

THE TRANSFORMATIVE IMPACT OF EXPERIENCING INTERNATIONAL ENERGY-SAVING STRATEGIES AND THEIR POTENTIAL APPLICATIONS

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Abstract. *In this article, the experiences of foreign countries on energy saving, which are relevant today, were considered. Acquaintance with the experience of implementing energy conservation policies in developed countries. The reasons for using steam-gas technologies are explained.*

Key words: *Solar energy, wind energy, fuel and energy resources, gas plant, thermal power plants, gas turbines, oil products.*

Introduction.

After the energy crisis of the 1970 s, western countries created an energy conservation program that included legal and economic incentives to implement large energy conservation measures, and in which they focused on fuel (mainly oil and petroleum products) and energy economy. they introduced the necessary financial and mineral resources. As a result of the implementation of the energy saving complex, the economy of the Western countries and the USA is flourishing, with a priority and reliable supply of oil and oil products.

The experience of implementing energy conservation policies in developed countries shows that there are three main directions of energy conservation. The first effective, low-cost direction for the initial stage of the implementation of the energy saving policy is the rationalization of fuel and energy use. Economic costs are impractical, the main pressure, along with the creation of economic foundations, an

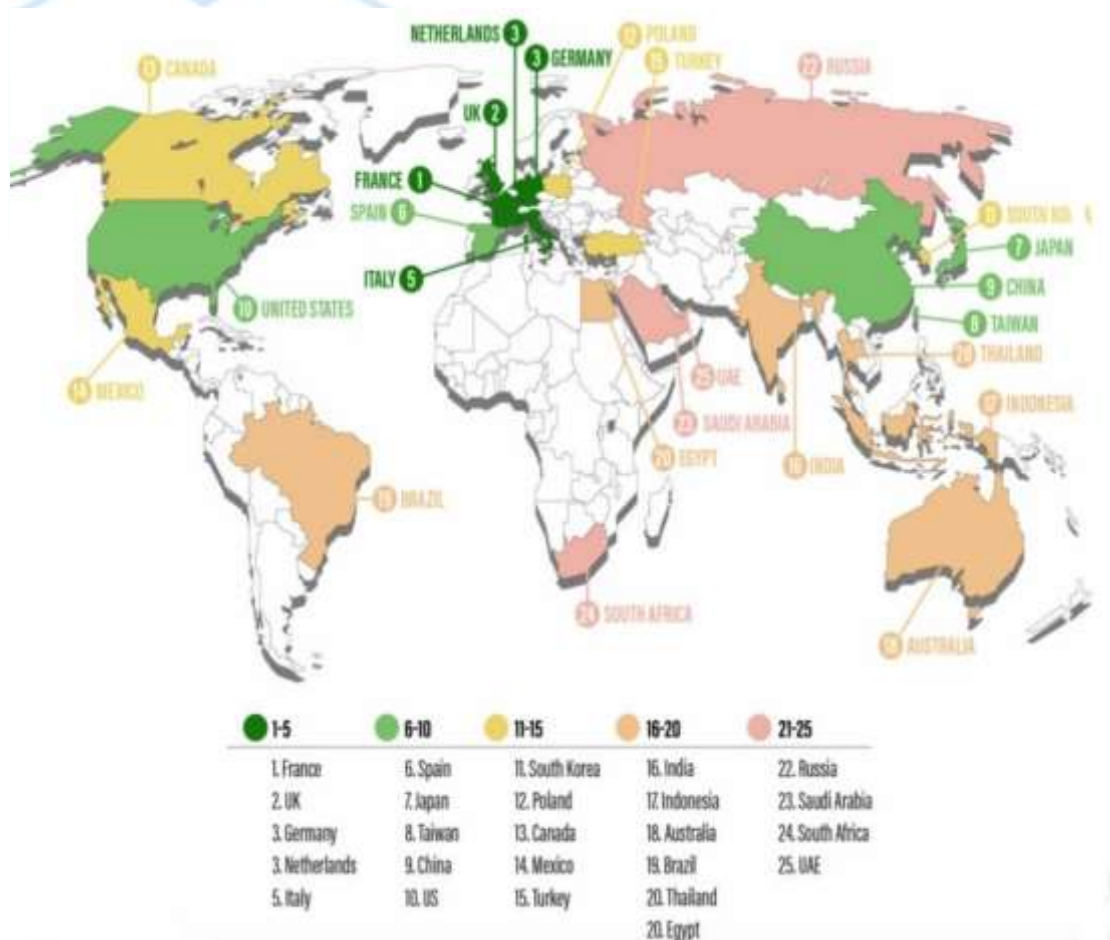
organizational measure is implemented, in which YOER producers and consumers are mobilized to save energy. [1].

The analysis of foreign experience shows that 50 to 70% of the implemented energy saving potential is primarily due to organizational measures. First of all, it consists in stopping the release of non-competitive products, eliminating expenses in industry, agriculture and household utilities. Due to the implementation of this direction, the demand for fuel and energy can be reduced by 12-15%. The second direction of structural restructuring of the economy is related to changing the speed of development of energy-intensive and less energy-intensive sectors. For example, the energy capacity of light industry, service sector, and construction is 8-10 times less than that of the fuel and energy sector, and 12-15 times less than that of metallurgy. The reserve for reducing the demand for fuel and energy resources due to structural changes in the economy can be 10-12% of the current consumption. The third direction is the implementation of energy-saving technologies, including the use of renewable resources (solar, water and wind energy), processes, tools and equipment in the most energy-intensive areas. In addition, energy-saving technologies are environmentally friendly and do not require additional costs for solving social problems.

Another important trend in the world electricity industry, which leads to energy savings, is the ubiquitous implementation of steam-gas plant (SGW) and heating, under this concept thermal power plants (thermal power centers - IEM) together produce 15% of heat and electricity. release lies. Heating is the most rational way of using fuel resources [2]. Recently, co-generation (three generations) of electricity, heat and cooling is spreading in the world, which increases the efficient use of fuel.

The use of steam-gas technologies is explained by the following reasons: compared to steam turbine devices, the economy of thermal power plants increases significantly: that is, FIC increases from approximately 33% to 55% and more, the release of carbon dioxide gas and other toxic substances decreases; and maneuverability increases. Currently, BGQ aggregates with a unit capacity of up to 500 MW are being used.

For example, in Germany and Denmark, 50% of electricity is produced as a result of fuel consumption. The share of electricity production in IEM with the help of European Union countries increased from 9% in 2000 to 18% in 2014. [3].



The 2022 international energy efficiency scorecard.

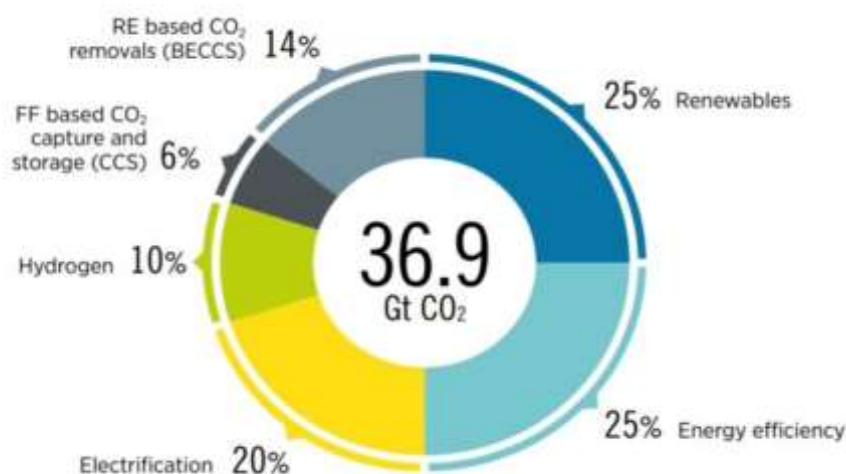
Picture-1. All of the foreign countries energy saving scorecard

As a result of the implementation of the energy conservation complex, the economy of the Western countries and the USA is flourishing, with a priority and reliable supply of oil and oil products. For example, in this century oil consumption increased to 65 thousand tons in the USA, 20 thousand tons in England, 21 thousand tons in the GFR, and 30 thousand tons in France. reduced to conventional fuel. During this period, the economy of the USA and Western European countries developed

without increasing the consumption of energy resources. The experience of implementing energy conservation policies in developed countries shows that there are three main directions of energy conservation. [4].

The experience of developed countries shows that with the increasing use of gas turbines in the energy industry, it is necessary to design boilers with a heat capacity of 50 G cal/hour or more to transfer the heat of the exhaust gases from GTQ devices to the mode of operation of small GTQ - IEM in which full use is made. is appropriate. In this mode, the fuel (natural gas) utilization rate reaches 80-90%, which is much higher than that of ordinary IEMs. The analysis of energy saving measures mentioned above in developed countries shows that they have two time phases. At the initial stage (intended for 3-5 years), measures for temporary economy of energy resources, rational use, which require large expenses, will be implemented.

It consists of organizational measures (planned and legal) to improve accounting and control tools, increasing the responsibility of consumers and producers in the use of energy. In the second stage, the main measures of the energy saving policy are the mass implementation of new energy saving technologies, at the same time, the replacement of outdated equipment, the reconstruction of production in motion, the reduction of product material capacity, and the relatively low energy capacity. It consists of changes in the structure of the industry economy in order to use absorbent materials, rationalize transport schemes, increase the level of thermal insulation of existing buildings, and reduce the relative energy capacity. At this stage, measures are taken to save gas fuel by replacing liquid fuel and using solid fuel, as well as renewable energy resources. In addition to the importance of the first stage of the implementation of the energy saving policy for the national economy, it should be noted that the second stage is the main direction of energy efficiency improvement.



Picture-2. Energy Efficiency Worldwide

In developed market economy countries, the implementation of energy saving policy was carried out by adopting large economic and legal measures. Taking this into account, in order to ensure the effectiveness of the energy saving policy, it is necessary to provide a legal and economic incentive mechanism for all energy resource consumers and suppliers. The main focus should be on finding material resources. [5].

Tariff formation and financing issues are very important when carrying out energy saving activities. In order to encourage consumers to save energy, it is necessary to gradually implement the policy of energy-saving tariffs. Basically, such differentiation is the rate of time (to adjust the electricity and heat load during the night, week, year), energy consumption by volume (to keep it from exceeding the standard consumption) and the volume of energy saving. (to reward the implementation of energy-saving measures) is necessary.

In addition, these are tariff credits, i.e., temporary tariff reductions for energy-saving consumers. Tariff credit appears in one of the following forms: non-refundable (the inability of TEK enterprises to cover costs, especially for budget organizations), interest-free (with repayment of the loan funds after an agreed time) or interest-bearing (the same, but with a percentage) credit.

Energy is a traditional financial source of saving, and enterprises' own funds serve. An important source of energy savings should be loans from investors. Another source of investment is energy savings funds created from the profits of energy generating enterprises, power plants, and subscriber fees and other sources. Energy saving funds serve as a guarantee for attracting funds to important projects in a number of cases. The effectiveness of such funds is very high, so it is necessary to use the experience of foreign countries. Successful implementation of an energy conservation program depends on planning and organizing the program to get the most out of the money spent on energy conservation activities. First of all, it concerns the choice of priorities for saving energy resources in enterprises.

It is necessary to know that the direction related to the investment of energy saving has some costs, in particular, long periods of mastering and implementation of new equipment and technologies, technological processes for the purchase and installation of new equipment. expenses associated with the need to allocate large funds for reconstruction. In many cases, the payback period for investments is too long, so energy-efficient measures are rejected.

Organizational-economical and mode-using activities are attractive because many of them are implemented without capital expenditure or with very little expenditure, with immediate effect. In the enterprise, it is possible to apply small energy saving measures that pay for themselves in a few months.

Foreign companies (USA, England, Scandinavian countries) select energy-saving measures according to their effectiveness and first of all include them in the operating and organization plans of the regime with a payback period of less than one year. After that, activities of a technical nature, with a payback period of one to three years, and finally, activities related to the implementation of new technologies and new equipment, which require large capital expenditures, are included. [6].



Picture.3. 2022 year International Energy Efficiency Scorecard

Results and discussion

Thus, before planning the implementation of energy-saving measures with capital capacity, using reserves of fuel and energy consumption by improving the organization of production: that is, improving the technical condition of equipment, their energy modes, low coefficient of loading of energy resources equipment elimination of losses related to, etc. On the other hand, the potential benefits of using new technology and equipment may not be fully realized. Without a deep analysis of the interdependence of production processes, technology and energy, it is impossible to use the reserves of energy resource economy in working enterprises. This issue is usually addressed by conducting an energy audit, a periodic, thorough review of audit equipment, technological processes, and as a result of this review, the cost of energy consumption, irrational costs and energy consumption in certain processes and certain devices. is carried out by determining direct losses. The nature of the energy saving

measures used abroad is that the execution of a complex of works there is of a permanent nature. This will ensure the continuity of work on improving energy use.

In order to create an effective energy saving management system in enterprises, it is necessary to divide the energy audit into external (independent) and internal. The main issue of the external audit is to assess the level of organization of work on energy saving in enterprises: the existence of periodically developed plans for energy and fuel economy, the effectiveness of these plans, the state of accounting and control of the consumption of energy resources, the normalization of the consumption of energy resources.

Internal energy audit serves as a tool for determining reserves of saving energy resources in enterprises. Enterprises independently establish the terms of internal energy audit and object inspection, development of energy consumption rationalization plans based on actual practice. Another bright direction of the energy audit is the comprehensive transfer taking into account the optimal energy balance and the future development of the power supply scheme of the object under investigation. In this case, optimization of expenditure on energy resources is carried out, the cost of expenditure on fuel and energy supply of this subject is determined.

Conclusion.

Thus, energy saving abroad is solved in a collective way, using the levers of legal pressure on electricity producers and consumers, creating it and using measures of economic stimulation. In order to encourage consumers to save energy, it is necessary to gradually implement the policy of energy-saving tariffs. Basically, such differentiation leads to energy saving by time (to adjust the electricity and heat load during the night, week, year), by volume of energy consumption (to keep it from exceeding the standard consumption).

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