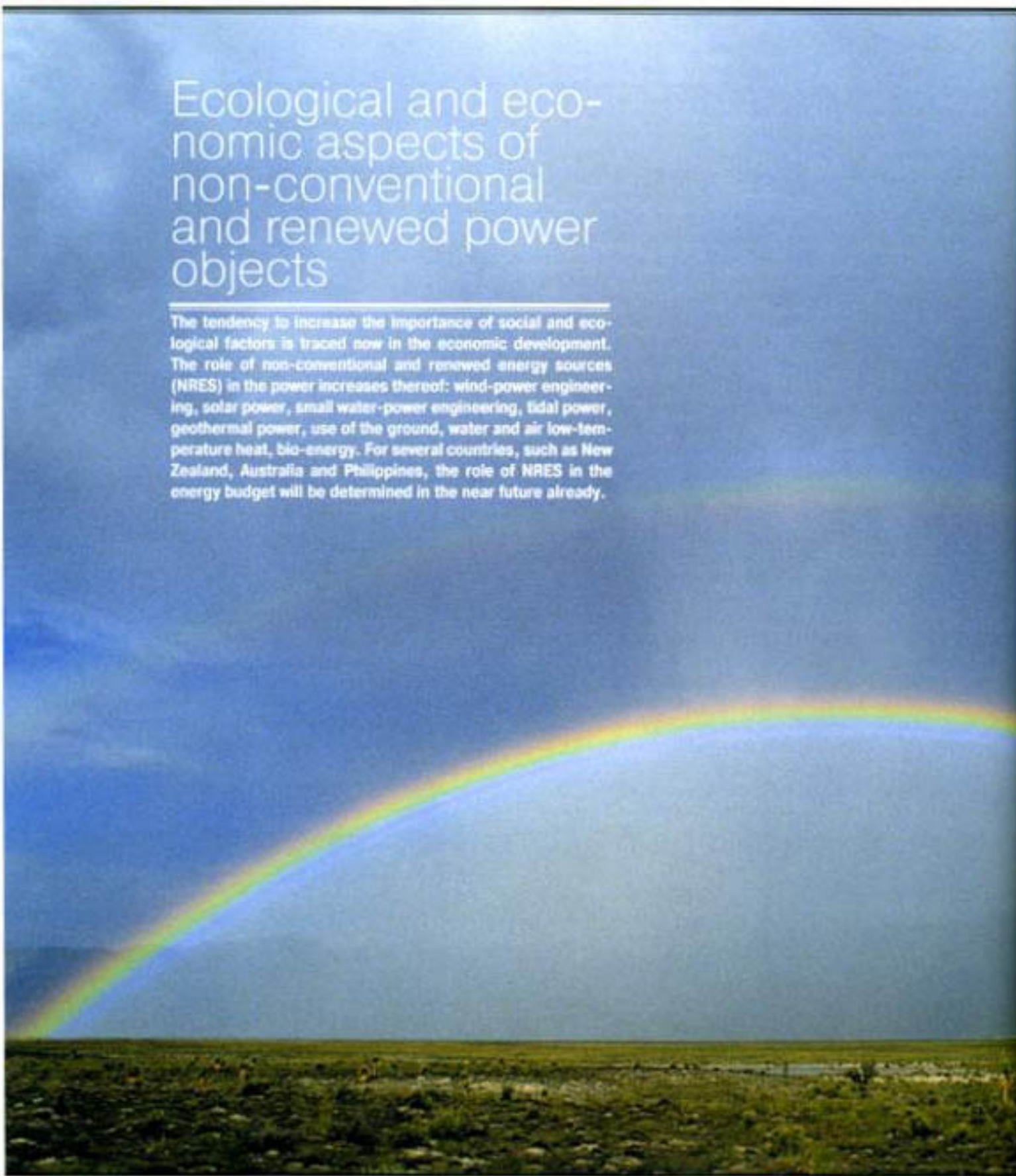


Ecological and economic aspects of non-conventional and renewed power objects

The tendency to increase the importance of social and ecological factors is traced now in the economic development. The role of non-conventional and renewed energy sources (NRES) in the power increases thereof: wind-power engineering, solar power, small water-power engineering, tidal power, geothermal power, use of the ground, water and air low-temperature heat, bio-energy. For several countries, such as New Zealand, Australia and Philippines, the role of NRES in the energy budget will be determined in the near future already.





Russia has abundant supplies of natural fuel and energy resources (FER) and, is the unique country in the world, which is not only completely provided with own FER, but also exports a significant amount of petroleum, gas, coal and electric power to the other countries. But it does not mean that the country has no power problems:

- contradiction between the accommodation of the main productive forces in the European part, and the basic fuel bases in the East areas that leads to continuous increase in fuel traffic in the western direction;

- increase of cost of FER extraction because of moving new fuel bases to the north-eastern areas of the country in connection with the degradation of climatic conditions in the areas of new fuel deposits developing;

- contradiction between the volumes of industrial stocks and volumes of extraction of various kinds of fuel, i.e. petroleum and gas, which are more limited on stocks are more intensively extracted;

- continuous degradation of the extracted coal energy value and quality;

- environmental pollution growth.

Environmental problems become aggravated in the process of increasing in scales of energy consumption and in connection with increase in the share of the low-grade fuel in the energy budget of the country.

A wide-scale work is carried out for maintenance of ecological safety and appropriate rates of economic development in our country, the purpose of which is if not to eliminate then to soften the action of specified above negative factors. Undoubtedly, a great attention needs to be paid to the non-conventional renewed energy sources (NRES).

Russia has significant resources for development of non-conventional renewed power (NRP) and the use of NRP increases every year in the energy budget of Russia. The main problems of the power branch of Russia are the mineral fuel cost growth, imperfection of the price, tax and financial policies of the state that creates significant difficulties for the functioning of the power enterprises, complicates the task of new investments attraction in the power. The deterioration of the equipment on power stations of the country, the necessity of reconstruction of the nuclear power station for their compliance with modern

safety requirements endanger the normal power supply of consumers. Considering difficulties in attraction of investments into the construction of large power objects and increase of the importance of the social and ecological factors, the use of NRES in the energy budget of Russia will be one of the main directions for the nearest years.

The environmental safety of NRES, their inexhaustible supply, huge potential resources, preservation of the heat balance of the planet irrespective of the scales of useful use - make the NRES development economically and ecologically favourable and tempting.

Many developed countries of the world (the USA, Japan, the Great Britain, France, etc.) have worked out the long-term national programs on NRES developing. Similar works are also carried out in our country.

A computer program «Financial and economic substantiation of non-conventional power objects» is developed in the Laboratory of wildlife management market tools at the Institute of market problems of the Russian Academy of Sciences.

This program is based on the normative documents in effect now in the Russian Federation and can be used at various stages of the investment process:

- at the stage of investments substantiation development;
- at the stage of the design documentation development;
- at the stage of business-plan development.

The program consists of four basic parts:

- 1) Initial data for computation.
- 2) Determination of capital investments in construction.
- 3) Annual costs for operation.
- 4) Computation of the capital investments efficiency.

Based the data obtained when working with the program, it is possible to state that the non-conventional renewed power objects in some cases are now quite competitive in comparison with the traditional energy sources, and it is necessary to consider the possibility of the NRES use when designing the supply systems.

Really, till recent time, the cost indices of the installations based on the use of renewed energy sources, remained high enough. However, within the last years, the tendency was traced in approachment of the specific capital investments and the cost price of the electric power for the non-conventional and traditional power objects. It is caused on the one hand by increase in prices on fuel in traditional power, and on the other hand by perfection of the design and improvement of the technical and economic parameters of non-conventional renewed power installations as a result of carried out in many countries of the world (including in Russia) the research and experimental development works on these subjects.

The program of the economic efficiency evaluation shows that many NRP objects are profitable enough and will draw the attention of investors, and as the technical schemes of the installations are perfected, NRES would be involved in the energy budget of Russia for solving power problems and increasing the ecological and economic safety of the regions in a greater degree.

The use of non-conventional power is especially effective in the areas remote from the centralized power supply, where the expensive imported fuel is used now for the power supply.

Let's consider for example, the possibility of application of one of NRES - wind power - on the example of the Altay territory.

Today, the population of Altay territory collides with a number of economic and sociopolitical problems:

- deficiency of the electric power (Altay territory receives more than 50 % of the electric power from the outside);
- reduction of the competitiveness of agricultural and industrial output made in the territory as a result of sharp jumps in the electric power cost;
- weak installed power per employee of some agricultural areas due to dearness of construction or impossibility of





the lining of electric mains, make the economic activities economically unprofitable;

steppe areas have collided with the threat of desertification which is now one of the global problems of the civilization.

These problems put the economic and ecological condition of Altay territory in a crisis position. The farms of various modes located in the steppe zone cannot stably keep house, as cattle breeding is impossible without a steady forage reserve based on irrigation. The problem of employment is also connected with the stability of cattle breeding in the territory.

It is possible to solve problems of the territory by means of NRES introduction in power. The most expedient is to use the wind power, as the wind conditions of the territory allow to use windmills, which are rather cheap, simple in manufacturing, installation and operation, economic, pollution-free and independent energy source.

The main task of windmills is to supply the necessary amount of energy for water-bearing chinks, collectors, pump stations and irrigation machines. The increase of the installed power per employee of Altay territory will allow to:

lower the power dependence of the territory;

lower the expenses for purchase of the electric power; keep the area of the irrigated grounds that will prevent desertification of the grounds and will improve their fertility;

stabilize the number of population borrowed in cattle breeding and land improvement, to increase the quantity of workplaces and the livestock of cattle;

raise installed power per employee of the agricultural production that will allow to increase the efficiency of farmer work, efficiency of farms and competitiveness of the agricultural production made by farmers;

improve the general economic and ecological condition of the territory.

Taking into account the difficulties in attraction of investments into construction of large power objects and increase of the importance of social and ecological factors in the economic development, it is possible to consider the use of NRES in the energy budget of Russia as one of the perspective directions for the nearest years.

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