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Global Security in the 21st Century
Perspectives from China and Europe

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**Energy Supply Security: Demands on Politics as Consequence of Changed Market
Constellations**

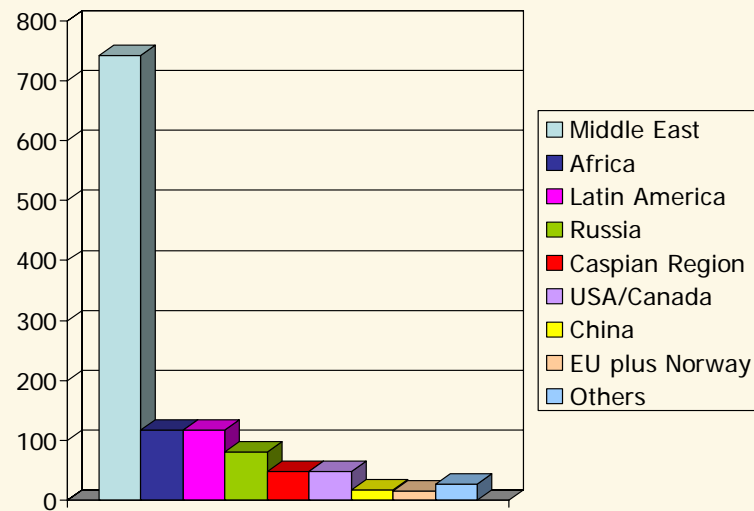
Friedemann Müller, SWP

Energy security for good reasons became a top issue in international politics. The buyers market of the 1980s and 1990s for oil, the most important energy carrier, changed into a sellers market. The question often asked is, whether this will remain so or whether the market will shift the power around again as it did after the oil crises of the 1970s. The answer is the market will not have the power to change the oil and natural gas market back into a market where the buyers can determine the rules. The reason for this lies in the following robust trends and the restricting factors that will stay on for the coming decades.

1. Trends and restricting factors on the oil market

First Trend: *The oil reserve concentration in the Middle East*. As chart 1 spells out we have to realize an extreme concentration of the remaining oil reserves in the Middle East, more than 60 percent of all global oil reserves are located here.

Regional Concentration of Oil reserves (2006) billion barrel

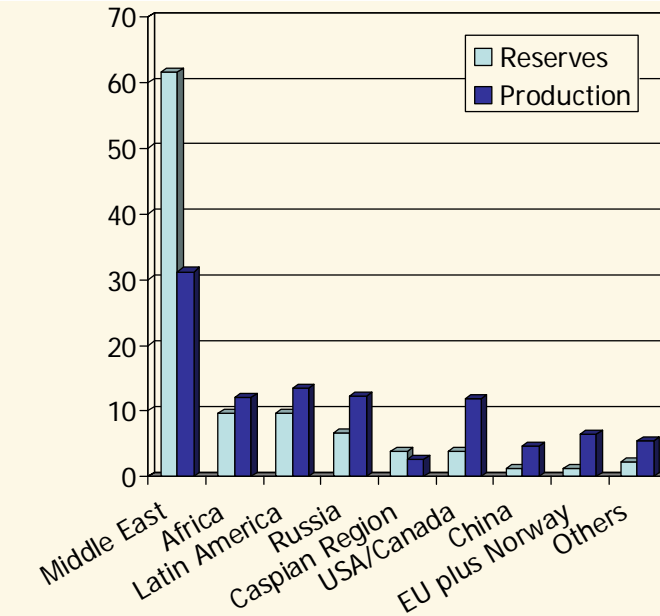


Source: BP Statistical Review of World Energy, June 2007.

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This concentration will become even stronger. Chart 2 compares the shares of reserves of each region (light blue) with the share of production of the same region (dark blue). All regions besides the Middle East and the Caspian region have a higher share of its production in world production than the share of reserves in world reserves.

Regional Shares in World Oil Reserves and Production (2006) million barrels per day



Source: BP Statistical Review of World Energy, June 2007.

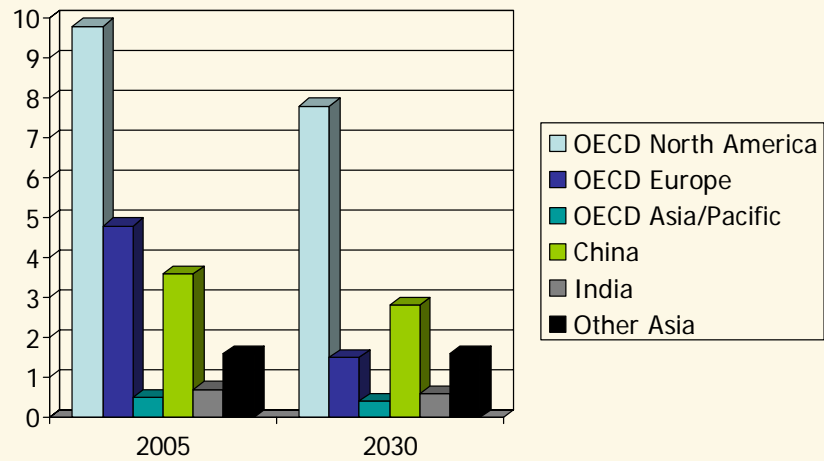
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The inevitable conclusion from this comparison means that the other regions besides the Middle East and Caspian are exploiting their reserves much quicker so that the remaining reserves of the Middle East and Caspian region will get a further growing share in world reserves. Another conclusion is that the market becomes increasingly monopolized on the supplier side and this transforms the economic potential of the resource availability into political power. We have seen already the political instrumentalization of resource availability in Venezuela as well as in Russia and in future we will see more of it.

It is quite clear that the Caspian region plays a minor role for the supply of the world market in comparison to the Middle East but the very fact that the Caspian region can expect a considerable growth in its production is quite meaningful for the future oil market. It can also mean that the region might become a battle field for oil and natural gas distribution.

Second trend: *The decline of production in demand regions.* The big oil consumer regions, the Western industrialized (OECD) regions as well as the newly emerging economies such as China and India will have to calculate with an absolute reduction of their respective oil production (chart 3). This means that even if the consumption of oil will stay stable the import share and the import dependence has to grow.

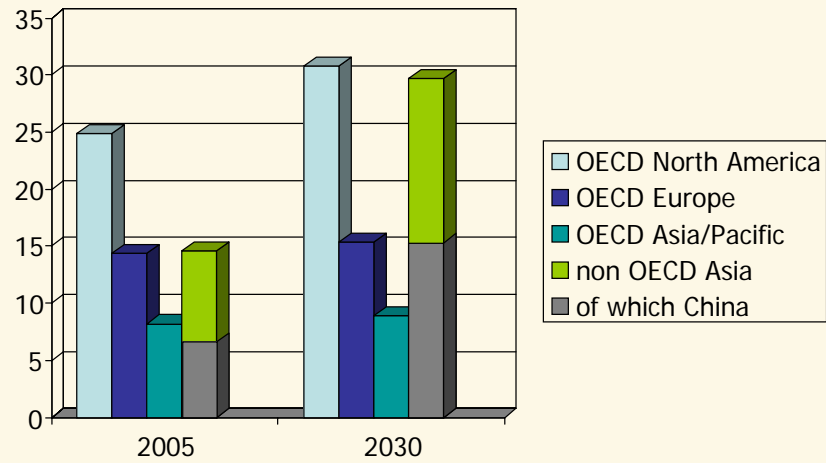
Oil Production in Demand Regions 2005-2030 million barrels per day



Source: IEA, World Energy Outlook 2006, p. 92.

Third trend: *The demand growth in Asia.* The demand, however, will grow (chart 4), particularly in the Asian emerging markets.

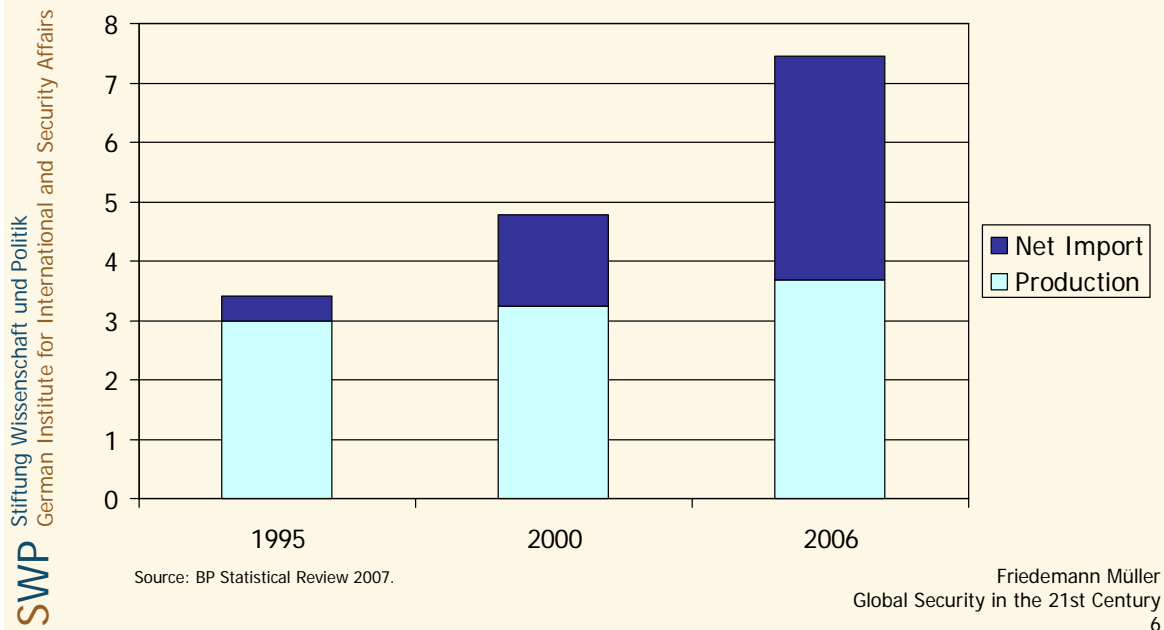
Oil Demand in OECD regions and Asia 2005-2030 million barrels per day



Source: IEA, World Energy Outlook 2006, p. 92.

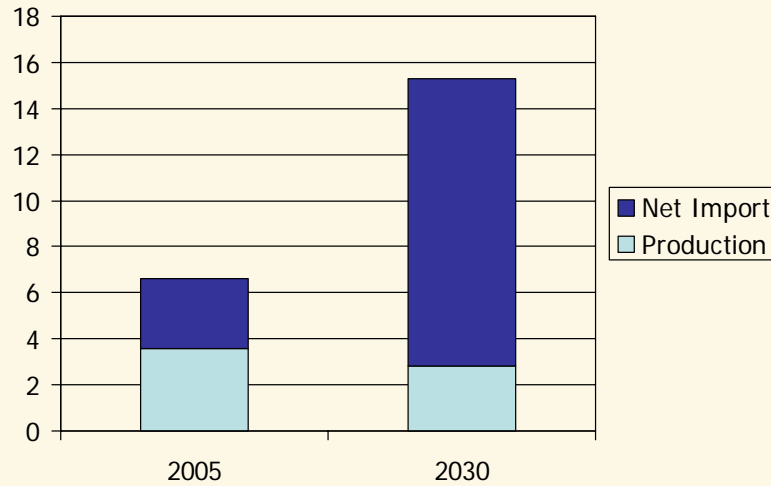
The case of China indicates what this means for the international oil market (chart 5). While in 1993 China still was a net exporter it is now the second largest consumer and third largest importer and thus has a major influence on the demand side of the internationally traded oil.

China's Oil Production, Consumption and Net Imports (1995-2006) million barrels per day



The projection of the International Energy Agency (IEA) until 2030 shows a further continuing rise of China's oil imports (chart 6) which will be a strong burden for the distribution of the international oil supply.

China's Oil Production, Consumption and Imports 2005-2030 million barrels per day

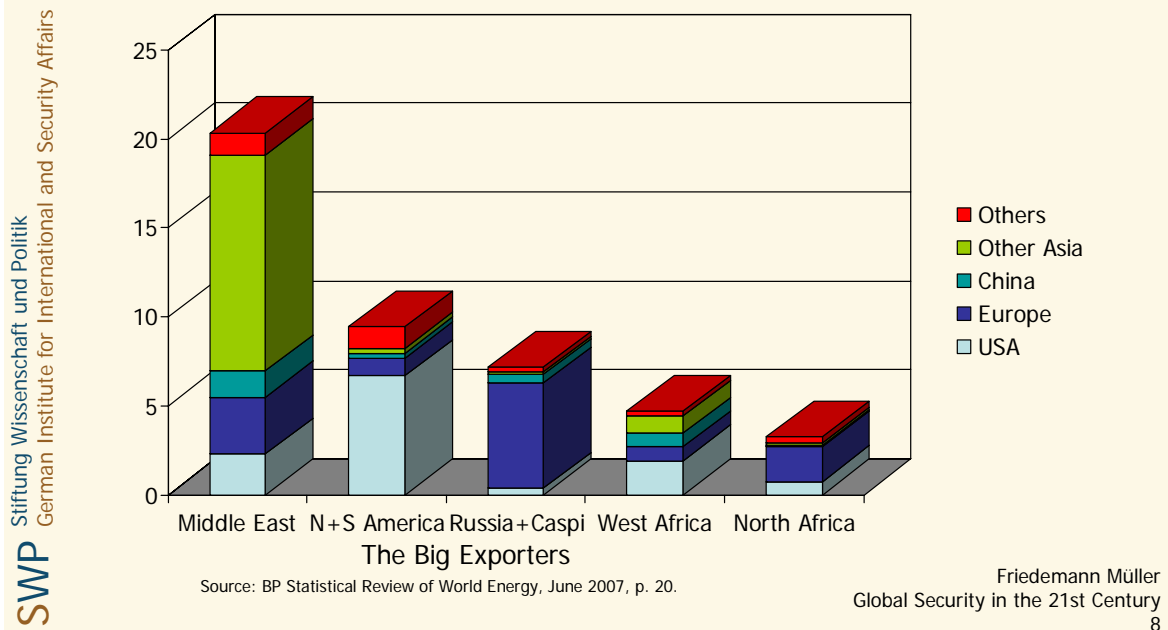


Source: IEA, World Energy Outlook 2006, p. 86, 92

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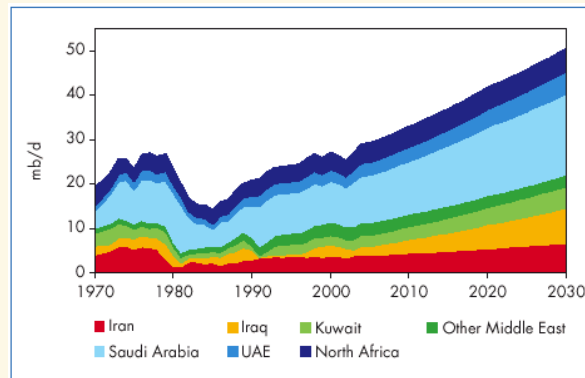
Besides the three trends we have two factors which restrict the flexibility of the market. One is the inflexibility of the oil trade. The structure has been relatively fixed over many years.

Inter area oil trade 2006 million barrels per day



As chart 7 shows most of the oil exported in the Western hemisphere goes to the U.S. market. Most of Russian, Caspian and North African oil goes to Europe. Most of the Middle East oil goes to Asia. The problem is that this fixed structure does not reflect the future demand-supply relation. This embraces a major conflict potential. All major oil consumer markets will try to get more oil from the Middle East but this region probably will not provide the required supply.

MENA Crude Oil Production by Country in the Reference Scenario



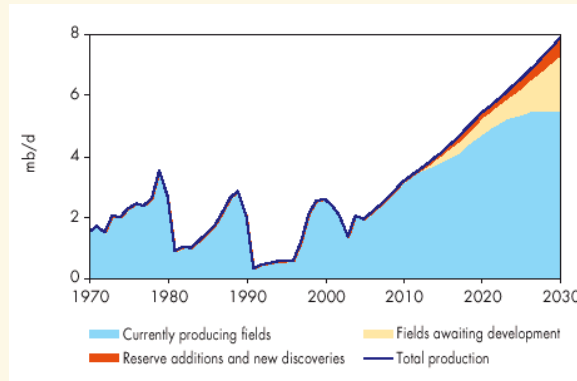
Notes: Includes NGLs and condensates.
Other Middle East includes Qatar in addition to Bahrain, Israel, Jordan, Lebanon, Oman, Syria and Yemen.

Source: World Energy Outlook 2005, p. 138.

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Chart 8 shows how the Middle East and North Africa (mainly Algeria and Libya) should increase its energy production so that the future demand can be met. Looking at the production development of the past 30 years it looks improbable that the development will be as indicated in the graph. This might become even clearer if we look at the required oil production of Iraq only (chart 9).

Iraq's Oil Production by Source in the Reference Scenario



Source: World Energy Outlook 2005, p. 395.

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One has to be an extreme optimist in order to believe that the oil production will follow this projection.

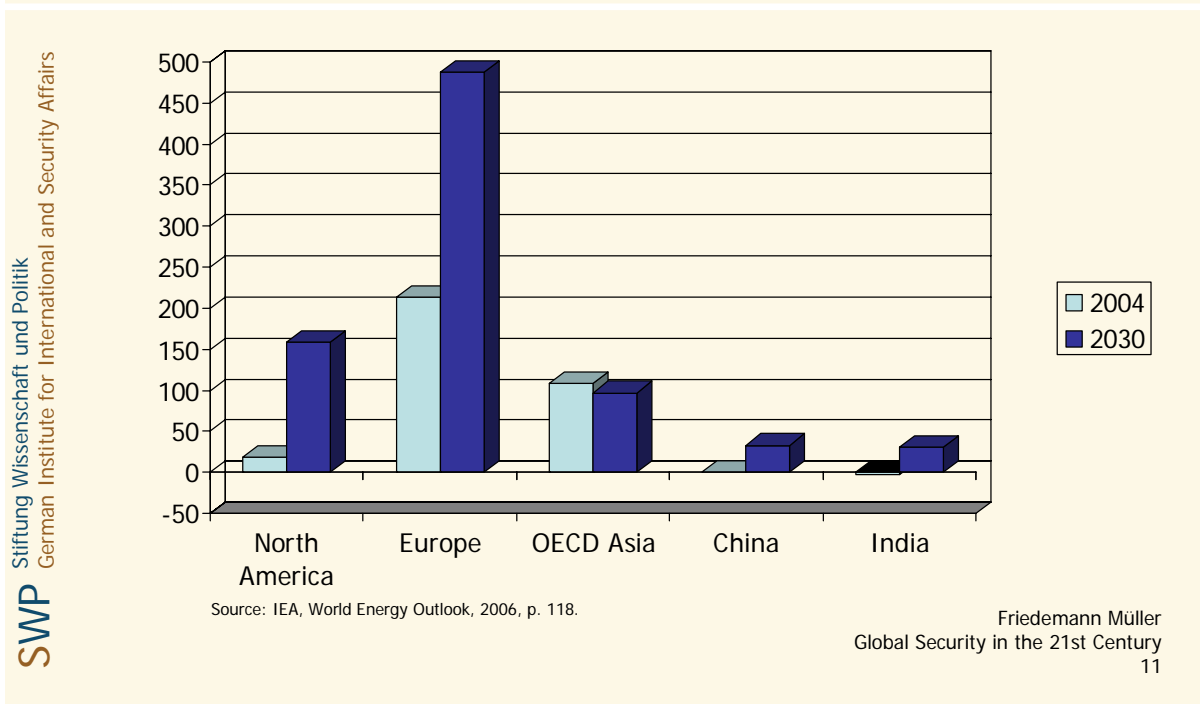
The second restriction comes from the fact that different from the 1970s when about 80 percent of oil production was in the hands of private business following the company's economic interests, today about 85 percent of the production is run by state companies. They adjust to the rules of monopoly behaviour and they have a political agenda. The presidents of Venezuela, Iran or Russia, three of the largest oil export countries, do not hide this political agenda. Saudi Arabia the largest oil producer and exporter follows a clear cut monopoly constellation.

The dependency of the consumer countries thus is a twofold, an economic due to the price manipulations of the suppliers and a political one due to the ability of suppliers to realize their political agenda. Europe feels this very much in its negotiations with Russia on different issues such as the Russian access to the membership of the World Trade Organization (WTO).

2. The Natural Gas Market

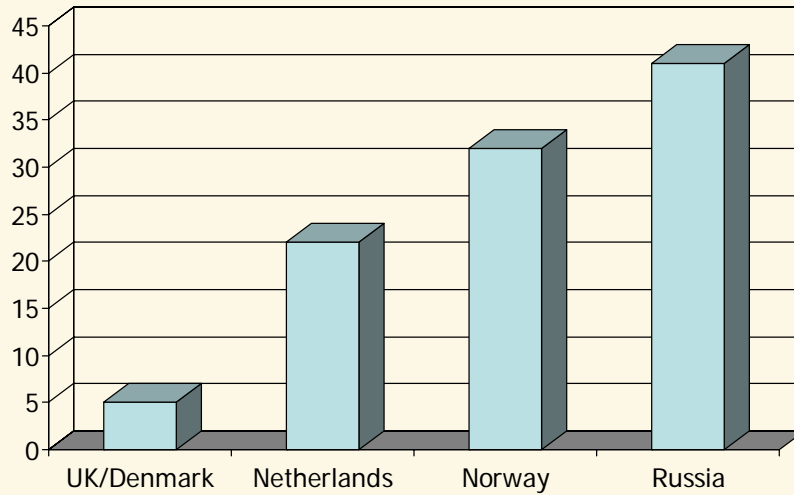
The structure of the natural gas market and its conflict potential differs substantially from those of the oil market. Natural gas is - due to the higher transport costs – internationally traded only over shorter distances than oil and mostly by pipeline. The effect is that up to now we have three almost strictly separate markets, a North American market, a European-Russian- North African market and a Pacific market including Australia and East Asia. The increasing share of Liquefied Natural Gas (LNG) transportation will gradually remove the borders separating these three markets. What will stay for two to three decades is the dominant role of Europe as the largest importer and a comparably small role of the Asian consumer markets (chart 10).

Natural Gas Imports of Demand Regions 2004-2030 billion cubic meters



The largest import market within Europe is Germany. Its imports are diversified as shown in chart 11.

Distribution of Germany's Natural Gas Imports 2005

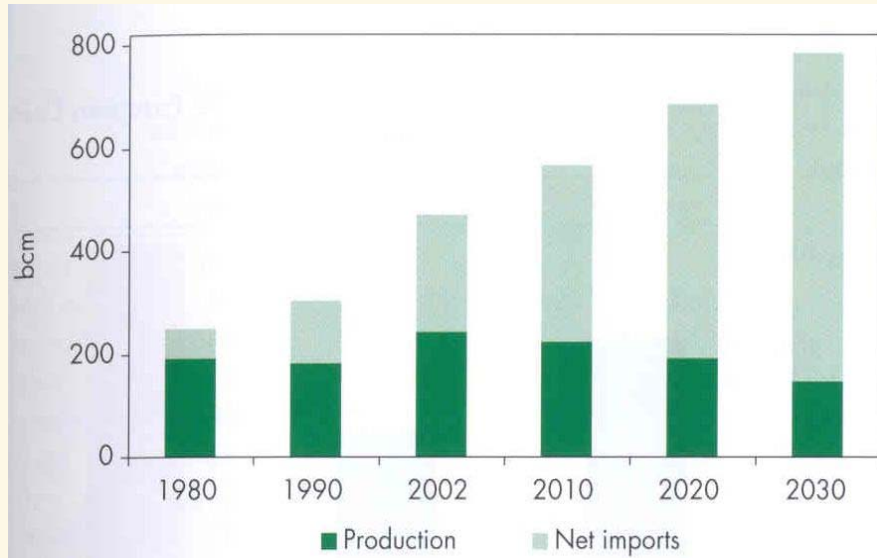


Source: DIW Berlin, Wochenbericht 8/2007 p. 113

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The problem with the European suppliers, however, is that this growing consumer market will have a decline of domestic production which means that the share of imports from outside Europe has to grow rapidly (chart 12).

Natural Gas Supply in Europe 1980-2030

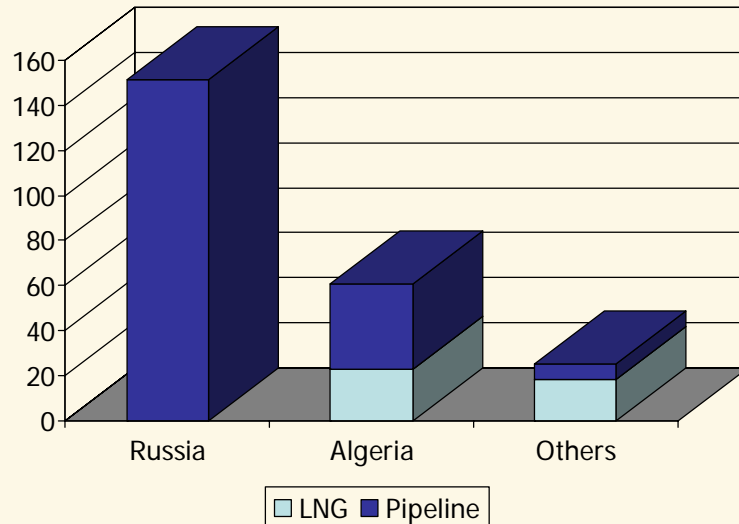


Source: IEA, World Energy Outlook, 2004, p. 155.

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Looking at Europe as a common market it has an extremely bad diversification of its imports (chart 13)

Europe's Natural Gas Imports 2005 billion cubic meters



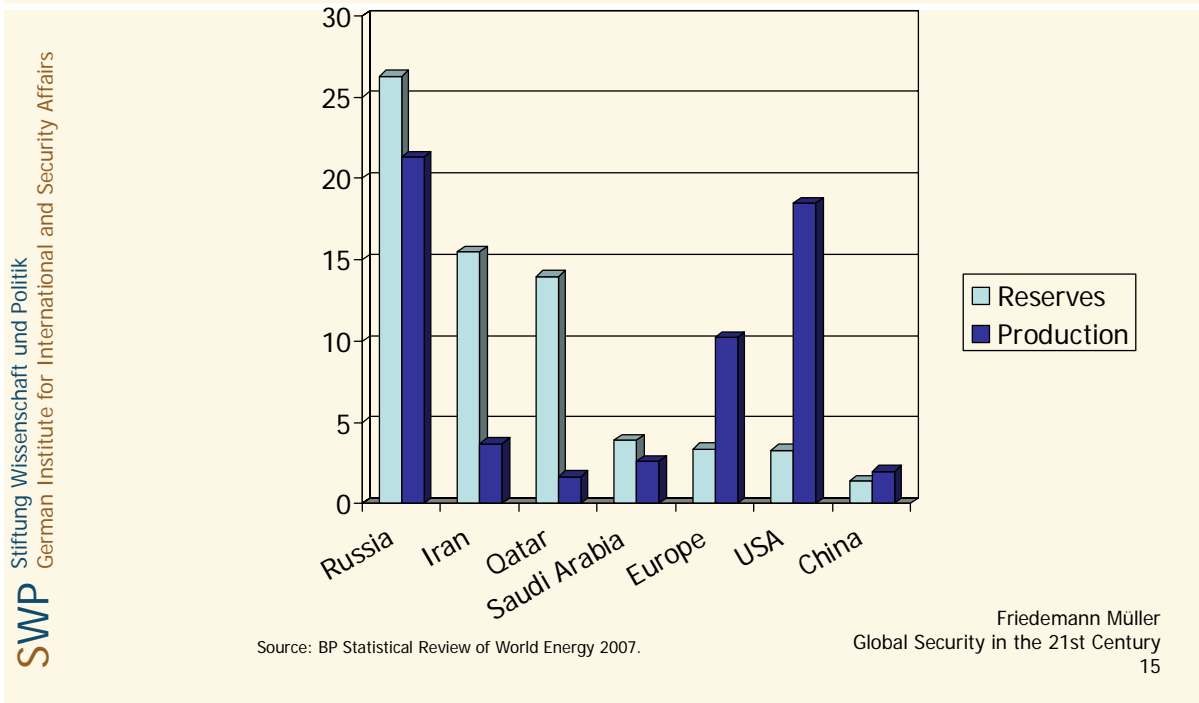
Source: BP Statistical Review of World Energy, June 2006, p. 30.

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Russia plays a dominant role in supplying the European market. Considering the dramatic increase of import demand in Europe Russia alone will not be in the position to keep its market share on the big European market. Therefore, Russia tries to keep its dominant position by buying Caspian natural gas and trying to establish a natural gas equivalent to OPEC on the oil market.

What are the alternatives for Europe for diversification and satisfying its demand? Chart 14 compares the share of world natural gas reserves with the share in world production in different regions.

Shares of Regions in World Natural Gas Reserves and Production 2006



It is obvious that the big consumer markets North America and Europe will eat up its reserves quickly while there are exactly two countries that can increase their production substantially: Iran and Qatar with together a roughly 30 percent share in world natural gas reserves. The fact that these two countries have a huge production growth potential and their geographic location allows a supply by pipeline and LNG not only of Europe but also of South and East Asia makes these countries to objects of a potential distribution conflict. It puts, for instance, Iran into a powerful position with regard to its nuclear program and the international objections against it. It might play with its export diversification according to the importers' political adjustment to the Iranian position with regard to this conflict.

3. Options for Conflict Prevention

The analysis so far should have made clear that the international energy distribution has produced a serious political dimension and conflict potential. The market is no competitive market any more but monopolized under control of the major supplier countries. Due to the tremendous demand rise in emerging economies and the hesitant supply rise in those few countries that still can increase their oil and natural gas production this control of the supplier

countries will remain for decades to come. We, the consumer side, have to cope with it. We have mainly four options to reduce the tensions on this market

- *A consumer-consumer dialogue:* Until a few years ago the oil market was dominated on the demand side by OECD countries. They followed OECD rules that are more or less identical with WTO rules. This has changed. The new importers, particularly China, have introduced their own rules in the market. Different from OECD importers China is acting on the international market with state owned energy companies. In their bidding behaviour they follow not just rules of profitability but also of state interests such as security of supply and they can count on government support for instance to protect the oil exploitation in Sudan. They also can be a part of a state strategy to link the political interest of development in the region and good political and economic relations between China and the respective country. All this makes the behaviour of Chinese companies for multinational oil companies less calculable and leads to frustration on the companies side.

It is quite understandable and has to be recognized that China with its huge demand growth needs to open the traditional market structures to its own favour. On the other hand nobody is served to the better if, for instance, the mix of economic and political interests leads to a stabilization of a corrupt leadership as in Sudan. Therefore, we need a dialogue between the traditional (Western) demand side and the new Asian emerging economies in order to establish rules that serve both sides and prevents the fuelling of conflicts.

- *A consumer – producer dialogue:* The international oil market is full of uncertainties, not just because of the monopolization and politization of this market but also due to the different rules according to which both the demand and supply side organize the procurement supply policy and the influence of the climate policy on the energy mix in industrialized countries. A consumer – producer dialogue could be helpful to bring more transparency into this market. This dialogue should not only introduce rules to depoliticize the market but offer also security of demand options for the producers with regard to the post-oil age. It is obvious that the oil production peak that happened in North America and Europe already years ago and will also occur in China and Russia in a few years will take place on the global level within the next 25 years. The producer and consumer side has to prepare for that being aware that the time of oil available as the most important energy carrier is limited. If the main oil producers could be convinced to invest a significant share of their revenues into solar energy

they might become again the market leader in this new age. The whole question of managing the energy change in the 21st century should be put on the agenda of this dialogue. We need to bind the producers, particularly the OPEC as one of the wealthiest and stable international organizations, into a structure of global responsibility and we should do it in a way that is to the favour of the producers.

- *Improving the supply infrastructure for natural gas transportation:* Many in Europe blame Russia for exploiting its monopoly position of a natural gas supplier as a political weapon. Not so many ask why Russia could receive this position. It very much has to do with the lack of infrastructure that would enable Europe to buy natural gas elsewhere. Natural gas plays an increasing role in the energy mix of Europe but also worldwide. Therefore, it is indispensable to provide a transport infrastructure which allows a competitive market structure. It is obvious that in the future the Persian Gulf region, particularly the two countries Iran and Qatar will increase their share in world supply. We should support a transportation infrastructure which allows all interested consumer countries to get access to this emerging export region without insisting in exclusive contracts. Natural gas can, to some degree, be a substitute to oil in a transition period when a conflict over the oil distribution might become serious.
- *Managing the decarbonization of the energy supply:* The most important approach to prevent conflicts generated by deficiencies in oil and natural gas distribution, however, is a long-term exit strategy from fossil energy, particularly oil. We have to improve the energy efficiency continuously in all countries and at the same time we have to move from fossil to non-fossil energy. Otherwise we will have rising conflict constellations in Africa, the Middle East and Latin America. The economic and political costs will be much higher if we continue to give oil a share of more than 35 percent in the global energy mix than if we make use of the options to switch continuously to non-fossil energy carriers and to make use of the potential for improving the energy efficiency. This requires particularly new technologies in the transportation sector where most of the oil goes to.

The internalization of the social costs of further wasting fossil energy is the challenge for national and international policies. What we certainly need is a cooperative not a confrontative approach to solve this major global problem of the 21st century and China is a key player in this game.

Table 1 (Chart 2)

**Regional Concentration of Oil Reserves
2006**

	Quantities billion barrel	Share of World Reserves percent
Middle East	742.7	61.5
Africa	117.2	9.7
Latin America	116.4	9.7
Russia	79.5	6.6
Caspian Region	47.3	3.9
USA/Canada	47.0	3.9
China	16.3	1.3
EU plus Norway	15.6	1.3
Others	26.2	2.2
Total	1208.2	100
Oil Sands	163.5	+13.5

Source: BP Statistical Review of World Energy, June 2007.

Table 2 (Chart 3)

**Regional Shares in World Oil Production
2006 million barrels per day**

	quantities	share in world production

		(percent)
Middle East	25.59	31.2
Africa	9.99	12.1
Latin America	10.56	13.5
Russia	9.77	12.3
Caspian Region	2.24	2.7
USA/Canada	10.12	11.9
China	3.68	4.7
EU plus Norway	5.19	6.4
Others	4.52	5.5
Total	81.66	100

Source: BP Statistical Review of World Energy, June 2007.

Table 3 (Chart 8)

Inter-area Oil Trade 2006
million barrels per day

From \ To	USA	Europe	China	Other Asia	Others
Middle East	2.28	3.21	1.49	12.12	1.24
N+S America	6.71	0.99	0.27	0.27	1.19
Russia + Caspi	0.37	5.89	0.49	0.15	0.26
West Africa	1.92	0.80	0.74	0.95	0.30
North Africa	0.74	1.95	0.08	0.12	0.35

Source: BP Statistical Review of World Energy, June 2007, p.20.

Table 4 (Chart 15)

Shares of Regions in World Natural Gas
Reserves and Production 2006

	Reserves trillion cubic meters	Share percent	Production billion cubic meter	Share percent
Russia	47.65	26.3	612	21.3
Iran	28.13	15.5	105	3.7
Qatar	25.36	14.0	50	1.7
Saudi Arabia	7.07	3.9	74	2.6
Europe	6.25	3.4	294	10.2
USA	5.93	3.3	524	18.5
China	2.45	1.4	59	2.0
World	181.46	100	2865	100

Source: BP Statistical Review of World Energy, June 2007