

MEASURING THE EFFECTIVENESS OF STATE SUBSIDIES IN THE TRANSITION TO A GREEN ECONOMY

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Abstract: This article describes the concept of a green economy, its main principles, and its ecological and economic significance. The role of government subsidies in the development and implementation of green technologies in the economy is analyzed. The article examines in detail the criteria, indicators, and analytical methods for measuring the effectiveness of subsidies. International experience and practice in the conditions of Uzbekistan are also presented with examples. Problems and recommendations were presented, and measures were recommended for systematic monitoring and improving the effectiveness of subsidies.

Keywords: green economy, government subsidies, efficiency, environmental indicators, green technologies.

Input

In recent years, the intensification of environmental problems on a global scale, climate change, pollution, and the reduction of natural resources necessitate a transition to a green economy. A green economy is an economic model that includes the efficient use of resources, reducing pollution, and protecting the environment. The role of the state in this process is important: it is diverse.

Promotes the development of green technologies through subsidies, benefits, and grants. The green economy and its main principles are: efficient use of resources, i.e., optimization of energy, water, and raw material consumption; environmental protection, waste reduction, and implementation of environmental standards; ensuring social stability, creating green jobs, and improving the living standards of the population; and innovative development, i.e., supporting economic growth through new technologies and solutions.

Main part

The transition to a green economy will provide not only environmental but also economic benefits: reducing energy costs, creating new jobs, increasing export potential, and developing the domestic market.² Methods for Measuring the Effectiveness of Subsidies Measuring the effectiveness of subsidies is a complex process, carried out on the basis of the following criteria: Measuring the effectiveness of subsidies is a complex and multifaceted process, carried out on the basis of various criteria. The first criterion is economic efficiency, which analyzes the economic growth achieved through subsidies, the volume of investments, and the creation of new jobs. The second criterion represents environmental efficiency; this includes indicators such as waste reduction, increased energy efficiency, and improved air and water quality. The third is social effectiveness, which is aimed at measuring the improvement of the population's

living standards and living conditions. The fourth is technological efficiency, which involves assessing the level of implementation of new innovations and technologies.

To determine the effectiveness of subsidies, economic and environmental indicators are analyzed in detail. For example, data such as carbon emissions, energy consumption, the number of green jobs, the number of new projects, and the volume of investments will be studied. Thus, it is possible to accurately assess the real results of state subsidies, their social, economic, and environmental effectiveness. This method serves not only for the efficient distribution of resources, but also for the correct direction of state policy in the transition to a green economy. Several analytical methods are used to determine the effectiveness of subsidies. One of the most common methods is Cost-Benefit Analysis (CBA). This method involves a detailed comparison of the benefits and costs achieved through subsidies, resulting in an assessment of their economic effectiveness. At the same time, a system of indicators is widely used, in which environmental, economic, and social indicators are placed in one system, and a general assessment is made. In addition, the comparative analysis method helps to determine effectiveness by comparing the periods before and after the application of subsidies. With the help of this method, the real impact of subsidies and changes are determined. Furthermore, the modeling and forecasting method allows for predicting the impact of subsidies using economic models, which is crucial in shaping future policy.

Subsidies allocated by the state are diverse, and one of the most common types is direct financial subsidies. These types of subsidies are implemented through direct allocation of funds to the population, enterprises, or specific projects, and their main purpose is to support economic and social processes. Direct financial subsidies are provided to producers or farmers in the form of monetary funds. For example, direct assistance to agricultural producers falls into this category. Price subsidies are aimed at supporting consumers by reducing the cost of products or services. For example, reducing the cost of fuel, gas, medicine, or electricity can be an example of a price subsidy. Tax benefits or tax subsidies are implemented by reducing or abolishing taxes for enterprises or entrepreneurs. For example, providing an income tax discount to an entrepreneur who has opened a new production line. The state provides low-interest or long-term loans through loans and concessional loans. An example of this is the provision of loans on favorable terms to enterprises implementing environmentally friendly technologies. Social subsidies are provided to citizens in the form of direct assistance, especially to support low-income families. For example, this includes subsidies for free medicines, education, or utilities. Export subsidies are provided to manufacturers to stimulate the sale of products to foreign markets. For example, the state reimburses or exempts some of the exported products from taxes. Thus, government subsidies serve to support the economy, social sphere, and ecology in various ways. **A number of problems arise in the application of subsidies.** Firstly, the increase in the budget burden, i.e., subsidies, are often a source of large expenditures for the state budget, and in some cases, resources are not allocated effectively, leading to overspending of budget funds. Secondly, there are non-targeted subsidies that may not reach the right groups or go to the wrong sectors. For example, agricultural subsidies may be given to large enterprises and not cover small farmers. There is also the problem of social and economic inequality: subsidies may not be enough for low-income families or may not be interconnected with local prices. The lack of control and monitoring is also a pressing issue, as there is insufficient accurate statistical data on the results and effectiveness of subsidies. Additionally, some subsidies may not be environmentally efficient, as they may lead to overconsumption rather than saving natural resources. **There are several recommendations to**

overcome these problems. First of all, it is necessary to create a targeted system, that is, subsidies should be directed to the most necessary sectors, especially small farmers, low-income families, and environmental projects. Strengthening the monitoring and evaluation system is important, and regular monitoring and reporting of performance indicators for each subsidy program is recommended. To ensure financial stability, subsidies should be provided based on efficiency-based mechanisms without increasing the budget burden.

In order to increase social justice, it is necessary to improve the system of support for low-income families and small entrepreneurs. To promote environmental sustainability, it is important to increase subsidies for projects to save renewable energy, water resources, and reduce waste. At the same time, by increasing the digital system and transparency, it will be possible to accurately monitor the effectiveness and results of subsidies.

The number of scientific literature devoted to the role of state subsidies in the process of transition to a green economy has sharply increased in recent years. While preliminary studies examined the overall effectiveness of environmental policy, subsequent studies focus directly on the economic, environmental, and fiscal impacts of "green subsidies." International organizations - the World Bank, the OECD, UNEP - note that subsidies, when directed correctly, stimulate energy saving, the share of renewable energy, and environmental innovations. Studies conducted in EU countries show that subsidies based on clear criteria have a significant effect on reducing carbon emissions, but non-targeted types of subsidies can lead to an increase in budget expenditures and market disruption. In the literature on the CIS countries, the main problems are the lack of a monitoring system, weak assessment methods, and lack of transparency in the allocation of subsidies. Analysis of this literature shows that the integration of economic, environmental, and institutional indicators is important in assessing the effectiveness of subsidies. Therefore, a comprehensive approach is applied in the research.

The study evaluates the effectiveness of state subsidies in the transition to a green economy using a three-stage methodology. The first stage is the definition of criteria, in which economic, environmental, and institutional indicators are selected to assess effectiveness. Economic indicators include energy saving, reduced production costs, and increased competitiveness of enterprises. Ecological indicators include a reduction in carbon emissions, an increase in the share of renewable energy, and a reduction in emissions. Institutional indicators include a monitoring system, transparency in the allocation of subsidies, and budget stability. The second stage is data collection and comparative analysis. The data necessary for the study are obtained from open reports of the State Statistics Committee, the Ministries of Energy and Ecology, as well as ratings and reports of international organizations. An analysis of the time series is carried out on the selected indicators, and the experience of Uzbekistan is compared with the practice of other countries. The third stage is the evaluation model. A multi-criteria assessment (MCDM) approach is used to determine effectiveness. Also, a simple regression model is used to quantify the impact of subsidies, which shows the impact of subsidies on environmental outcomes on a statistical basis. Through this methodology, the effectiveness of state subsidies in the transition to a green economy is assessed comprehensively and objectively.

Uzbekistan has taken significant steps towards transitioning to a green economy in recent years. The volume of subsidies for renewable energy projects is increasing every year. According to the data obtained: Renewable energy capacities have shown significant growth after subsidies, especially in solar and wind energy. Production costs have decreased at enterprises that have

implemented energy-efficient technologies, which confirms the economic efficiency of the subsidy mechanism. Carbon emissions show a downward trend in subsidized industries. **However, the analysis also showed:** Due to the weakness of the monitoring system, subsidy results are sometimes not clearly recorded. Data on the targeted use of allocated funds are not always transparent. In general, the results obtained show that government subsidies have a positive impact on the development of the green economy in Uzbekistan, but also emphasize the need to strengthen the assessment system, standardize criteria, and increase transparency.

Conclusion

Government subsidies are an important tool in the transition to a green economy. They serve sustainable development by increasing economic, environmental, and social efficiency. A system of indicators, analysis, and monitoring are necessary for measuring effectiveness. In order for the measures taken in Uzbekistan to transition to a green economy to be effective, it is necessary to take into account a systematic approach and international experience.

Thus, the transition to a green economy through subsidies can become more sustainable and effective.

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