

The Geopolitical Impact of Unconventional Hydrocarbons

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According to various reports and prospective studies published by the International Energy Agency (IEA) and the US government (see references), the main geopolitical effects derived from unconventional oil and gas exploitation and trade can be summarised in the following points:

Unconventional Oil

At the end of 2011, excluding liquid fuels derived from coal and natural gas (CTL and GTL respectively), the estimates of recoverable unconventional oil resources and reserves worldwide, slightly exceed the volume of conventional oil reserves and resources.

Not counting CTL and GTL resources, the industrialised OECD countries, which only hoard 15.6% of the total resources of technically recoverable global crude oil and natural gas liquids, contain 62% of unconventional oil resources. In late 2011, these were located primarily in North America, Eastern Europe-Eurasia and Latin America, counteracting the geopolitical importance of the Middle East, a region that accounts for 42% of conventional oil reserves and resources. However, it is worth noting that the potential conventional resources in the Middle East region remain unexplored.

The forecasts for the period 2012-2035 indicate that the share of conventional crude oil in overall oil production will fall from 80 to 65%. The growth in production needed to cover demand must therefore come from other sources. Among these, togeth-

er with natural gas liquids, are the unconventional oil supplies, whose contribution could multiply by three in the aforementioned period. These unconventional supplies would come mainly from US light tight oil (LTO) from the Canadian oil sands and Venezuelan extra-heavy oil.

Up to 2020, oil production in non-OPEC countries will maintain its upward trend. Both conventional and unconventional oil production will increase, but the former will reach its peak shortly before 2020 and then decline a few years later to the extent that even an increase in unconventional oil production will not be enough to turn this downward trend around. Total oil production between 2012 and 2035 will fall in most non-OPEC countries, with the exception of Brazil, Canada, Kazakhstan and the US, although production in the latter will go into decline before 2035. From the mid-twenties onwards, OPEC will once again occupy a key position in the global oil supply. From then until 2035, production in the ultra-deep waters of Brazil and of LTO in the United States will lose steam, the Middle East will stand as the sole source of relatively cheap oil in the world and Iraq will become the largest contributor to overall output growth.

With regard to both conventional and unconventional oil, the balance of production during the 2012-2035 period, clearly favours Iraq, Brazil, Canada, Kazakhstan and the United States, while at the opposite end are Russia, China, Norway, the United Kingdom, Oman and Azerbaijan, with Kuwait and Argentina lagging quite behind. Moreover, Venezuela, Qatar, Saudi Arabia and the United Arab Emirates will remain in a balanced position.

In 2035, the percentage share of OECD countries in terms of global oil demand will fall to approximately 32% as compared to 46.6% in 2012. In China, however, the oil use has significantly increased, so that in

2030, this country will overtake the US as the largest global consumer. Likewise, India emerges as a key centre for oil consumption, especially between 2020 and 2035, a period during which this country will experience the largest growth in global demand. Another relevant issue is that the Middle East will become the world's third largest centre in terms of oil demand.

In the next two decades, the changing geography in oil production and consumption will lead to a major reorganisation of global trade. Oil flow destinations will move from the OECD, where Europe remains the sole importing market, to Asia. In 2035, the two largest global oil importers will be China and India, while the percentage of US involvement in inter-regional trade in crude oil will decline from 27% today to 15%. This reorganisation of trade flows will require a reassessment of security policies for the oil supply. The big Asian countries will have to engage more in preventing and managing the effects of possible disruptions in the global supply of crude oil.

Unconventional Gas

Without accounting for gas hydrates, it is estimated that the reserves and recoverable resources of unconventional gas are equivalent to about three-quarters of that of conventional gas. At the end of 2012, shale gas represented approximately 61.8% of the total technically recoverable unconventional resources, pending extraction, compared with 23.6% for tight gas and 14.6% for coal-bed methane or CBM.

Approximately 27.7% of unconventional gas resources are located in the Asia-Pacific region, 19.2% in the US and Canada, 16% in Latin America, 13.4% in Eastern Europe-Eurasia, 14.2% in Africa, 5.5% in European OECD countries, and just 3.8% in the Middle East. This distribution will contribute to balancing the excessive concentration of conventional reserves and resources in Eastern Europe-Eurasia (mainly in Russia) and the Middle East, which account for around 30.6% and 26.5%, respectively, of the world's reserves and technically recoverable resources of conventional natural gas. However, it must be noted that the volume of unconventional gas resources in the Middle East is yet to be evaluated.

Between 2011 and 2035 natural gas production will grow in all regions around the world, with the only exception of Europe, where the increase in production in Norway will not be enough to offset the decline in other mature fields. China, the US, Russia and Australia (in that order), followed by Qatar, Iraq, Brazil, Turkmenistan, Iran and Algeria will experience the greatest increase in production. Although the US and Australia will register large increases in their production thanks to unconventional gas resources, both countries becoming net exporters, the countries outside the OECD will be responsible for around 81.75% of the growth in production.

52% of the total increase in natural gas production forecast worldwide between 2011 and 2035 will come from conventional gas, while the remaining 48% will come from unconventional sources. The forecasts are that, as of 2020, the development of unconventional gas production will spread beyond North America (the US and Canada), turning China and Australia into the largest contributors to global output growth, followed by other countries like Argentina, India, Algeria, Mexico and Indonesia; the European Union with a position slightly above the latter three countries. Unconventional gas, which in 2011 represented around 17% of the world's total natural gas production, could reach 27% in 2035. The natural gas markets that will experience the fastest growth between 2011 and 2035 are those located outside the OECD. Countries outside this organisation will be responsible for more than three-quarters of the growth in demand during the aforementioned period, with the maximum growth in absolute terms being concentrated in China and the Middle East. In the OECD countries, although consumption will increase, the growth rates will be less due to market saturation and the effects of the penetration of renewable energies in the energy sector in Europe. Despite this, the OECD markets will continue to be comparatively large, so that, for example, in 2035, demand in the US, still the largest consumer worldwide, will be 50% higher than in China. Inter-regional natural gas trade will continue to grow throughout the period 2011-2035, during which, based on the exploitation of their unconventional resources, certain new exporters will become increasingly relevant, such as Australia, the US and Canada, thereby posing a competitive challenge to the classic exporters, like Russia and Qatar. During the course of

the period 2011-2035, we will also be witness to a continual change in the direction of the international trade in natural gas, whose import focus will move from the Atlantic basin (with the notable exception of Europe that will continue to be the world's biggest importing region) towards the Asia-Pacific region.

Just under half the increased international trade in natural gas expected for the period 2011-2035 will be carried out via gas pipelines. This flow will hardly be affected by the advances in unconventional gas production and its main developments will be seen in Eurasia.

While natural gas trade via gas pipelines will continue to be dominated by just a few producers, basically located in Eurasia (Russia, Azerbaijan and Turkmenistan), the group of exporting countries of liquefied natural gas (LNG) will undergo a major re-organisation. Some of today's LNG exporters are already experiencing a rapid growth in internal demand, thereby limiting the volume available for exports. This trend is particularly evident in the Middle East, so that in 2020 only Qatar and Yemen will remain as exporters (to which perhaps Iraq could also be added). Other countries that for the same reason could cease to be exporters are Egypt and Trinidad & Tobago. Moreover, the market will see the appearance of new actors, notably including Australia, the US and Canada, major producers of unconventional gas. Furthermore, Russia could expand its share in the LNG market directing its exports towards Asia.

Unconventional Hydrocarbons and Energy Dependency: the Divergent Paths of the US and Europe

According to the sources consulted, one of the consequences of the surge in unconventional oil and gas production in the US is that throughout the period 2011-2035 this country could become self-sufficient and turn into a net gas exporter, while at the same time reducing its dependency on oil imports to 20% of its total consumption. This trend contrasts sharply with all other countries and regions, with the exception of Brazil, which will also experience a net positive development based on the exploitation of its conventional hydrocarbon resources.

Unlike the United States, the European Union shows a particularly negative development, as its dependence on gas will rise from 60% in 2011, to 80% in 2035, while dependence on oil imports will rise during the same period from 80% to close to 90%. Beyond the implications for supply security, these data imply much higher energy prices in the European Union, which will undoubtedly represent a heavy burden for the competitiveness of its industry and a significant fall in its citizens' purchasing power.

China and India, like other Asian countries and regions show a similar trend to that of the European Union in their degree of dependency on hydrocarbon imports, although theirs is less dramatic, while the major conventional hydrocarbon producing countries in the Middle East, Russia, Africa and the Caspian region will see hardly any variations in their positions.

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