



ENHANCING INVESTMENTS IN ENERGY INFRASTRUCTURE: RUSSIA'S PERSPECTIVE

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Each country develops its energy sector on the basis of its national priorities and specific external factors, such as market situation, technological advances and trends in international energy and climate policy.

The world energy landscape is greatly influenced by the rapid development of technologies of energy production: the large-scale production of shale oil and gas and explosive development of the renewable energy industry in different regions of the planet are only two of the most illustrative examples of this change.

The shifts in global energy flows and the rapid development of unconventional energy resources require new functional stability, reliability, and long-term predictability of all elements of existing and newly-established energy chains, from production and transportation to energy efficiency. It is important for all market players to understand that this struggle for global and regional energy security leaves no winners and losers, but all will ultimately either win or lose.

Total investments in the hydrocarbon, renewable energy, and electric power sectors in the last 5 years are estimated at US\$1.5 trillion. By the year 2035, total investments in the energy industry and energy efficiency may exceed US\$48 trillion. Thus, in the foreseeable future the energy industry will continue to be one of the main drivers of the global economy, creating conditions for better quality of people's lives all over the world. The fact that energy has been included in the UN development agenda as a separate goal highlights its importance for global economic progress and sustainable development.

Trends in Energy Industry Development

The distribution of investment flows depends to a large extent on the trends of energy industry development, the most significant of which are detailed below.

The first trend is diversification of sources of energy supply, which includes reducing dependence on energy imports through developing renewable energy and, where possible, increasing domestic hydrocarbons extraction. The share of fossil fuels in electric power generation is decreasing, and new technologies for production of hard-to-recover reserves are being deployed throughout the globe. According to IEA forecasts, the share of electric power generated from renewable sources will increase from 22 per cent to 33 per cent, while the share of conventional energy will decrease from 78 per cent to 67 per cent around the world in 20 years.

The development of energy production technologies, along with high oil prices over the preceding 10 years, triggered the implementation of production projects in countries where hydrocarbons had not previously been produced – for example, in Israel (gas, 2013), Ghana (oil, 2010), and South Korea (gas, 2004). Successful experimental development of deep-sea gas hydrates have been conducted in Japan, which initiated discussion about the beginning of a new era in the use of hydrocarbons.

According to expert estimates, in 2014-2035, the volume of investments in renewable electric power will be twice that of investments in fossil fuel-based electric power generation (US\$5.8 trillion vs US\$2.7 trillion). The above-mentioned processes are significantly changing the established energy balances.

The second obvious trend in global energy industry development is enhancement of energy efficiency. This process not only makes it possible to keep down the growth of global energy demand, even in the conditions of output growth, but also helps to mitigate the consequences of various shocks caused by short supply of energy resources to world markets.

Over the last decade, GDP energy intensity has decreased by 15-20 per cent in almost all advanced countries. And

The IEF is uniquely placed to satisfy the interests of all global energy market players in a fair and mutually acceptable way

over the next 20 years, about US\$8 trillion of investment is planned in the energy efficiency sector (transport, housing & utilities and production). This will allow the world economy to develop at rates which exceed the dynamics of primary energy consumption growth.

The third trend that has to be considered by investors is a shift in the energy demand focus toward the APR (Asia-Pacific Region) and, first of all, toward the rapidly growing economies of China and India. Over the last 15 years, the global consumption of primary energy resources has increased by 50 per cent, and almost all this growth has come from consumption in Asia and the Middle East. In spite of a slowdown in Chinese economic growth, all world experts agree that a trend toward leading energy consumption in the APR will continue in the medium term.

Contribution of the Russian Federation

As a major player in the energy market, Russia takes an active part in the processes of global energy industry development.

Thus, in spite of its plentiful hydrocarbon resources, Russia is working on reducing the economy's dependence on hydrocarbons in the interest of climate change control and technological base development. About half of new generating capacity in Russia is represented by hydroelectric power plants, nuclear power plants (NPPs), and renewable energy plants.

At the same time, Russian technologies for the construction of hydroelectric and nuclear power plants are much in demand, and competitive all over the world.

Today, 29 projects for the construction of nuclear power plant units of Russian design are being implemented abroad, with the participation of Russian companies. Among them are Kudankulam NPP in India, Ninh Thuan-1 NPP in Vietnam, Bushehr NPP in Iran, Akkuyu NPP in Turkey, etc. Russian hydropower equipment and technologies for hydroelectric power plant construction are widely used on almost all continents – in particular South America, Asia, Europe, and Africa.

Other renewable energy sources (RES), such as solar and wind power generation, small hydropower and biomass power generation, are actively developing as well.

By 2035, in compliance with the Energy Strategy of the Russian Federation, RES-based electric power generation shall increase by a factor of 14 (from 2 to 29 billion kWh), and the installed capacity of the corresponding power plants shall increase by a factor of 23 (from 0.4 to 9 GW). Stage 1 of the 5 MW capacity solar power plant construction was put into operation in the Altai Territory last year, and the plant output will double this year, reaching a capacity of 45 MW.

The technological base of the industry is also developing. A new fast neutron reactor (BN-800) will be launched this year at Beloyarsk NPP in the Sverdlovsk Oblast. Russian atomic specialists gained a unique experience during the construction of this reactor. An interest in the Russian technologies of fourth-generation nuclear power plant units has been expressed by specialists from France, China, and other countries.

The construction of a plant for the production of new semiconductor heterostructure-based solar batteries began this year in Russia (in the city of Novocheboksarsk). Based on the discoveries of Russian Nobel Prize winner Zhores Alferov, the new technology (4 times more efficient than



The Kosh-Agach solar power plant in Altai

the conventional one) may become a new driver for the development of solar power generation. In this context, a leading role in the development of RES technologies in Russia is assigned to small and medium enterprises.

For Russia, improving the energy efficiency of the national economy is no less important than developing non-carbon technologies in the electric power industry. Within 20 years, Russia is going to reduce its GDP energy intensity and electric intensity by factors of 1.6 and 1.4 respectively, compared to 2014. With an almost doubling of GDP growth, the consumption of primary energy in Russia will increase by less than 20 per cent.

Since 2008, the energy efficiency of the Russian economy has increased by 8.3 per cent, and the dynamics of its growth in the industries of the fuel and energy complex is even higher (by 0.5 per cent per year).

A large contribution to the enhancement of energy efficiency is made by the programme aimed at increasing the level of utilisation of associated petroleum gas (it has increased by more than 12 per cent over 10 years – from 74 per cent in 2005 to 86.5 per cent at present) and by the modernisation of electric power facilities (equivalent fuel consumption for electric power generation has decreased by 5 per cent over 6 years – from 335.5g of equivalent fuel per kWh in 2008 to 319.9g in 2014). We estimate the total volume of investments in the energy efficiency sector before 2035 at US\$240 billion.

Finally, in response to changes in the geography of energy demand, Russia is implementing a set of measures to facilitate access to Russian energy resources for potential consumers, first of all, bearing in mind the expansion of energy supplies to the APR.

These measures include:

- Revival of the Northern Sea Route, which, in particular, will allow Russia to create new, shorter and far more beneficial routes for the delivery of energy resources;
- Development of the ESPO (Eastern Siberia-Pacific Ocean) pipeline system in order to increase oil exports in an eastern direction (according to the Energy Strategy of Russia, the volume of oil supply to APR markets should more than double by 2035);
- Implementation of the Eastern Gas Programme, including the creation of four large gas production centres and the construction of gas pipelines toward China, the first of which is the *Power of Siberia*, which will help gas exports to the Asian market increase by more than a factor of 9 by 2035, from 14 billion cubic metres in 2014 to 128 billion cubic metres in 2035. The total volume of investments in the oil and gas sector before 2035 is estimated at US\$2 trillion.
- Elaboration of projects for electric power export to China, Japan, and other Asian countries, including power from East Russia's wind farm, which is being designed now. This export is expected to increase by a factor of 8 (up to 74 billion kWh) by 2035.

In each direction of energy industry development, Russia strives for close cooperation with foreign partners and invites investors from various countries of the world to take part in energy projects. In spite of the sanctions imposed on the oil and gas complex of Russia, all major foreign partners did not abandon their core assets in Russia and continue investing in them. For example, the share of foreign investors in the joint-stock capital of Russian public oil companies exceeds 26 per cent, and the total volume of investments in the oil industry in the last year (when the sanctions were already in place) increased by 10 per cent, to 986 billion rubles. At the same time, the share of foreign investors in some of the largest energy projects in Russia, such as Yamal LNG, Sakhalin-1, and Sakhalin-2, exceeds 40 per cent.

Destabilising Factors

Acting in line with the trends noted above, Russia, along with other energy market players, now faces a number of

destabilising factors which make investment decisions more difficult to take. First of all, this includes high volatility of oil prices and political tension creating artificial barriers to investments and technological cooperation.

Today, we find ourselves in the middle of a crisis of the existing institutions designed for energy market regulation and the provision of global energy security. The expanded number of suppliers and the increased supply in the primary energy market are transforming the system of traditional links between suppliers and consumers. Suppliers' decreased role in the provision of energy security influences functions of such market regulators as OPEC or the GECF (Gas Exporting Countries Forum). As a result, the sellers' market becomes a buyers' market, which to a large extent disorients investors.

In addition, investments may be influenced by:

- The raising of the key interest rate in the world's largest economies, which makes risky investments in high technologies (especially, in alternative energy) less attractive;
- Uncertainties with regard to the debts of some European countries and the slowdown of China's economy;
- Volumes of available spare capacity in the largest producing countries.

Political differences lead to outcomes which cause significant economic damage for all parties to the conflict. One recent example is the circumstances which led to cancellation of the South Stream pipeline project, originally intended to reduce the transit risks of gas supply to the countries of Southern Europe. There are also examples of artificial isolation of major energy market players through sanctions (Russia, Iran) or of the physical destruction of the integrated system of production and transportation of energy resources (Iraq, Syria, Libya). Apparently, in these cases it is probably more appropriate to talk of unfair competition and market repartition by illegitimate means.

Such actions have a negative influence not only on the current relations between countries and regions, but also on market configuration in the future: the implementation of important projects is delayed or cancelled, uncertainty increases, and investors quit.

It is expected that the volumes of investments in oil production throughout the world may decrease by US\$150-170 billion in 2015 (estimate: JPMorgan, September 2015). This is a bigger decline than in the crisis year of 2009, when capital investment decreased by US\$57 billion.

This also significantly affects related industries, including science and research, and leads to downsizing. The decline



Family photo of the Heads of Delegations attending the 14th IEF Ministerial in Moscow, May 2014

in volumes of production caused by underinvestment may bring new energy shortages, which could cause an abrupt increase in energy prices and political turbulence.

Possibilities for Stabilisation

The volatility of prices and de-synchronisation of supply and demand in the oil market are to a considerable degree caused by insufficient dialogue and coordination of actions between producing and consuming countries. Under these circumstances, the international community needs to determine the right key points and understand what it can rely on to build mutual confidence.

In the energy industry, there is a need for a new stability based on various mutually beneficial partnerships capable of stabilising the situation and laying the basis for new and efficient investments in the industry.

In this regard, we cannot fail to recall the role of the IEF as one of the key elements in the international 'toolkit' aimed at maintaining efficient dialogue between energy producers and consumers.

Having been a global platform for such a dialogue for over 20 years, the IEF occupies a special position among

international energy organisations, covering better market transparency, overcoming bottlenecks in the development of energy infrastructure and regulatory framework, and creating common approaches to the development of the global energy industry.

The IEF's unique potential is especially needed in the conditions of new global challenges to sustainable energy development, where only constructive and non-politicised interaction between energy-producing, energy-consuming, and energy-transiting countries can ensure a successful response to these challenges.

On May 15-16, 2014 in Moscow, the 14th IEF Ministerial Meeting took place under the theme '*The New Geography of Energy and the Future of Global Energy Security*'.

This 14th IEF Ministerial was another milestone in building the global energy dialogue, and progress in this dialogue is the only possible mechanism for satisfying the interests of all global energy market players in a fair and mutually acceptable way. Thus the role of the IEF must be strengthened, and its potential used for promoting stability in the oil market. ■