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STATE-RUN SUPPORT PROGRAMS FOR BIOECONOMY

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Abstract

In the global world, the bioeconomy is increasingly penetrating into all economic sectors and an optimal management structure is needed to ensure its sustainable development. National Bioeconomic Regulation Strategies are drawn up in the form of state programs. They set forth goals and objectives, specific directions, forms, principles, and methods of government in this area. In modern Russia, a “Comprehensive Biotechnology Development Program in the Russian Federation (RF) for the Period up to 2020” and a number of practical and standard-setting documents have been adopted. Achievement of 6 goals of scientific, industrial and technological importance, the solution of a complex (9) of urgent goals in the socio-economic, organizational, energy, economic, scientific, educational, legal and informational areas has been declared. The model for stimulating the development of biotechnology in Russia is mainly based on world-recognized tools and forms of support, a model inherent in countries where the policy on biotechnology and its products has not been fully settled yet and is combinational. In Russia, the growth factors of the bioeconomy are not sufficiently implemented yet and there is a tendency to move from ambitious projects in this area to more realistic and low-cost ones, and there are transformations in the choice of priorities.

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Keywords: Bioeconomy, strategy, state program, tools and forms of support, dynamic trends, monitoring.



1. Introduction

The bioeconomy is based on the application of biological principles and processes in all sectors of the economy and is not represented as a separate industry or a unique field of activity. For its development, new types of social and institutional mechanisms of interaction are relevant (Wield, Hanlin, Mitra, & Smith, 2013). Its success depends on solving technical, economic, social and political problems (Pfau, Hagens, Dankbaar, & Smits, 2014). There are probabilities of high costs in biological transformations (Bröring, Baum, Butkowski, & Kircher, 2017). It is believed that in order to ensure sustainable development of this sector, an optimal management structure is needed (von Braun & Birner, 2017). Initially, the focus was on governance in various states and in selected sectors of the bioeconomy (Purkus, Röder, Gawel, Thrän, & Thornley, 2015; Pannicke, Gawel, Hagemann, Purkus, & Strunz, 2015; Bosman & Rotmans, 2016), which contributed to the formation of country and industrial differences.

2. Problem Statement

National Bioeconomic Development Strategies are formalized in the form of government programs. They set out goals and objectives, specific directions, forms, principles and methods of state regulation in this sphere. In 2012, the national bioeconomy blueprint program was adopted in the leading US bioeconomy. In the same year, the EU approved the “Innovating for Sustainable Growth: A Bioeconomy for Europe” program. This document is aimed at addressing issues of sustainable development on two basic concepts of an integrated approach to solve social problems and development a coherent bioeconomy. Related projects are in place in many other countries.

In Germany, a unified state biotechnology support program is being successfully implemented. However, as Meyer (2017) shows, two regions (North Rhine-Westphalia and Baden-Württemberg) have their own bioeconomic strategies. Moreover, in the first case, it is a short, five-page document, which reflects the objectives, the main areas of application and the proposed political approach. Then in the second case, the Strategy describes an extensive assessment of the research environment of Baden-Württemberg related to the bioeconomy, including SWOT (strengths, weaknesses, opportunities and threats) analysis and description, and outlines three research topics with appropriate funding.

Recently, some results of the implementation of national strategies, including 41 countries of the world, differing by geography, the level of development, goals and objectives (Dietz et al., 2018) have been summed up. At the same time, for the global bioeconomy, El-Chickakli, von Braun, Lang, Barben, Philp (2016) propose to implement the principle of unification through international bodies on politics, trade relations and the corporate sector.

Great prospects for the bioeconomy are opening up in Russia (Kudryavceva, Yakovleva, & Golovin, 2016; Vasilov, 2016; Akkanina & Romanyuk, 2016; Andreenko, Bartosh, & Boblyov, 2017). Baryshnikova and Baryshnikov (2017) see strategic factors of economic leadership in the bioeconomy special attention is paid to new biotechnologies (Kuznecov, 2015; Gabibov, 2016).

3. Research Questions

In modern Russia, an attempt has been made to create a national bioeconomic development system based on the Strategic Document. It was adopted at about the same time as developed countries under the

name “Comprehensive Program for the Development of Biotechnologies in the Russian Federation (RF) for the Period up to 2020” (decree of the Government of the Russian Federation No. 1853p-P8 of April 24, 2012), subsequently named “Bio 2020. Achievement of 6 goals of scientific, industrial and technological importance, the solution of a complex (9) of urgent tasks in the socio-economic, organizational, energy, economic, scientific, educational, legal and informational areas has been declared. For practical implementation, a Plan of Measures was developed (“road map”) “Development of Biotechnologies and Genetic Engineering” (decree of the Government of the Russian Federation No. 1247-r dated July 18, 2013). The main project coordinator is the Ministry of Economic Development of the Russian Federation. At the final stage of the Strategy implementation, the country was expected to reach the leading position in the world in the field of biotechnology in all areas, increasing the volume of production of biotechnological products by 33 times and its consumption by almost 8 times. However, over the past period, much has changed, both in the country and in the world. Former plans undergo transformations that become objects of study.

4. Purpose of the Study

The purpose of the study is to assess dynamic trends of state program documents supporting the bioeconomy in Russia for monitoring the biotechnology development in the country.

5. Research Methods

European bioeconomic programs are considered the most socialized. These, including the BioSTEP project, allow estimating the scope of measures to ensure effective bioeconomic management. The governments of countries are the source of the regulatory framework that forms and contributes to the development and growth of new scientific, technological and economic knowledge, and they plan to use, standardize and certify consumer products; are the main source of direct funding for research and development (R & D), educational institutions and education systems; allocate grants for research and development, innovation, education, training, entrepreneurship and projects that study changes in household behavior; use a system of government procurement of biotech products and services. The authorities also fund measures and systems for planning and collecting information that can support new measures (for example, planning, forecasting, and the development and collection of statistical data). The authorities support the bioeconomy by disseminating information, such as the benefits of consumer products based on biotechnology, the need to change individual and group behavior of households, as well as new opportunities for education and employment. Finally, the authorities promote broad participation through consultation mechanisms, dialogue and joint decision-making, which include a wide range of stakeholders and the public (for example, research and practice panels and forums, events and conferences, public consultations, public surveys, focus groups, work advisory committees). The use of this experience is very relevant for all states developing the bioeconomy. At the same time, it is believed that at first, civil society organizations played a minor role in shaping the bioeconomic policy. The lack of discussion, public opinion, ignoring the dialogue is interpreted as a “democratic deficit” of the bioeconomy (Gottwald, 2015).

A comparative analysis of state bioeconomic development programs in Russia serves as a methodological basis for the study.

6. Findings

The model of stimulating the biotechnological development in Russia is mainly based on the world's recognized tools and forms of support (Table 01).

Table 01. The main tools and forms of support for the bioeconomy in the Russian Federation

Demand stimulation	Improving competitiveness	Development of education and science	Development of experimental base
Maintenance and development of biocollections	Interaction of business, science and education	Support for biotechnologies in the regions	International cooperation
	Development of information and analytical infrastructure	Support for biotech platforms and clusters	


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    graph LR
      A[Subsidies] --> B[Soft loans]
      B --> C[Tax breaks]
      C --> D[Preferential rates]
      D --> E[Budget resources]
    
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The 2012 Russian Strategy should be recognized as a very ambitious, but not having the prospect of full implementation. First of all, in our opinion, due to the lack of a comprehensive legal framework and key investors, among which could be companies in the oil and gas sector, especially state-owned companies, and the lack of real and sufficient funding, including from the state budget.

In 2018, the Russian Federation adopted a Plan of Measures (“roadmap”): “Development of Biotechnologies and Genetic Engineering” (decree of the Government of the Russian Federation No. 1247-r dated July 18, 2013). The goal of the roadmap corresponds to the All-Russian strategic document on the development of biotechnology, adopted in 2012. The Plan of Measures is aimed at “developing domestic demand, production and export of biotechnological products, as well as creating institutional conditions for conducting an in-depth modernization of the technological base of the industry due to the massive introduction of methods and products of biotechnology in production”. This document notes that system-wide development measures and support for priority sectors will be implemented. A significant number of participants are involved in the project: 8 ministries and 7 federal departments, a circle of interested structures is noted. At the same time, the current “road map” is a rather heavily revised previous plan of measures - 2013. The project, unlike the previous one, is not so ambitious, more practical and more realistic. The list of priority biotechnology sectors with a biomedical bias is preserved, as well as: industrial, agricultural, forestry, environmental, genetic engineering, bioenergy, except for food and marine biotechnology. To reflect the bioeconomic development, subject indicators are used, the number of which (6) is incomparable, almost 6 times less than it was in the Strategic Program for the Development of the Bioeconomy, when it was planned to diagnose 34 indicators.

In the “roadmap” - 2018, great attention is paid to production centers that are engaged in collective use for the development and preclinical research of biomedical cell products, as well as owning licenses for the production of biomedical cell products. However, if there is only one center for the whole country in 2018, moreover, without a production license, then in 2020 it is planned to have two institutions. At the same time, it is planned to get a significant (10 times) increase in the number of accredited structures for studying biomedical cell products from 5 in 2018 to 50 in 2020.

Industrial biotechnologies should give an increase in production volumes from 12.9 billion rubles in 2018 to 14.8 billion rubles in 2020. For 2 years, an increase of 1.9 billion rubles is obtained, that is, only 14.7 % or slightly more than 7% per year. Actually, this is not enough, especially considering the accelerated inflation in recent years. Such an “improvement” of the project does not reflect the above idea of “mass introduction of biotechnology methods and products into production”.

The document assumes the implementation of 29 measures to support individual biotechnological sectors, more than half (17 measures) of which will be on expiration dates in 2018. Seven measures include “proposal preparation”. Based on this, it can be stated with confidence that the 2018 document is largely inferior to the original strategic plans.

Along with the presented materials, the development of individual bioeconomic areas is prescribed in the sectoral law-making documents. To support fisheries biotechnology (aquaculture), the following federal laws were adopted: 1) “On Fisheries and Conservation of Aquatic Biological Resources” No. 166-FL dated 20.12.2004; and 2) “On Aquaculture (Fish Farming) and on Amendments to Certain Legislative Acts of the Russian Federation ”dated 02.07.2013 No. 148-FL, as well as the State Program of the Russian Federation “ Development of the Fisheries Complex” (Resolution of the Government of the Russian Federation No. 314dated 15.04.2014), the sectoral program “Development of Commodity Aquaculture (Commercial Fisheries) in the Russian Federations for 2015-2020 years” (decree of the Ministry of Agriculture of the Russian Federation No. 10 dated January 16, 2015).

In the field of the bioenergy there are: “The Energy Strategy of Russia for the period until 2030” (decree of the Government of the Russian Federation No. 1715-r dated November 13, 2009); State Program of the Russian Federation “Energy Saving and Increasing Energy Efficiency for the Period up to 2020”, (decree of the Government of the Russian Federation No. 2446-r dated December 27 2010); “The Main Directions of the State Policy in the Field of Increasing the Energy Efficiency of the Electric Power Industry Based on the Use of Renewable Energy Sources for the Period up to 2020”, (decree of the Government of the Russian Federation No. 1-p dated January 8 2009), Federal Law “On Electric Power Industry” No. 273-FL dated July 29, 2017. Along with this, some researchers consider this to be insufficient and it is proposed to develop a special law on domestic bioenergy (Vasil'ev, Kovalev, & Chizhikov, 2015).

Using these documents, we can state practical decisions of the authorities, which foresee measures of financial support for projects on the production of electricity based on bioresources processing, which imply the allocation of subsidies for the purchase of equipment, the allocation of loans on concessional terms, tax relief. The issues of facilitating energy service structures that start small energy projects based on the processing of bio-resources should be addressed. It is important to encourage enterprises engaged in the sale of electricity produced from renewable energy sources (RES) and various bioresources, to

purchase according to a certain schedule and tariffs, apparently in the environment of its budgetary co-financing to ensure competitive consumption conditions with other energy sources.

In view of the underdeveloped production of own technological equipment, as well as components and spare parts, it is significant to import them into the Russian Federation from abroad without VAT, this also applies to equipment for the production of biotechnological products. It would be rational to develop local production of analogs or original modern models of equipment and machines corresponding to world standards. A positive role can be played by the state support of electricity producers who use “green” technologies created by modern garbology. They recycle solid municipal waste, peat biomass, forestry and agriculture waste. The identification of Economic Activities in the codes of the All-Russian Classification foresees the processing of waste to obtain energy from biological resources.

Protection from the state is expected by entrepreneurs who are implementing or planning to implement investment projects in the field of small bioenergy for the recycling of agricultural and municipal waste to generate electricity and heat. They demand subsidies for the reimbursement of part of the interest rate on loans. On the other hand, it requires a tightening of penalties for economic entities that do not deal with recycling of bio-waste.

The support of R & D on innovative technologies in the field of the bioenergy is also very important: supplement educational programs in secondary vocational education and higher education institutions that correspond to priority areas of the bioeconomy and bioenergy: develop environmental education at schools and in the workplace; accumulate and systemize the information on modern developments of world and domestic research centers in the field of renewable energy.

7. Conclusion

In world practice, there are three main models of incentives for the bioeconomy, which differ mainly in relation to biotechnological products. In Russia, a model has been developed that is typical of countries where the biotechnological policy and its products has not been fully settled yet and has a certain combinational character.

The determinants of the global bioeconomic development, supported by the authorities, are: high volumes of industry financing; a large number and high level of specialized educational and research institutions; significant resources of highly qualified personnel; stimulating policy of the authorities in financial, tax and labor regulation, which is accompanied by a high level of return on investments (Sidorov, 2016). In Russia, the growth factors of the bioeconomy are not sufficiently implemented yet and there is a tendency to move from ambitious projects in this area to more realistic and low-cost ones.

Due to the strength of the developed countries, and a high level of the national bioeconomy in the USA, Switzerland, Germany, France, the UK, Japan and others, and transnational activities of the largest biotechnological companies (Sidorov, 2017), it should be recognized that the exclusively independent and uncontrolled development of this economic sector does not seem possible. In this regard, the most important role of the state is seen in attracting major strategic investors, including domestic ones, using advanced and successful Russian and global practices, establishing interactions and mutually beneficial relations with the subjects of the global bioeconomy while maintaining the domestic policy of developing its industries, consistent with the national goals of the bioeconomic development.

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