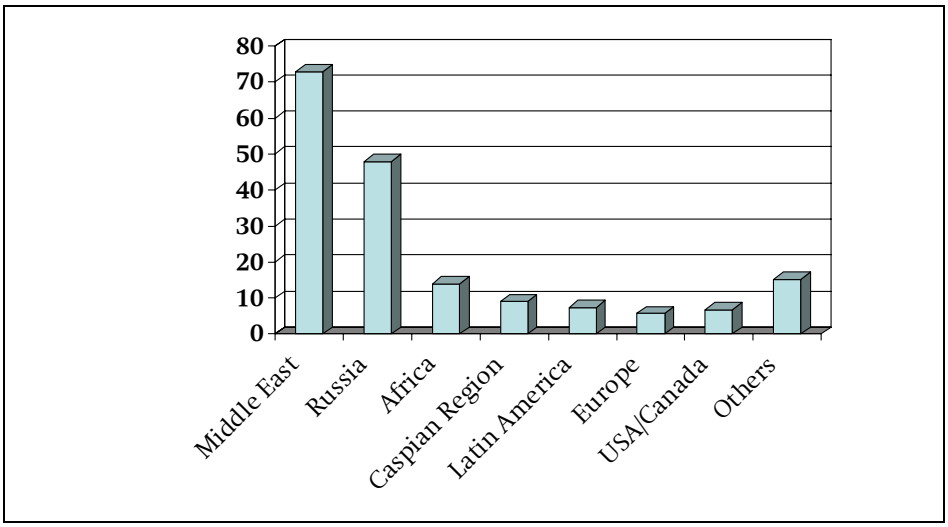
The four big potential and/or current oil producers, Saudi Arabia, Russia, Iran, and Iraq, which together hold fifty percent of world conventional oil reserves, are all reluctant to accept the foreign direct investment that would be necessary to develop oil production in such a way as would be required by market rules. Saudi Arabia does not allow entry to any foreign investor in oil exploration and exploitation, while Russia accepts foreign investment to a much lower degree than what makes sense to cover demand. Iran has established extreme administrative obstacles to foreign investors, and Iraq deters foreign investors with its extremely bad security situation. If these countries do not invest, the supply-demand gap will widen.

If market forces cannot work, political forces will take over. China's activities to get access to oilfields in Africa (Sudan, Nigeria, and others), the Caspian area, and the Middle East gives reason for concern in the OECD world. The perception there is that the politicization of the oil business through China makes solutions in conflict regions such as Sudan and possibly also Iran more difficult. As a result a consumer-consumer dialogue, more specifically between OECD countries and Asian countries, has to be put on the agenda in order to develop common rules and also to give secure access to the global oil market to all potential consumers.

The natural gas situation – critical deficiencies in infrastructure

The natural gas supply situation is quite different from the oil problem. On the one hand, the concentration of natural gas reserves in the Middle East is less pronounced globally than is the case for oil reserves (Chart 7). In addition to the Middle East, Russia is a major player here. Russia is the country with the largest single national natural gas reserves, the largest producer, and by far the largest exporter of natural gas. Africa and the Caspian region also dispose of significant reserves.

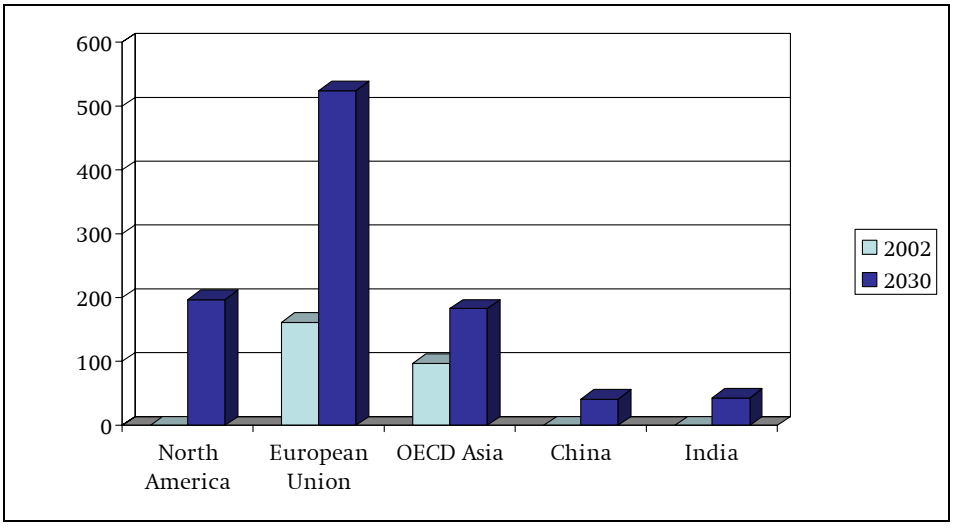
Chart 7: Concentration of Natural Gas Reserves
2004 in trillion cu m



Source: BP Statistical Review of World Energy, June 2005.

A second reason that the natural gas supply situation is unlike the oil problem lies on the demand side. While oil is needed in all countries at least for the transportation sector, natural gas use is generally limited to countries with a pipeline network that reaches each individual consumer. It is also this need for infrastructure which limits the international trade structure to only a few producers and consumers. Europe is the by far largest importer of natural gas worldwide and, according to IEA projections, this situation will remain unchanged during the decades to come (Chart 8).

Chart 8: Natural Gas Imports of Major Regions
billion cu m

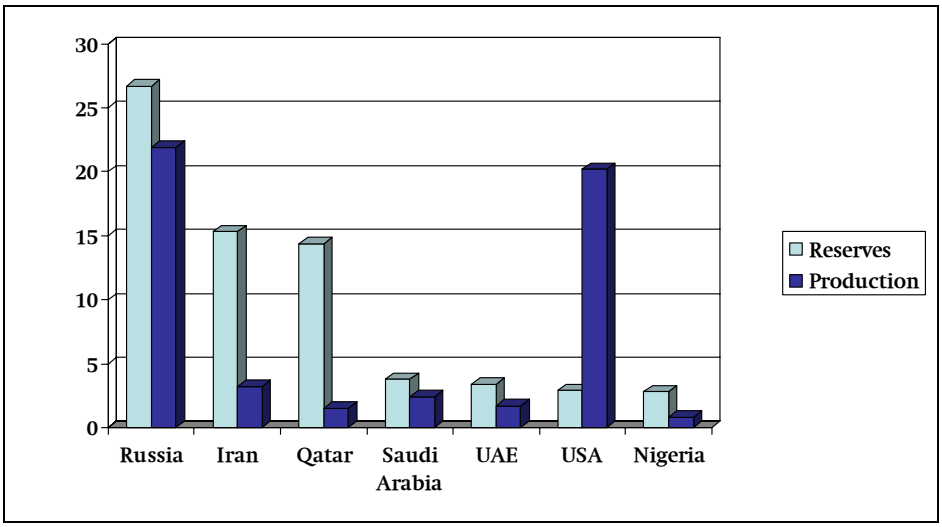


Source: IEA, World Energy Outlook, 2004, p. 140.

China and India are now on the way to becoming natural gas importers. In comparison with oil, it will take much more time before these large Asian markets become big players on the global natural gas market.

Nevertheless the strategic question is who cover the dramatic increase in world demand (a near quadrupling of the global import demand by 2030, according to IEA projections). Russia will supply only a small share of the increase.

Graph 9:Share of Reserves and Production in Major Natural Gas Reserve Countries 2004 percent



Source: BP Statistical Review of World Energy, June 2005.

Graph 9 lists the seven largest natural gas reserve countries. The light columns show the share of world reserves of each country, the dark columns the share of world production of the same countries. The United States, for instance, has a production share that far exceeds its reserve share. This means that this country will exploit its reserves comparatively quickly. Russia's production share is almost the same as its reserve share. The two countries which still have a tremendous potential for increasing their production are Iran and Qatar. The demand growth requires the making use of the production potential of these two countries. Their geographic location unintentionally provides the choice between LNG or pipeline transportation to Europe, South Asia, and even China. Qatar appears to have decided in favor of LNG, Iran in favor of pipelines. It is quite clear though that Iran will also will use LNG transportation for a smaller share of its exports. It is also possible that Qatar will join a big pipeline project that will link the region with the huge European market. For the time being these projects, however, are far from being a sure thing. Furthermore, the number of options is limited to providing the supply to the growing demand in either Europe or South and East Asia. It seems obvious that the Middle East will become an area for competition between different consumer regions. Insofar, more pressure will be exerted on this unstable region.

Conclusions

The three trends on the oil market discussed above, a growing concentration of reserves in the Middle East, a decline of oil production in all consumer regions, and a dramatic increase of demand in China and other Asian countries, will make the oil market extremely tight in the foreseeable future, even more so because the big potential oil supplier countries are reluctant to mobilize the investment necessary in order to meet growing demand. In addition the international gas market will turn to the Middle East, where major production growth is to be expected. Combined, these factors may well produce an escalation of tensions and weakening of conflict resolution instruments unless a dialogue between the large consumer countries as well as between the

consumer and producer sides takes place in order to establish rules that guarantee a fair competition and a clear separation between economic and political goals.

Besides the establishment of such rules, cooperation between principal countries in research and development should be institutionalized in order to find economically sound alternatives to oil consumption, most of all in the transportation sector. This sector has the highest energy consumption growth worldwide. Current cooperation on fusion technology, which might lead to new sources of energy in the second half of the 21st century, could be a model. China, Japan, South Korea, Russia, the European Union, and the United States have played leading roles in this common endeavor to harness the power that fuels the Sun. There is not reason to believe that these countries should not also be able to find a way to develop alternative fuels for automobiles and, in the long run, airplanes. Such an effort could help reduce the likelihood of future distributional conflicts while also potentially solving the climate change problem. As a rising world power, China has a particular responsibility to take the lead in stimulating such cooperation and thus ensuring a more peaceful future for the world.