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ENERGY SECURITY: OIL SHORTAGES AND THEIR IMPLICATIONS

High petrol prices and increasing instability in the Middle East have moved the topic of energy security into the center of international debates. It is widely believed that the scarcity and high cost of energy can create recession and global tensions. It is true that the industrial societies of the West must adapt in the long term to the post-oil period. Until then, however, both consumer states and producers have an interest in maintaining the stability of the global market; a "war for resources" between the oil-hungry superpowers is unlikely.

An oil refinery in Malaysia *Photos.com*

The debate about the looming energy crisis refers primarily to oil, which currently makes up 40 per cent of global energy consumption and is thus by far the most important primary source of energy. It is therefore unsurprising that not only markets and stock exchanges, but also politicians and the general public react sensitively to increasing tensions in the resource-rich Middle East. According to the results of a BBC World Service survey in 19 countries, published in June 2006, 77 per cent of respondents fear that energy shortages and rising prices will destabilize the global economy. Notably, 72 per cent believe that competition for resources will give rise to more conflicts.

This perception is characteristic of the Western countries that depend on oil imports, including the US, Japan, and most of the European states. Uncertainty is also rife in Switzerland, where petroleum products account for 56.5 per cent of all energy sources: According to the results of the Univox survey published in September 2006, 69 per cent of the Swiss population believe it is likely that their country will be threatened by shortages of raw materials and energy in the next five years. This is an increase of 41 per cent compared to 2004.

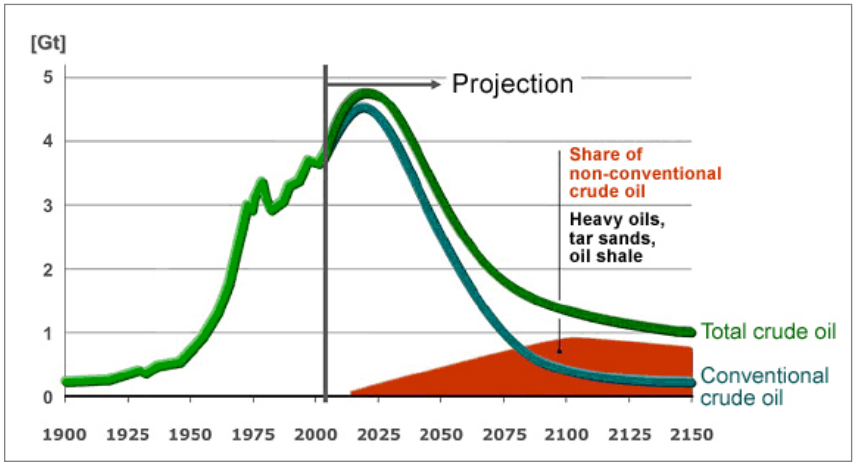
Instability in the Middle East

Developments in the Middle East, which holds approximately two-thirds of the world's oil and gas reserves, are a key factor contributing to fears about supply shortfalls. In addition to the ongoing conflicts, some observers are concerned that terrorist attacks on key energy infrastructure and the ascent of conservative religious groups to power will keep the region in turmoil for the foreseeable future.

In the past, crises in this part of the world have caused sharp short-term increases in the price of oil. However, at the same time, the petroleum industry has generally proven to be resilient to political upheavals: Even after the 1979 revolution and its hardline anti-Western rhetoric, Iran remained a reliable supplier of energy to the West. The Soviet Union supplied energy to Western Europe even during the most frosty phases of the Cold War, and Russia has continued to do so after the demise of Communism. Venezuela, despite its radical about-face from its previous US-centered foreign policy, remains one of the US's key energy partners.

Unlike in the 1970s, when massive price hikes triggered recessions in many Western industrial countries, the high oil prices today have hardly affected economic growth in the West so far. The US economy has experienced annual growth rates of between two and four per cent over the past years –– and even increased by 5.3 per cent in the first quarter of 2006. In the Eurozone, the EU Commission expects an economic growth rate of 2.1 per cent, which is 0.2 per cent above the rate anticipated in autumn of 2005. The high price of oil has not had any noticeable effects on the economic situation in Switzerland, either. As far as the risk of terrorist attacks is concerned, simple threats are already sufficient to destabilize the global markets. While

attacks on extraction sites and transport routes can cause short-term disruptions to the trade, damage to or destruction of refineries would cause significantly more harm. A terrorist attack on a large refinery in Saudi Arabia was prevented in February 2006. However, the mere report was enough to send oil prices skyrocketing, at least in the short term. It should be noted that destroying a refinery is a complex undertaking, since such key installations are protected by strong military assets.



Forecast of global crude oil extraction
Source: German Federal Institute for Geosciences and Natural Resources

Scarcity and concentration of oil resources

Fears about delivery shortages are also due to the awareness that the supply of oil resources is limited. The situation will come to a head when the maximum level of oil extraction is reached, if not before. In some areas outside of OPEC and the former Soviet Union – such as the US and the North Sea – the peak extraction rate has already passed. The known reserves are thus increasingly concentrated in the "strategic crescent" stretching from the Middle East across the Caspian Sea to Western Siberia – regions that are considered politically volatile.

There is a controversial ongoing debate on the question of when the global maximum extraction rate will be reached. Although the advent of "Peak Oil" has been announced several times in the past, that point has not yet been reached. The reason is that discoveries of new crude oil reserves have constantly pushed back the assumed point of peak extraction. While pessimists expect petroleum extraction to peak before 2010, the International Energy Agency (IEA) – supported by most experts – believes that the maximum level will be reached in about 20 years' time. The global supply of crude oil will be able to meet the increasing demand, which is being stoked by China and India in particular, until the year 2030. The German Federal Institute for Geosciences and Natural Resources is slightly more conservative in predicting that oil extraction will peak in about 15 years.

Even after extraction levels peak, crude oil will still be available. In view of the currently known conventional sources of petroleum (about 150 billion tons), stocks should suffice for another 40 years. If one adds to these other non-conventional and less easily accessible sources of crude oil, such as heavy oil, tar sands, and oil shale, resources are likely to last another two decades more. Extraction of non-conventional oil, which is more complex and expensive, is only economically viable when oil prices are high, but becomes more economically attractive as extraction technology grows more sophisticated. Finally, in addition to known reserves, the estimated total remaining petroleum deposits are assumed to be even larger. If these assumptions prove to be correct, the remaining stocks will last even longer.

Scarcity of petroleum, after all, does not imply the end of fossil fuels. Natural gas deposits have not been exploited anywhere near as vigorously as oil fields, and can be expected to last at least another 60 years. This would be enough to stabilize the global economy during a transitory phase despite dwindling crude oil stocks. Furthermore, coal is experiencing a renaissance. Here, the known reserves (black and brown coal) can even be expected to last for 150 to 200 years. Also, coal (unlike petroleum and natural gas) is evenly distributed, not concentrated lopsidedly in crisis regions. The world's largest deposits are to be found in the US.

Resource conflicts or cooperation?

Regardless of whether crude oil lasts another 40, 60, or 80 years, it is certain that this resource is dwindling and that competition over it will become more intense. However, such conditions need not imply the advent of "oil wars" between the great powers. Due to their strong dependency on petroleum, major consumers such as the US, Japan, and the EU, and increasingly China and India rely on the greatest possible degree of stability in the world markets. Any factor that threatens this stability drives up prices and threatens investments.

It would be just as unrealistic, however, to assume that the great powers will cooperate more closely in the future on energy matters. China's policy exemplifies some of the problems involved: In order to sustain current economic growth, Chinese state-controlled energy utilities are making large-scale investments in all regions of the world, with Beijing exhibiting little compunction about negotiating with dictators and regimes criticized in the West. For example, the country recently signed energy contracts worth billions of US dollars with Iran. Such Chinese-Iranian agreements not only subvert US efforts to impose economic sanctions on Iran, but also prove that Tehran has long ceased to depend on the West as its only trading partner. China and India represent genuine alternatives for Iran as well as other Middle Eastern countries, and, in addition, do not demand democratic reforms.

The real potential for energy conflicts is most likely to be found at the local or regional levels. The situation in the oil- and gas-rich states of the Middle East or the former Soviet Union is evidence that resource wealth has negative consequences for democratization processes and the evolution of a free society, and detrimental effects on innovation and social reforms: The huge profits from the trade in natural resources largely disappear into the pockets of powerful elites. Besides this social injustice, which has the potential to trigger domestic conflicts, many states (such as Russia and Venezuela) also use oil revenues to expand security forces and the military, which may disrupt regional balances of power.

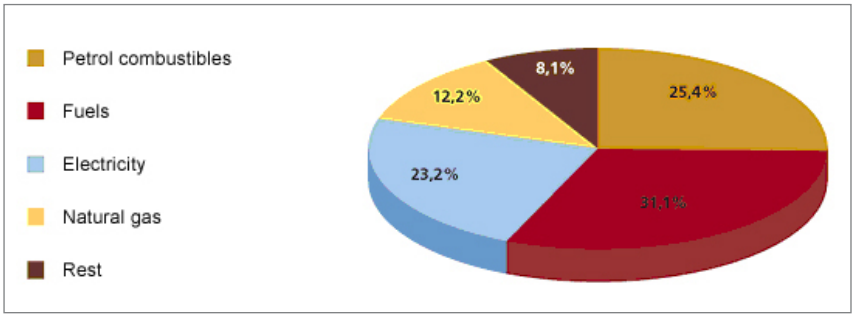
Europe: Increasing dependence on Russia

The scarcity and rising cost of crude oil means that Russian gas is becoming more and more important as a strategic energy source. Unlike petroleum, which – once extracted and filled into barrels – can be used to react in a relatively flexible manner to fluctuations in global supply and demand, the market for natural gas is still largely regional to date. Producers and consumers are linked by a pipeline network and thus highly interdependent. The elaborate procedure for producing Liquefied Natural Gas (LNG) is likely to become an attractive proposition for the global market of the future (e.g. the US and Japan). This is only partly true for Europe, since the transfer via continental pipelines will remain cheaper than production of LNG.

Currently, Europe cannot do without Russian gas. The EU imports 50 per cent of its gas (and 30 per cent of its crude oil) from Russia. The rest is supplied by Algeria and Norway. By 2030, consumption of natural gas in the EU will increase by more than 50 per cent, while natural gas extraction within the EU will drop off dramatically. At the same time, the reserves of Algeria and Norway will not be sufficient to cover the increasing energy demands of Europe. Because Europe does not want to rely too heavily on gas from the volatile Middle East (especially Iran), Russia (which controls 30 per cent of global natural gas reserves) will remain an important energy partner. This is also true for Switzerland: While it obtains more than 50 per cent of its natural gas from Germany and only nine per cent directly from Russia, 80 per cent of the gas delivered by Germany is of Russian provenance.

The risks resulting from Europe's dependence on Russian gas were seen in January 2006, when Moscow ordered a suspension of all natural gas deliveries to Ukraine, the most important transit country for Russian gas destined for Europe. This caused serious supply shortages in a number of European countries. In the Western media, pundits warned that the Kremlin could use the "energy weapon" against Europe as well. Such a scenario cannot be fully excluded. However, it would cause disproportionately more damage to Russia than to Europe, which is Moscow's main trade partner.

The real problem is that Europe is predominantly counting on Russian gas, even though that will not suffice to meet increasing demand. The IEA estimates that merely to maintain the current extraction rates, the Russian gas sector requires investments of about US$300 billion over the next 30 years. Instead of modernizing the antiquated infrastructure and exploring new fields, the Kremlin has in the past years broken up lucrative private energy companies and pushed out foreign energy firms and investors. Furthermore, Moscow has set itself the target of increasing its gas exports to Asia from 3 to 30 per cent by 2030. This means that Russian gas will become even scarcer, a shortfall that will also be felt in Europe.



Distribution of final consumption in Switzerland 2005, by energy resource
Source: Swiss Federal Office of Energy (SFOE)

Implications for Switzerland

Energy issues are gaining relevance for security policy across the globe. The problems facing Switzerland are, however, mainly in the areas of energy and economic policy. The central challenge is to elaborate a strategy that guarantees long-term secure energy supplies while being cost-effective as well as environmentally and socially acceptable. The decision on a desirable energy mix will come to a head beginning in the year 2020 at the latest. At that point, a series of long-term contracts with France on energy deliveries will expire, and the power plants at Mühleberg and Beznau will reach the end of their operational lifetime and be shut down. The status quo could be extended by making up for delivery shortfalls using natural gas and nuclear energy. The advantages and disadvantages of both options must be carefully considered: Should Switzerland wean itself off its dependency on crude oil, only to find itself dependent again on natural gas from Russia (or the Middle East)? Is it a good idea to pursue nuclear energy again more forcefully, even though it is not only very expensive, but also entails well-known risks?

But what are the alternatives? Imports of fossil fuels can be partly reduced by increased energy efficiency. Experts believe that buildings can be made 50 per cent more energy-efficient, and that vehicles and industry can save another 20 per cent. Additionally, renewable energies (hydro, wood chips, biomass, geothermal, solar, and wind power) can replace some fossil fuel imports. Nevertheless, even determined energy savings and targeted fostering of renewables may not be sufficient to make up for shortfalls in the future.

For the time being, there is no recipe for resolving these problems. In order to set the future course in a timely manner, the Swiss Federal Office of Energy (SFOE) has begun elaborating an energy strategy and commissioned preparatory studies with a planning interval until 2035 and a vision paper for the period up to 2050. These studies should present a solid foundation for a political debate that should also include the public and the business sector. In order for this debate to gain traction, however, politicians must do their part to initiate discussions with the necessary degree of urgency.

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