

Energy Security in Russia: Problems and Solutions

O.V. Lenkova, I.V. Osinovskaya and N.A. Goryachkina

Tyumen State Oil and Gas University, Melnikaite street, 72/1,
Tyumen region, 625000, Tyumen, Russia

Abstract: Today energy security is a very actual topic not only in Russia but also in the whole world. According to the scientists the world is moving to the global energy crisis, that can be caused of irreparable damage not only to energy, but also to ecology and economy of the whole world. It is caused mainly by the fact that the operation of any industrial and socio-economic systems based on the use of energy resources (oil, gas, etc.), which are irreplaceable and limited. Therefore, energy security has become one of the fundamental principles of long-term and sustainable development of the country. A primary need is the rational using of energy saving technologies, environmental, etc. Improving human well-being on earth should become a priority issue in every country. For its solution, firstly, it is necessary to understand that what is happening now in the world will influence largely on the future of the next generations.

Key words: Energy security % Energy resources % Oil and gas sector % Technologies % Natural fuel resources % Energy efficiency % Innovation potential

INTRODUCTION

Russia nowadays is capable to provide the necessary level of energy security in the coming years thanks to a well-developed fuel-energy complex, however, the problem is that the extraction of energy resources and their conversion into thermal and electrical energy require more investments.

The problem of reduction of resource oil and gas sector is largely connected with that it is often not seen as a resource consumption, but as generating resource. At the same time, the level of resource and energy that is typical for the oil sector and the oil companies in its structure can grow under the influence of various external and internal factors. The results of strategic analyses have shown that the external factors include price factors, connected with the tendency of growth of oil and energy prices. And also increase in demand for energy resources on the international domestic markets will impact on the resource consumption and their prices [1].

Due to that fact in the next 3-5 years we should expect a significant increase in prices and a lack of electricity on the industries, including oil companies, it is necessary to pay close attention to the using of

energy-efficient technologies in their operations. Otherwise, the resource intensity of oil and gas sector will continue to increase. Long-term goals of the oil corporations have to be adjusted in the direction of ensuring resource efficiency and have to include management of energy resources consumed, but not only getting the maximum commercial effect. Development of oil production requires a special strategy of resource consumption, in which efficient using of resources can be achieved through innovation, the implementation of which will require joint efforts, regional governments, oil companies and the development of a mechanism to achieve its goals, including the forms and methods of stimulating the introduction of resource projects [2].

In the field of energy security, there are several other problems associated with the state of energy in the country, namely the lack of new generating capacities. Depreciation in this area is more than 60%. There is high energy consumption. The lack of financial resources allocated for the development of energy-saving and resource-saving technologies [3].

Speaking about the energy security of the country can not be said about the role of industry, academic and high school science in solving the identified problems.

Corresponding Author: Lenkova, Tyumen State Oil and Gas University,
Melnikaite street, 72/1, Tyumen region, 625000, Tyumen, Russia.

The link between increasing of energy security and searching of innovative approaches (technologies) for solving the problems assigned by the state it is necessary strong support of the scientific community and also support from the state of science in this field, scientific research, obtained on alternative sources of energy, fuels, etc. It should be an annual increase in funding by the state researches, conducted by young scientists on energy and resource conservation and also by the part of large companies through the implementation of grant activities.

Another, no less vital problem in the field of energy security is the lack of legal regulation of this issue. It can be noticed that no one of the existing legal act doesn't give a clear understanding of the term of energy security, so it is advisable to use the definition set out in Decree of the Russian Government of 13.11.2009 ¹ 1715-r "On the Energy Strategy of Russia until 2020" (no longer force). Energy security - this is the state of security of the country, its people, society, the state, of the economy from the threats of reliable fuel and energy supply. These threats are defined as external (geopolitical, macroeconomic, market) factors and actually in the state and the operation of the energy sector of the country [4].

To ensure energy security and stable development of the country is the most important condition of creating common policy in the field of energy security, which primarily involves a common understanding of existing problems.

Systematized and presented in Fig. 1 problems are certainly not the whole list of the problems, but in our opinion, these are the main problems, which are the most relevant for today.

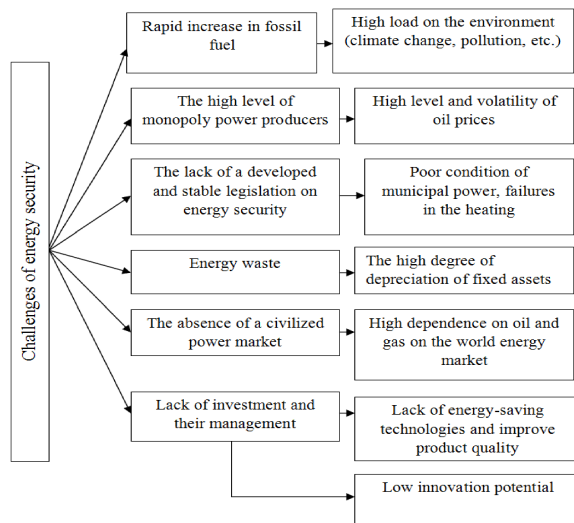


Fig 1: The main problem of energy security

In today's society there is a vital question about energy security, not only for the state but also for the whole world, because energy is a basic component of all sphere of society (production, socio-economic, etc.). The dependence of society on the energy conceals the most important problem. According to research by scientists, the world population is growing every year. Under some projections, by 2020 it could be 10 mlrd.people. Consumption of natural fuel resources is also increasing and more and more predictions say that in a few decades, these resources will become unavailable and very expensive. This is a consequence of unsustainable resource using and low investment potential [5].

Certainly, it can be noted that companies don't always invest the necessary amount of funds for the development of innovative technologies in the field of energy efficiency, energy conservation, environmental safety, etc. Particularly, this fact is the most confusing, as energy resources bring major share of funds to our country, which is considered "rich" in natural resources.

Also, a high level of monopoly power producers plays an important role, precisely in consequence of this factor, energy prices have the unstable and unbalanced character.

Solution of such problems should be a range of activities, in detail covers every aspect of this issue. In Russia, firstly, it should pay attention to the rational and equitable distribution of the energy resource base, the introduction of renewable energy technologies, energy efficiency [6].

These measures in the first place will help to initiate the solution to rapid growth in consumption of mineral resources and consequently will stabilize prices at a reasonable level for the population. Of course, these are certainly temporary measures, since the moment of rising energy prices as a consequence of depletion is inevitable, but this is why the implementation of these measures is a complex way. So, introduction of renewable energy sources in the energy sector of the country, of course, will take much time, it will be a long and laborious process of development and implementation. But time is still enough and even more time may be, if the country will actively address issues of energy conservation and energy efficiency. Achieving these goals will be a crucial factor in improving living standards [7].

Firstly, it is necessary to create special funds of energy efficiency, to increase the level of funding, received from the export of energy and constant monitoring of the using of energy resources, possibly

through the introduction of legislation promotions and penalties, as well as the active implementation of existing energy efficiency programs and the development of new, more effective [7].

Possibly, for solutions to the challenges of energy security of Russia, we also should take an experience and technology of other countries. The international experience shows that the developed countries are mainly exporters of energy [8].

North America and Western Europe actively substitute oil by natural gas, more cheap and environmentally clear energy source. While is also important, the gas has renewable character and its deposits are in many countries of the world.

Another source of energy is the energy, received by biogas, processing agricultural biogas, natural gas, produced from organic waste. This source is very effective. It is used in Germany, the UK and Luxembourg.

Hydropower is quite highly developed energy source and takes one of the leading positions among the energy production in the EU. We can also note a large number of hydropower plants, which are located in Russia.

Using of wind energy, which today is a very promising source of energy for the funding, that is widely used in Denmark, on Cape Whalen, Wrangel Island, the islands Schmidt, etc.

Solar electricity is widespread in Canada, Sweden, Norway, Finland, Alaska. And even in the climatic conditions of our country (daylight hours and other factors), this method can be used in certain investments and completions for heating and electricity production.

Using of geothermal energy is difficult, as the consumer of this energy should be geographically linked to the source. But this does not mean the possibilities and promises of this method in Russia, with the using of hot steam or water, obtained from the ground in remote areas from the central power supply systems.

Energy solid biomass is effectively used by the Netherlands, Belgium, Sweden and Denmark. This source of energy is used not only for heating and electricity production, but also for creating fuel for vehicles.

Biofuel (ethanol and biodiesel) is used in many countries and is quite profitable regulated by partial exemption from certain taxes and fees, as well as in some countries, there are tax incentives for the using of biofuel.

Another source of fuel is coal, actively used in China, South Africa, Germany and the USA. Coal is much cheaper than gas, it determines its potential as an alternative fuel source, as not only oil prices has a tendency to increase, but also, gas, recently, demonstrates ambiguous price increasing.

All of the proposed energy sources have their pros and cons and maybe some of its simply can not be adapted to the conditions of our country, as it will require more investments, than the result in the future, or perhaps, they are already used in Russia.

Do not forget about development of international cooperation for strengthening the position of not only price stability and the development of alternative energy sources, but also in terms of ecology. Since the question of ecology is the base of all the understanding of energy security. The existing level of pollution led to such disastrous consequences, when all countries face the need to take immediate steps to improve the situation. The negative impact of energy on the environment must be closely monitored and controlled by various economic measures, as this problem has become global and has a significant impact on the lives and health of the population of all countries of the world [9].

Possibly solution to the problem of energy security is precisely in the complexity measures, used in the development and implementation of alternative energy sources, renewable energy technologies, legislative measures. And also the fact that Russia's energy security will always be linked with international cooperation in this question. Even despite the fact, that in many countries, energy security is understood in different ways, all countries agree that we need in a stable and reasonable structure for energy security. In this way, it is very important to create a single document to regulate different aspects of energy security in the world, wich will be capable of controlling and combining political, social, economic and other needs of the population of the planet. Necessary to ensure the transparency of information about energy resources, their production, distribution and using throughout the world, as well as to create efficient and competitive global energy markets [9].

The fact that some of irreplaceable energy is the theme of many of the conflicts in the struggle for these resources. This is a consequence of the uneven distribution of energy resources in the world and also represents a danger not only of energy starvation or environmental degradation, but also the possible conflicts, which may lead to worse results. Many poor countries have a lack of access to cheap energy, it has a significant impact on all aspects of life, from health to social and cultural development. To solve this problem, it is necessary to create more efficient implementation of the program of increasing of access to energy, with strong support from the state.

In Russia, management of energy security is in the following areas [10]:

- C Development framework FEC
- C Control over the activities of energy structures
- C Management of Energy Resources
- C Development of norms, standards and regulations in the field of energy security
- C Monitoring the efficiency of power plants
- C Licensing of mineral deposits
- C Supervision and regulation of natural monopolies in the fuel and energy

Certainly, we can say that these measures are effective, but can also be seen that it is possible some of these measures are not performed in full. And to ensure that the policy on energy security would give really good results it should be felt by a comprehensive approach to solving the existing problems and not only at the national level but also at international level, developing international energy cooperation, as well as adopting and adapting the experience of other countries.

Increasing well-being of man on earth should be a priority issue in any country, for which solutions firstly it is necessary to understand that what is happening in the world now, will influence largely on the future of the next generations.

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