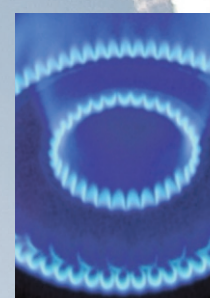


Tapping global energy stocks

Energy security challenges are topping the policy agenda of the EU and China. Consequently, policy makers of both energy import-dependent polities continue to look for new possibilities. From supply diversification and alternative energies to improved efficiency, the EU and China are well positioned to cooperate to ensure security of supply and develop high-end renewable technologies.

Mehdi Amineh and Yuang Guang



AS ENERGY REMAINS KEY to the accumulation of wealth and power of states, but energy sources become increasingly scarce, it is not surprising to find that energy security challenges are topping the policy agenda of the European Union (EU) and China. In response, policy makers of both energy consuming economies continue to look for new possibilities. These include not only the diversification of source and origin to encourage supply security, but also support for substitutes of fossil energy and improving efficiency in energy use. In this endeavour, the urgency of geopolitical concerns seems to catch more attention than long-term plans of transitions to renewable energy systems. Consequently, the perception that the EU and China might be competitors in the geopolitical arena for access to foreign resources seems to overshadow their common interest in developing renewable energy and sharing efficiency-improving technology. However, such a view neglects that, at the same time, the EU and China are well positioned to cooperate to ensure global oil supply and compete in the development of high-end renewable technologies.

The new joint research programme¹ of the Energy Programme Asia² (EPA), the Netherlands, in cooperation with the Institute

of West Asian and African Studies, (IWAAS), China, challenges such dominant perceptions and aims to provide the wider public with a more balanced account of EU – Chinese energy relations.

EPA's research programme represents a comparative study on the geopolitical and domestic challenges to energy security for the EU and China and their impact on energy security policy strategies in both economies. The aim is to study the geopolitical effects of competition and cooperation for access to oil and gas resources among the main global consumer countries and the domestic opportunities and impediments for policies to increase energy efficiency and exploit renewable and alternative energy resources. The outcome of the research programme will be published in two volumes in 2009 and 2011. The main focus of the upcoming volume (2009) relates to the geopolitical aspects and the follow-up volume (2011) focuses on the prospects of alternatives to fossil fuel energy. In this special edition of *the Newsletter* we present some preliminary results of the upcoming volume. This introductory article provides the background knowledge on global energy markets necessary to understand the geopolitical and domestic challenges for the EU and China discussed in the subsequent articles of this special edition.



Fig. 1 (Left)
Yuang Guang (left)
and Mehdi Amineh
(right) from the Energy
Programme Asia.

Energy security challenges for the EU and China

Global energy security challenges

Global primary energy demand, according to the Energy Information Administration's International Energy Outlook (EIA IEO) 2008 is projected to increase by 50% between 2005 and 2030, although greatly dependent on the level of economic growth until then. It is predicted that by 2030 more than 25% of world energy demand will come from developing Asia, particularly China and India (18% in 2005). By contrast, the share of the US in world consumption is expected to diminish between 2005 and 2030 from 22% to 17%. According to EIA IEO 2008 estimates, world oil consumption will rise from 84 million barrels per day in 2005 to 113 million in 2030. The EIA also anticipates a substantial growth in the global consumption of natural gas for the period 2005-2030 from 104 trillion cubic feet (tcf) in 2005 to 158 tcf in 2030. The import dependency of the EU and China will grow to about 70% of domestic consumption in 2030 (EU Green paper 2006 and EIA IEO 2008).

In the period to 2030, global oil and gas supplies are predicted to originate in fewer countries than today. This is due to the fact that proven oil and gas reserves are unevenly distributed in the world and only a few countries remain surplus producers. The total global oil stock on January first 2008 was estimated at 1,332 billion barrels (bbl) proven oil reserves, around 70% of which is located in OPEC countries, and 30% of which in non-OPEC countries. Just five countries (Saudi Arabia, Iraq, the UAE, Kuwait and Iran) hold about 55% of global proven oil reserves. So far the Gulf has been a critical factor in meeting global demand followed by the states of the former Soviet Union. It is expected that world oil supply will need to be 28 million barrels per day more in 2030 than in 2005. To meet this demand OPEC and non-OPEC countries combined are expected to produce 49 and 63 million barrels per day respectively, according to the EIA IEO 2008. This results in a market share of OPEC of 44% in 2030 and continues a longstanding growth trend. Moreover, non-OPEC supplies are maturing which results in an increasing call on OPEC oil in the very long term.

Proven gas reserves are slightly less concentrated than oil reserves. Russia (including the Caspian Sea region) and the Middle East represent about 1/3 and 2/5 of proven global reserves respectively. Moreover, Russia and Iran held about 42.5% of the global gas reserves on January first 2008 (EIA IEO 2008). The Middle East has a substantial gas potential, but it is largely untapped. This is due to the difficulty or cost at which these gas reserves can be developed and brought to market. Compared to the international oil market, the international gas market is still very much a regional market, divided into Asia's LNG market, the Russian-European market and the North American market. Non-OECD Europe and Eurasia and the Middle East account for around 40% of global production in 2005 and are expected to account for 45% of the increase in production between 2005 and 2030. OECD countries share of global production will decline from 39% to 27% over the same time period. Hence, it is estimated that by 2030 supplies of gas for the world market will originate in fewer countries than today because some of the existing sources will dry up.

Global oil and gas markets are looking bleak as the result of ever-growing energy consumption, a growing exhaustion of reserves and an increasing geographical concentration of production. Against this background it is likely that state and non-state actors will assign more significance to economic and resource concerns and energy relations will become increasingly politicised. On the one hand, the growing energy import of countries such as China and India, adds to that of the EU and the US and these regions start to compete for access to reserves. The anticipation of future supply disturbances is already reflected in generally rising oil and gas prices, especially their volatility, and the inelastic demand of major consumers. Moreover, the competition increasingly involves bilateral contracts as the ongoing renationalisation³ of energy industries in producer countries causes a reliance on transnational energy corporations and the market misplaced. On the other hand, based on the increasing fossil fuel scarcity (and the sense of 'peak-oil' drawing closer), a geographical concentration of energy reserves and supplies is expected to materialise in the politically unstable producer countries of the Persian Gulf, and the Caspian Sea region, including Russia. This changes the overall balance of power in the relationship between energy producer and consumer countries in a way that strengthens the former. Unfortunately, internal conflicts are likely to arise in countries where oil and gas are the main source of income, especially when accompanied by ethnic hostility, terrorism, religious extremism, economic injustice, corruption and political competition. Both competition and cooperation for energy supplies among consumer countries and between consumer and producers countries are likely to become more intense in the coming decades; the more so because policy responses of consumer countries cannot be seen in isolation of each other.

In the period to 2030, global oil and gas supplies are predicted to originate in fewer countries than today.

Summing up, the combination of increasing oil and gas consumption, decreasing reserves and geopolitical rivalry creates a setting for both the EU and China that can be characterised as one of demand-, supply- and structural scarcity or a combination thereof (see, Amineh and Houweling 2005: 80-81). Demand-induced scarcity refers to a situation in which population growth, a rising per capita income and technological changes resulting in higher levels of consumption and technological change that renders fossil fuels more essential for the production of wealth and power, increase domestic demand for fossil fuels. Supply-induced scarcity refers to a situation in which a decrease of the stock (or market-efficient access to it), inefficient use of supplies and a lack of adequate productive capacity and pipeline infrastructure, decrease the supply of energy resources. Structural scarcity refers to a situation in which there is a supply induced scarcity caused by deliberate action of a major power, non-state actors, like transnational oil companies and producer cartels like OPEC. For example, in the current unipolar military order, the US can opt to induce scarcity for allies and competitors alike by interdicting the maritime transport of oil and gas. That option, however, is available only after oil and gas have been brought to ports and ships from the territory of extraction. Russia, on the other hand, has already demonstrated to the EU in both Russian-Ukrainian gas crises what a pipeline monopoly can imply to security of supplies.

Energy security is also affected by environmental constraints and advances in technology. According to the IEA World Energy Outlook (WEO) 2006, global CO2 emissions are expected to accelerate by 55% between 2004 and 2030 (1.7% annually). Emissions are growing faster than energy demand. This is alarming because it stands in contrast to a 25 year long opposite trend towards cleaner energy sources and exemplifies that our future energy use will be more 'dirty'. A likely cause is the switch back to coal occurring in response to the oil and gas scarcity of many countries. Coal resources are more abundant and geographically less concentrated, though have higher levels of carbon than oil and gas. This shift coincides not accidentally with the fact that developing countries are overtaking OECD countries as the biggest emitters of CO2 shortly after 2010 and will reach more than 50% of global emissions by 2030. China alone is expected to represent 39% of the rise in emissions until then.

Where pollution creates cross-border tensions, innovations in alternative and renewable resources, alongside efficiency measures, can reduce energy import dependence and contribute to reducing greenhouse gas emissions. However, developing new technologies involves more than a simple replacement of oil and gas by other energy sources. The deployment of solar, wind, hydro, geothermal and hydrogen requires building new production facilities, new storage and distribution means and end-use applications. Apart from time and money, such energy infrastructure transitions also necessitate continued government and popular support, especially when it is likely to be driven by social, political and environmental benefits and the technical and economic side cannot yet compete with existing fossil fuel technologies. On the other hand, existing alternatives like biofuels and nuclear energy face considerable social and political challenges on their own.

In the end, it is expected that even by 2030 the role of renewables in the global energy mix will be marginal at best. The IEA WEO 2006 states that while renewables and alternatives today cover 19% of global primary energy supply (if one includes nuclear and biomass; renewables alone is 3%), by 2030 this will still be only 19% (and 4%). This is not because of a lack of development of renewables, but simply because global oil, gas and coal consumption will also continue to rise. Nevertheless, as oil and gas become increasingly scarce, developing innovative technologies is the only long term alternative.

The way forward

The abovementioned energy security challenges urge the EU and China to respond. The obvious questions to be answered are how they (should) do so and what the impacts of their energy security policy strategies on each other are. To this end, the following selection of articles in this special edition of the Newsletter provide insights into the various geopolitical and domestic challenges for both polities and EU-China energy relations and allows for speculating where possibilities and impediments for cooperation lie:

In the first article, *China's policy and measures to secure the supply of oil: the case of Saudi Arabia and Sudan*, Chen Mo deals with China's energy policy and the question of, on the one hand, focusing on policy towards easier access to oil or, on the other hand, towards diminishing dependency from oil.

In the second article, *China's energy security and student attitudes*, Eduard B. Vermeer discusses China's energy policy, placing it in the context of both domestic and international

security. Moreover, he argues that the Chinese energy agenda is mainly aimed at increasing independence, both now and in the future.

The third article, *Russia's emerging place in the Eurasian hydrocarbon energy complex*, by Robert Cutler, deals with Russian energy policy towards the Central Asian region, the EU, and China, distinguished by the increasingly acute competition between Russian and prospective non-Russian networks for provisioning Europe with natural gas and crude oil from the Caspian Sea basin.

In her article, *The energy policy of the Islamic Republic of Iran towards the European Union and China*, Eva Raket discusses relations between Iran, the EU and China. In light of the desired cooperation Iran needs to overcome several obstacles, while the EU and China simultaneously should join hands in order to secure access to energy resources.

In *Courting the prize in Pakistan: India, China and the geopolitics of Iranian gas*, Philip Sen deals with the question of how the energy interests of India and China, both facing rising energy demands, may intersect.

In the sixth article, *Japan's evolving nuclear energy policy and the possibility of Japan-China nuclear energy cooperation*, Raquel Shaoul discusses energy relations between Japan and China. Nuclear cooperation is increasing being viewed as an interesting way to improve energy security for both countries, as well as possibly positively influencing political relations more broadly.

The seventh article, *Transition management and institutional reform* by Daniel Scholten, deals with the transition to sustainable energy, stressing besides technological development also the institutional aspects needed for such a change.

Finally, in *The EU-China energy relations and geopolitics: the challenges for cooperation*, Frank Umbach deals with the need for both the EU and China to balance energy priorities with economic and environmental objectives.

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Notes

1. This is a joint research programme between the Energy Programme Asia (EPA) of the International Institute for Asian Studies (IIAS) and the Institute of West Asian and African Studies (IWAAS), in cooperation with the Institute of Industrial Economy (IIE) and the Institute of Russian, East European & Central Asian Studies (IREECAS) of the Chinese Academy of Social Sciences (CASS). This research programme is supported by the Royal Netherlands Academy of Arts and Social Sciences (KNAW) and by the Chinese Academy of Social Sciences (CASS) for the duration of three years (2007-2010).
2. The objective of the EPA research programme is to study the geopolitical and domestic aspects of energy security challenges for the EU and the main Asian energy-consuming countries. Special attention goes to the impact on global energy supply security strategies, energy efficiency measures and the possibilities of alternative and renewable resources.
3. Oil and gas companies are already state-owned in most Middle Eastern OPEC states, having recently been nationalized in Russia and Venezuela and subject to government control in China and India.

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