



Changing prospects for Russian oil and gas

By Dr Tatiana Mitrova, Head of Oil and Gas Department
Energy Research Institute of the Russian Academy of Sciences

Russia is one of the world leaders as far as crude oil and natural gas production are concerned and it plays the key role in the international hydrocarbons trade. In 2000-2010, the country had been dynamically raising its exports – oil exports grew by 70 per cent, while gas exports increased by 15 per cent during the same period. Oil production increased by more than a half and exceeded 500 million tons per year, annual gas production increased by 10 per cent. The revenues from oil and gas exports reached more than a quarter of Russia's GDP and amounted to one-third of the country's budget.

Now, however, the Russian oil and gas industry is entering a new stage of its development. These changes are the result of the coincidence of several factors: the global economic crisis and the demand slowdown in domestic and foreign markets, the US shale revolution, increased supply of hydrocarbons, the depletion of the Soviet era's cheap fields and the necessity to explore new hard-to-reach and expensive-to-develop oil and gas provinces. As a result, the oil and gas industry is going through a difficult transition period, the success of which would define not only Russia's position in the global energy market, but also its economic welfare.

Changing external environment

The new *Global and Russian Energy Outlook up to 2040*, prepared by the Energy Research Institute of the Russian Academy of Sciences (ERI RAS), assesses how recent global energy market trends affect Russia's energy sector and economy. The situation is really becoming less favourable:

- The consumption of primary energy in the world will increase by 1.1 per cent per year on average between 2010 and 2040, which is significantly slower than the growth in energy consumption seen for the last 30 years. OECD countries (the most mature and lucrative markets) will only increase their energy consumption by 3 per cent by 2040.
- The development of the world's energy trade will continue against the background of North America's growing self-sufficiency, due to unconventional oil and gas resources.
- Different types of unconventional liquids will cover more than 70 per cent of the incremental supply on the liquid fuels market. Unconventional oil (shale oil, tar sands oil, etc.) will reach up to 16 per cent of total production and dramatically change the entire structure of the global oil trade and pricing.
- Further expansion of unconventional gas production is expected, which by 2040 might account for 15 per cent of world gas production.

- By 2040, LNG will provide for nearly 60 per cent of the inter-regional gas trade. New major players in the LNG market will emerge (the USA and Canada; Australia and East Africa), which could significantly affect traditional pipeline exporters like Russia.

- The European market, which is key for Russia, is in stagnation with a clear decline in the consumption of liquid fuels and gas. The reduction in the domestic production volumes in Europe would undoubtedly require increased imports, but this increase will be at a much slower pace than before.

- The focus of the energy consumption growth is shifting to Asia, whose markets are very specific and where Russia lacks infrastructure and experience in commercial contact.

- There is an increased competition among the suppliers of the regional markets.

These transformations in world hydrocarbon markets bring extra risks for Russia's economy and energy sector. Russia will be more sensitive to negative market fluctuations – reduced demand, increased supply and, especially, price volatility. High costs and the current tax system hamper the competitiveness of Russian energy resources in external markets. The problem is not one of resource availability or production potential, but related to the above-ground factors: costs and taxes. It is the first time the Russian energy sector has to work under such difficult conditions.

According to the ERI RAS estimates, the potential decrease in revenues from gas exports – and even more, those from oil exports – could reduce the contribution of hydrocarbon exports to GDP by a third. Strong multiplier effects peculiar to these industries, and a decrease in the flow of foreign capital, might significantly enhance the impact of this decrease in export earnings, and reduce the development of the economy by one per cent per year.

Changing internal situation

The domestic market is undergoing dramatic changes as well. On the one hand, the slower development of the national economy leads to the inhibition of industrial production and domestic energy demand. On the other hand, the Russian oil and gas sector is now coming to the point of exhausting the capacities created in Soviet times. Most Russian production is based on the discoveries made during the Soviet era – 90 per cent of Russia's current oil is from fields discovered prior to 1998.

The situation is aggravated by the fact that newly-

discovered oil fields are located mostly in remote areas with severe climatic conditions and other difficulties. Therefore, significant investments are required to develop them. Further, the production dynamics would depend largely on companies' ability to introduce new fields into operation in due time and the pace of introducing state-of-the-art technologies to maintain production levels at existing fields.

For the Russian oil industry, the major challenge is the big decline in the production rates in the existing oil fields. In the 2000s, the pace of this decline significantly increased, reaching an annual rate of 11 per cent. To maintain the production volumes, it is necessary to constantly introduce new fields into development. In the recent past, this was achieved by the development of such fields as the Vankor, Talakan, and Verhnechonsk fields. However, to overcome this natural annual production decline in the future, it is necessary to introduce 3-4 fields into operation, each of them equal to the Vankor field in size.

In these conditions, one of the main ways to maintain the level of oil production in Russia would be the increase in oil recovery from the existing fields. Currently, the country's recovery factor of 20 per cent puts Russia well behind such countries as the US (43 per cent) or Norway (50 per cent). A recovery rate raised to these levels would add significant reserves, which furthermore are located in areas with existing infrastructure. However, the use of tertiary oil recovery techniques is not cost-effective under the existing tax regime.

The development of stranded oil reserves (in the first place – the Bazhenov shale oil) and the Arctic shelf may also contribute to the stable production. However, these are long-term projects, which would not pay off before the end of the 2020s. They would also require the development of major technological competencies, greater involvement of foreign partners, as well as creating a favourable regulatory environment (low taxes and ease of access) that are currently not in place.

The gas sector undoubtedly has capacities for sustainable production growth. The resource base is trouble-proof and sufficient to meet the domestic and export demands. But the main hindering factor here is the demand. The gas sector, like the oil industry, currently faces a rapid decline in production from existing fields, and to compensate for its falling volumes, it will be necessary to develop new huge and expensive fields in Eastern Siberia (Chayanda, Kovykta, new fields in Sakhalin) and in the Arctic (Yamal, Shtokman).

How can Russia cope with these challenges?

A truly effective means of countering external challenges would be a dramatic increase in both the investment efficiency of the Russian energy sector and in the energy efficiency of the economy as a whole. Russia has unique potentialities in respect of both these courses of action. Indeed, the Russian energy sector has already undertaken huge capital investments, which will grow in accordance with approved plans to reach an unprecedented 6-7 per cent of GDP (the global average is about 1.3-1.5 per cent of GDP). However, Russia's national economy has one of the world's lowest ratios of GDP output per unit of consumed energy (three times less than the global average). The elimination of such wastage is becoming critical now.

Another chance to increase competitiveness of the Russian oil and gas sector is a radical reduction in the costs of investment projects, together with a thorough evaluation of their cost-effectiveness and potential risks. It is necessary to rank all investment projects and reject or postpone the implementation of inefficient ones. This is confirmed by the results of work done by foreign and Russian experts, who analysed the cost of domestic energy projects, showing that they were typically several times more expensive compared to similar projects elsewhere, while those projects that were completed were underutilised for years.

Not surprisingly, even official scenarios of the Energy Strategy, produced in 2009, predict just a slight increase in energy exports by 2020, followed by stagnation and decline in total export volumes. According to the Energy Strategy, the volume of oil and petroleum product exports will fall, while gas exports (especially LNG) will rise, gas production will exceed 900 bcm per year by 2030 and oil production will stabilise at close to current volumes – 500m tons per year.

According to the ERI RAS estimates, due to external constraints, Russian oil exports would only grow slightly over the next decade and reach their peak in 2020-2025. Afterwards they would face a sharp decline, if the country were not to adopt major tax reforms, review the priority of projects and introduce strict cost control. By 2030, oil production could be 15 per cent lower than in 2010.

The gas sector is expected to show steady production growth, albeit at a slower pace than previously predicted. By 2030, production would rise by 20 per cent, and export volumes by 12 per cent (mostly, towards Asia). However, even with these more modest production and export volumes, Russia will remain the world's largest hydrocarbon supplier. □