THE GLOBAL ENERGY SECURITY

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The global character of the matters of the energy security dictates the necessity of creating a world control system of the energy resource balance in the interests of the whole humanity. The article is devoted just to these problems, allowing to imagine modern panorama and the outlines of the future development of the world energy and to understand the tasks, which the world community faces.

The world community has entered the 21st century paying more and more attention to the solution of global problems of energy security, which predetermine not only the rates of social-economic development, but also the survival of humanity in the future.

Although modern civilization is the result of functioning and interaction of a great number of spheres of social life (industrial and agricultural production, science, information technologies, education and others) it is just the energy that is its basic and at the same time the most vulnerable unit. The consequences of a sudden 'disappearance' of the energy will immediately become apparent and the scale of losses will be catastrophic.

After switching off the light, communication, heating and water supply there will be the end of cities' normal life. Even transport seeming autonomous and independent will cease working, as petrol pumps at gas stations work using the electric motors. Oil in the 20th century became 'the blood' of the world industry and the failures of its supplying have repeatedly led to national and world economic crises.

For the last 40 years the use of the natural fuel resources (oil, gas and coal) has increased 2.5 times and they form almost 90 percent of the world energy balance. There have appeared different forecasts of the development of the world energy after a substantial exhaustion of natural resources. The energy crisis may threaten not only a separate country or a continent, but the whole world civilization. That is why the problems of global energy security become more and more urgent and are widely discussed at international summits of the highest level.

According to the experts of the International Energy Agency (IEA) the energy security is a complex conception whose aim is to prevent the consumers from breaks in energy supply, induced by *force-majeure*, terrorism, or insufficient investment into the infrastructures of the energy markets. Most attention has recently been paid to such key points as the international cooperation, optimal organization of markets and uniform conditions of the consumers' access to the world energy resources.

According to the UN medium forecast scenario the population of the world will increase from 6.2 billion people (at the beginning of the 21st century) to 8 billion by 2030 and to 10 billion by 2050, at the same time 80 percent of the population will live in the developing countries.

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Due to limited natural resources of the Earth and the necessity to provide energy security of the world community, the task of the maximum use of the renewable sources of energy comes to the forefront. Recently there has been achieved a significant scientific and technical progress in the usage of non-traditional energy sources for producing heat and electricity.

Providing Humanity with Energy in the Long-run

Providing the energy security for the world community in the interests of the present and future generations is the indispensable condition of the development of the world energy.

Energy rationalism is the main constituent of the development of the humanity in the 21st century. By means of the energy saving in the middle of the century it is forecast to save 6 billion tones of standard coal, that is equivalent to the present oil and gas production, and by 2100 – 18 billion of standard coal, *i.e.* more than the whole world energy balance – 14 billion tons of standard coal. Energy saving will allow to save a considerable amount of natural resources for future generations.

Within the period of 2050–2100 the multiple growth of the coal and atomic branches will continue, and also the significance of renewable sources of energy will increase. The energy production using oil and gas will remain at the level of 2050. New discoveries especially in nuclear physics will lead to the huge changes in energy, but their potential is impossible to estimate even theoretically. Taking into consideration more and more complicated scientific and technical problems, appearing while constructing reactors of new generations many decades will be required for their industrial application.

The main elements of the global energy security are the following:

The diversification of the energy sources, *i.e.* the economy must not excessively depend on a single energy supporter, the monostructure of the energy balance is inadmissible.

The ecological acceptability, *i.e.* the development of the energy production must not be accompanied by the increase in its negative influence on the environment.

The rational use of the traditional hydrocarbon resources, *i.e.* the use of organic fuel in the energy must not lead to its lack for chemical industry.

The transition from the simple delivery of the stuff to the international collaboration in the sphere of processing of energy resources, exchange with the latest technologies, broad coordination in the investment sphere, the development of the advanced standards of energy saving.

High tempos of the developing of the renewable energy sources allow to decrease the dependence of the world economy on oil and gas supply and to minimize the costs of transporting the energy resources.

The intensification of the international scientific research in all branches of energy production. The ensuring of the energy security of the world community can be only achieved through taking into consideration of the long-run guiding lines and forecasts and must be based on the results of the global monitoring of the energy resources of the planet and their use.

The further integration of states while solving scientific and technical tasks will contribute to successful introduction of innovation technologies. In many spheres of the energy there will be required the development and realization of large-scale inter-

national programs comparable with the ones applied to the field of space exploration, or construction of thermonuclear reactors.

At the beginning of the 21st century the world common energetic space has been formed – the pledge of the energy security of the humanity. For more dynamics of this process in the nearest future it is necessary to develop a methodological, normative-legal and organizational basis of the world energy management. The main task of the second period (2015–2030) is to begin the realization of the projects within the framework of the united international program of the control of the fuel-energy complex.

At the third stage on the basis of the long-term public-state programs the system 'Energy – Economy – Nature – Society' must be developed whose basis will be formed by the 'green' energy. The similar global program of the 21st century may be created under the aegis of the UN with the broad participation of the representatives of the states, business, competent scholars and public organizations.

In the 21st century oil, gas, and coal will remain the basic sources of the world energy. The high effectiveness of these energy sources is of much significance for the steady development of the humanity. At the same time the strategy of the development of the world energy must take into account the prospects of using ecologically friendly energy sources and modern technologies of their development which will allow guaranteeing the energy security of our civilization. The world community must perform the great scientific-technical breakthrough in getting access to the energy of the Earth interior, ocean, sun, cosmos and atom. Only then we will be able to satisfy the growing demand for the clean, abundant, reliable and safe energy – the basis of the high living standard, developed economy and culture of the world and national security. We have to multiply this source of vital force and to pass it to the reliable hands of our offspring.