ANALYSIS OF FACTORS AFFECTING THE EFFICIENCY OF RENEWABLE ENERGY SOURCES

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It is known that efficiency is the achievement of a specific result at the lowest cost or the maximum possible output from a given amount of resources.

Economic efficiency is the high profitability of economic entities achieved as a result of economic activity, that is, it is expressed by obtaining high income (profit) by spending the least amount of resources or costs.

In other words, it is characterized by the ratio of the obtained economic effect to the consumption of production factors and resources, which led to the achievement of the highest production volume using resources of a certain value.

Economic efficiency is expressed as an economic indicator that reflects the profitability or profitability obtained in relation to the unit of resources and costs spent on production.

$$E_i^t = \frac{R_i^t}{C_i^t}$$

Here, E_i^t – economic efficiency (profitability) of i-network at time t, R_i^t – the income of network i at time t, C_i^t – resources and costs of network i at time t.

Of course, factors affecting the economic efficiency of economic entities can be divided into two groups. In particular, qualitative indicators include: competition, innovative ideas, effective management, personnel competence, scientific developments, and quantitative indicators: fixed assets, labor resources, capital investments, resource costs, storage and transportation costs, etc. (Figure 1).

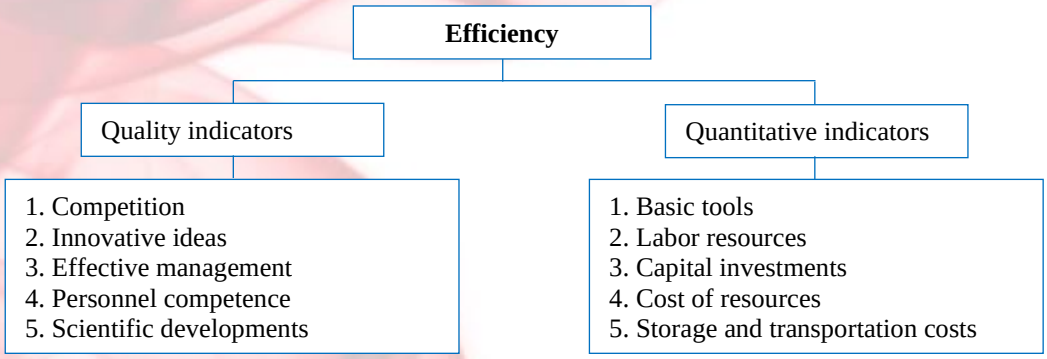

Figure 1. Grouping of factors affecting efficiency[1]

[1] Compiled by the author.

Quantitative indicators are often used in the study, analysis and evaluation of economic efficiency. Because quantitative indicators reflect the quantitative aspects of the studied process and are expressed in specific measurement units. This makes it possible to evaluate the quantitative relationship between the resulting and factor indicators on the basis of econometric models.

This, in turn, shows the economic potential of the studied economic object. That is, the economic potential depends on all the factors affecting it and participating in the process of production and sale[2].

In other words, the economic potential of the production process depends on the company's resources and their ability to transform into the necessary results to achieve specific goals in the production process[3].

In general, it can be seen that different methods and criteria are used in the economic literature and industry studies to assess economic potential. In particular, E.V. Nikolskaya[4] believes that the potential of each resource is related to other resources in the production system. He emphasized that the acceleration of production should reduce the material consumption of individual types of production units and increase the contribution of resources that help to increase its efficiency by organizing production accordingly.

Accordingly, the economic potential assessment criteria are divided into production components, material resources, personnel composition, technical and technological components, and information resources. The structure of economic potential does not only include elements describing the financial and investment capabilities of the enterprise, but also depends on other factors participating in its production chain, as well as on management decisions.

Based on the above, the following can be cited as quantitative indicators affecting the efficiency of the use of renewable energy sources. In particular, renewable energy producing (converting) technologies, labor resources operating in the field, investments made to finance the field, and others are included. However, the main qualitative indicator affecting the efficiency of the use of renewable energy sources is the sustainability of existing natural renewable energy sources, and the main quantitative indicator is the renewable energy generating (converting) technologies (Figure 2).

Today, in most countries, in order to study, analyze, and econometric modeling the processes of increasing the efficiency of the use of renewable energy sources, first of all, it is necessary to observe, collect, process, group and summarize statistical indicators of renewable energy sources.

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[2] Rodionova L.N. Industrial potential: concept, criteria, structure / Sat. Proceedings of UGNTU, 2001. - p. 103-106.

3 Bartova E.V., Aferova T.V. Analysis of the impact of production potential on the efficiency of industrial enterprises // Russian Journal of Entrepreneurship. No. 13 / 2012. - 2 p.

4 Nikolskaya E.V. Analysis and diagnostics of financial and economic activities of printing companies. Textbook. - M.: MGUP publishing house. 2002. - 351 p.

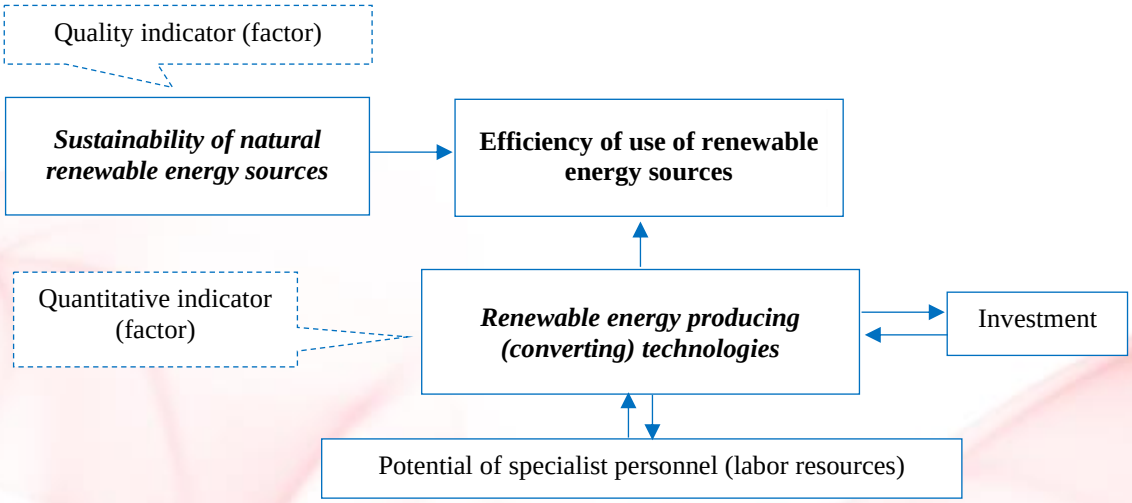

Figure 2. A model that determines the efficiency of using renewable energy sources[5]

In our opinion, the following factors influence the use and further development of renewable energy sources:

Trust is the extent to which community members trust the developer of a renewable energy project.

The factor of distributive justice is the level of distributive justice. Distributive justice means that the costs and benefits of the project are distributed equally among the members of society. For example, if a proposed renewable energy project has the potential to generate income, and community members can also generate income, they may have a positive attitude toward the project. If one of the benefits is the provision of new jobs and previously unemployed team members can find employment, the chances of acceptance are also higher.

The location factor is the location of the infrastructure. The location includes a site selected for renewable energy generation technology. Sometimes community members do not like a proposed location, for example if it is culturally significant or technologically unsafe. If local residents have such concerns, they are less likely to accept the proposed project.

Factor of socio-demographic factors - such factors include age, gender, education and economic status of team members.

In the international experiments, the development and popularization of renewable energy sources, first of all, the adoption of it by the society, which has learned to use traditional energy resources, has been shown as the main direction of the issue.

Of course, many measures to overcome such problems have been tried in practice. The most effective of these are energy subsidies.

Energy subsidies are government measures that artificially lower the price of energy paid by consumers, increase the price charged by producers, or reduce the cost of production.

[5] Author development.

Subsidies for renewable energy technologies are important because they can bring long-term economic and environmental benefits not only for the consumer, but also for the state or society (the world). However, when they focus on fossil fuels, the costs usually outweigh the benefits. Fossil fuel subsidies encourage waste, exacerbate energy price volatility by obfuscating market signals, encourage fuel counterfeiting and smuggling, and undermine the competitiveness of renewables and other low-emission energy technologies.

When developing measures to solve problems related to the use of renewable energy sources and increase the efficiency of this process, it is appropriate to take into account the following:

- to strengthen incentives for the import of technologies that produce renewable energy and for the population and enterprises that have installed them;
- to accelerate the construction of micro hydroelectric power plants in the water basins with existing capabilities throughout the republic;
- it is necessary to strengthen the practice of allocating compensations and subsidies in order to popularize the process of using alternative energy sources and provide additional support to the population and enterprises.

In conclusion, the following can be cited as quantitative indicators affecting the efficiency of using renewable energy sources. In particular, renewable energy producing (converting) technologies, labor resources operating in the field, investments made to finance the field, and others are included. However, the main qualitative indicator affecting the efficiency of the use of renewable energy sources is the stability of existing natural renewable energy sources, and the main quantitative indicator is the renewable energy generating (converting) technologies.