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GREEN ECONOMY IN RUSSIA: THE INVESTMENTS' REVIEW, INDICATORS OF GROWTH AND DEVELOPMENT PROSPECTS

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Abstract. Currently the "green" economy is an important part of positioning in the international arena as an environmental component of sustainable development. Russia, as an active party in the international arena, supports resolutions on the "green" economy development and "green" financing tools for resolving issues of climate-resistant economic growth. Factors and trends in the Russian "green" economy development are radically different from most developed countries. At the same time, Russia has undeniable advantages in terms of preserving natural landscapes and the ecosystem services' potential. Russia also has huge and almost unused opportunities for "green" growth. Our article is devoted to these problematic economic issues related to the "green" investment development. It is a basis for environmentally sustainable evolution. We discuss the latest trends and facts in the the"green" economy development of Russia. In addition, we describe possible promising directions for its growth in the future. Our results can be interesting and useful for researchers and experts working in the field of strategic management, spatial development and innovation economics. It is attractive for stakeholders and politicians involved in the economics and environment issues.

Keywords: "green" economy; "green" investment; "green" growth; sustainable development; social responsibility; low-carbon development

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JEL Classifications: Q5, Q01, P28, O13, G3

Additional disciplines: ecology and environment

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1. Introduction

According to the Resolution adopted in 2012 by the UNO General Assembly, economic development leads to rapid accumulation of physical and human capital today. It is carried out at the expense into excessive depletion, degradation of natural capital and increasing inequality between people (The future we want, UN, 2012). Most of the world's countries agree with this aspect at the global level. Particularly in 2016-2017, 132 countries proposed a number of initiatives at the state level in the "green" economy developing area. These countries account 82% of all harmful emissions. As a result, the states that did not participate in the development of rules and standards in the "green" financing area need to accept the conditions and rules for the "green" economic model's development functioning today. These conditions and rules were developed by more active countries (Ministry of Finance of the Russian Federation 2017). As a result of the Paris agreement on climate change, all countries, including Russia, are required to have long-term low-carbon development strategies and plans for climate change adaptation and to implement appropriate measures. At the same time, the Paris agreement assumes the voluntary contribution principle for each country to the solution of the global problem into climate change (Principles of sustainable development, VEB RF 2016).

Taking into account Russia's membership in the UNO, it should be noted that the country's movement towards sustainable development requires a close study of foreign practice in forming a "green" economy model by the adaptive approaches. It is important to keep in mind that sustainable development is such form of development that is socially responsible, economically realistic and environmentally friendly (Tarkhanova, 2018). According to R. Perelet "the search for a new development model has led to the evolution of the sustainable development paradigm, the concept emergence of a "green" (ecological) economy and a deeper understanding that the economy and society should fit into natural systems and their limitations but not vice versa" (Perelet, 2011). Of course, the green economy is not a separate segment of the economy but it is its new adequate appearance (Dvoretzkaya, 2017).

2. Literature review

Comparing the use of green economy in politics with conceptual approaches, it should be noted that the concept of green economy in the academic world has a long history. According to Loiseau, Saikku, Antikainen and others, "green economy" – term was firstly introduced by Pearce D. in 1989. This British researcher and his co-authors introduced it in response to the underestimation of environmental and social costs in the current price system (Loiseau et al., 2016). In particular, Pearce D. concluded that the "green" economy is the middle way to achieve sustainable development between the rejection of any economic growth or activity limitation and unrestricted free markets (Pearce, 1992). The expansion of the "green" economy concept has started and continues today due to British experts (Pearce, 1992; Barbier, 1987) in the field of environmental economics.

In fact, there is no generally accepted definition of a "green" economy. This is a rather controversial term that can be defined from various points of view, based on options for strategies depending on interests and worldview (Pattberg & Zelli, 2015; Mazzoni, 2020). Experts of the United Nations environmental protection organization (UNEP) have a fairly broad view of the green economy. They suggest define it as an economic activity that "increases the well-being of people and ensures social justice and significantly reduces risks to the environment (Towards a "green" economy, UNEP 2011). It is also the "green" economy definition in the Russian legal field in terms of sustainable development. If we consider this concept more narrowly, we can find that the "green"

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economy includes some types and results of economic activity that contribute the life quality improving and living environment. It happens with modernization and increasing production efficiency. According to Qingqing Weng, He Xu and Yijun Ji, all available definitions show that a "green" economy is an "umbrella" concept. It includes various consequences for growth and well-being or reducing efficiency and risks with natural resources using (Weng et al., 2018).

Today the "green" economy concept is positively perceived by Russian science. There is a variety of publications into this area in recent years (Lipina et al., 2017; Zhitovskaya, 2016; Chernomorova, 2016; Pchelincev, 2016). However, despite the large number of scientific publications devoted to the "green" economy, the problem of forming the "green" economic growth's model in Russia is studied insufficiently.

The importance of "green" growth is often discussed at the state level in Russia. According to the approved "Fundamentals of the state policy in the Russian Federation environmental development field for the period up to 2030", the strategic goal of the state policy in the environmental development field is to solve socio-economic problems. They ensure environmentally oriented economic growth. There is also a favorable environment preservation of biological diversity and natural resources. The claim to meet the needs of current and future generations, to realize the right of everyone to a favorable environment, strengthening the law in the environmental protection field and environmental safety are mentioned there (Fundamentals in state policy into the field of the Russian Federation environmental development for the period up to 2030). Moreover, the "green" theme has recently become an agenda for the Bank of Russia (Central Bank of the Russian Federation 2019). Global challenges related to climate change, accumulated environmental damage and reduced biodiversity are contributed to the creation and development of special institutions and financial instruments for sustainable development. They also include green bonds on foreign financial markets. It happens in accordance with the main development directions of the Russian financial market for the period 2019-2021. Russia can not stand by and must join the global process. This country must work out the national system's formation of financial instruments for sustainable development, the methodological and verification system's organization for responsible financing instruments.

This article discusses promising directions for the "green" economy development in Russia. It includes "green" investment issues and "green" growth assessment with the key indicators' using. We analyze the dynamics, the "green" investments' share and the structure of their funding sources. The study is based on an extensive amount of scientific literature. It allows us to make comparisons, provide relevant examples, extrapolate our ideas and results.

3. Materials and Methods

The methodology of the study was based on the methods of calculating the dynamics indicators characterizing the "green" economy data and data on "green" investment, as well as on a comparative analysis. In order to achieve the objectives, we used specific data from the Federal State Statistic Service in terms of green investment in accordance with the implementation of the investments' dynamics in fixed capital aimed at environmental protection and rational use of natural resources in 2000-2018. In order to analyze and assess the results of the green investment, we used the methods of comparing the calculated indicators of "green" growth of according to the Global Cleantech Innovation Index and data on the Global green economy index.

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4. Results and Discussion

Adopting a new paradigm for social development implies a transition to a circular economy. The above requires the reduction of greenhouse gas emissions, the utilization of wastes, and the use of renewable energy sources (Bazaluk et al., 2020). The "green" economy does not only recognize and take into account the importance of natural capital. It also provides for investments into environmental protection in order to preserve and increase it.

Climate change is a serious threat to the planet. The implementation of the Paris agreement on climate change in 2016 make it possible to draw the attention for investors and businesses to the necessity, inevitability and acceleration of the international transition to a "green" economy. Presumably, the implementation of this agreement can speed up the technological innovations' introduction and appropriate policies that allow investing in "green" and low-carbon assets, projects (International Finance Corporation 2016).

Moreover, huge investments are needed to finance and support projects for the environmental protection. Among them there are less carbon-intensive technologies and infrastructure. The question is how to make buildings and entire cities more water-and energy-efficient, based on wind and solar power stations, low-carbon transport and technologies (Peeters, 2005; Štreimikienė et al., 2016; Moumen et al., 2019).

Morgan Stanley Capital International (MSCI) experts dealing with environmental, social and managerial aspects have developed special tools for investors (see Table 1). They can implement their responsible investment strategies, excluding assets with high greenhouse gas (GHG) emissions from their portfolio.

Table 1. Special tools for implementing a responsible investment strategy

MSCI ESG CARBON METRICS	quantitative information on GHG emissions and carbon intensity, reserves and potential emissions by type of fossil fuel for more than 8,500 companies.
MSCI ESG CLEANTECH METRICS	defines the prospects for the development of "clean" technologies in five areas: alternative energy; energy efficiency; "green" construction; pollution prevention; water resources management by the sustainable development principles.
MSCI CARBON PORTFOLIO ANALYTICS	evaluates the "carbon track" and "carbon risks" for portfolio of assets with benchmarking.
CARBON FOOTPRINT CALCULATOR.	allows you to generate statistics on GHG emissions at the button's touch (built on the basis of Microsoft Excel).
MSCI GLOBAL LOW CARBON AND ENVIRONMENTAL INDEXES	indexes that allow comparisons on the level of environmental responsibility and GHG.

Source: compiled by the authors

Sustainable or responsible investment as an investment model appeared with the introduction of the sustainable development concept in 2012 (United Nations Conference on Sustainable Development 2012). The purpose of this investment is not only to generate income for the investor, but also to create positive social changes, reduce the negative impact on the natural environment with ethical standards (Ministry of Finance of the Russian Federation 2017).

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It is significant that the practice of socially responsible investment in Russia has not yet received proper development. In particular, a national regulatory system and a strategy for setting standards on socially responsible investment are not established. At the same time, some Russian companies are already acting as participants in the responsible investment's field.

Regular measures' implementation aimed at nature protection and construction of treatment facilities are required to improve the environment and further reduce emissions of harmful substances into the atmosphere. These measures require huge investments in the "green" economy.

There are some priority sectors for "green" investment in the global aspect (see Fig. 1) in accordance with the concept of UNEP. This organisation promotes actively the "green" model formation of economic development. They are: forest sector (afforestation strife); agriculture (developing sustainable management); water resources sector (solving water supply problems and improving water consumption efficiency); "green" fishery (overcoming a sharp drop in fish stocks); energy sector (the transition to alternative energy sources and production, increase of its use efficiency); industrial production (eco-efficiency increasing); green transport (development of environmental and energy-efficient transport modes); eco-tourism (the "green" infrastructure development, new types of eco-tourism, maintenance of biodiversity); "green" construction (construction of new "green" buildings and existing buildings' renovation).

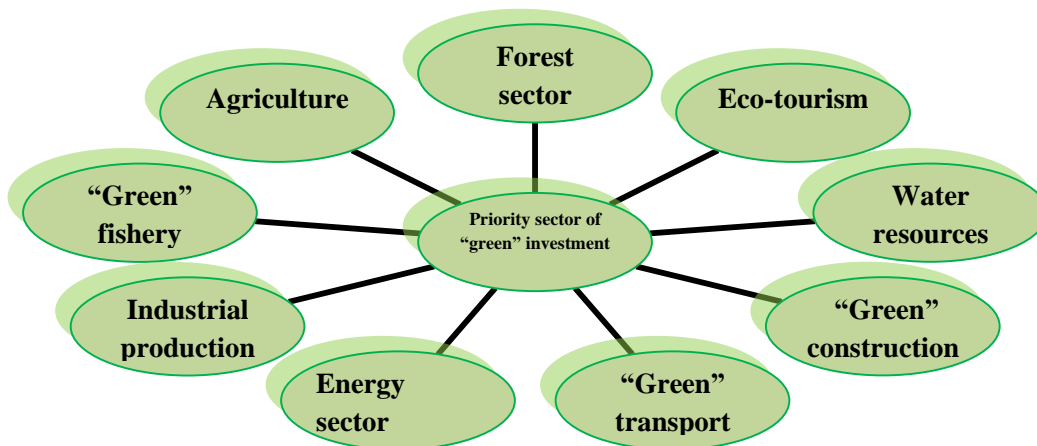


Fig. 1. Priority sectors of "green" investment
Source: compiled by the authors

In our opinion, the alternative energy is the foundation of "green" growth in Russia among the represented sectors. It is due to:

- firstly, the importance of the energy sector in the economy. It plays a fundamental role into the economic development and national security of the country. The alternative energy sources development is promising and highly perspective. It is despite the fact that the territories and subsoil of

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Russia are quite rich in energy resources. This trend is very characteristic and significant for the Federal regions that use imported fuel;

- secondly, the increasing trend of depletion into the most affordable and profitable reserves of classical energy resources;

- thirdly, global climate changes and the need to reduce greenhouse gas emissions, the growth of which is caused by man-made emissions from energy sector facilities.

Analysis of the dynamics into alternative energy development in Russia shows that our country is currently far behind not only the leading countries but also the Eastern Europe countries. There is a worldwide rapid growth of renewable energy sources (RES). The RES share in energy production for the period of 2003-2018 increased from 2% to 10%. It is expected to 11.2% in 2020. The alternative energy share in the Russian energy sector was approximately 0.3% in the installed capacity of the Russian UES and 0.1% in the structure of electricity generation in 2018.

Today, the main problem in the modern alternative energy development in Russia is the low level of its financing. According to the forecasts of the international energy agency (IEA), Russian energy needs investment in the amount of \$2.7 trillion for the period from 2014 to 2035.

Examining the countries' experience that have achieved impressive success in the field of "greening" the economy, we can note that environmental costs were: in Germany – 0.6% of GDP, in the Netherlands- 1.4% of GDP, in France-1% of GDP, in Japan-1.2% of GDP. As for Russia, the share of environmental protection costs has not changed much since 2009 (0.7% of GDP). According to some experts, it is necessary to spend at least 1.3% of GDP on forming a "green" finance system every year in Russia to achieve significant success into this field (Panda, 2017).

According to Rosstat data, the results into the field of the "green" economy investment in Russia are significantly demonstrated by the dynamics of the investments' volume in fixed capital. They were aimed at environment protection and rational use of natural resources in 2000-2017. Figure 2 illustrates this process over the past 18 years.

The studied period of 2008-2010 shows a negative trend. It is characterized by a relative increase in "green" investments. At the same time, Russia tried to maintain the priority of investments in fixed capital aimed at the environmental protection and rational use of natural resources even in the crisis years (2008-2009). The dominant volume of investments in fixed capital aimed at environmental protection and rational use of natural resources during the analyzed period was in 2014.

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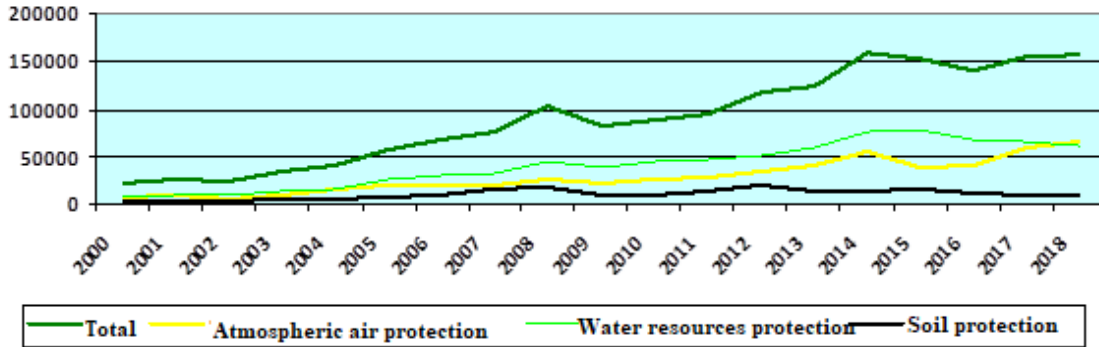


Fig. 2. Investments' dynamics in fixed capital aimed at environmental protection and rational use of natural resources in 2000-2018, million rubles.

Source: compiled by the authors, based on the data of Federal State Statistic Service of Russia

It is important to note that the main amount of funds during the study period was mainly addressed to the water resources' protection. The year 2018 has become more significant due to changes into existing trends in terms of investment directions. The investments in air protection have become the most significant.

The structure of financing sources for "green" investments is specific in Russia. It is significantly that the basic flow of "green" investments in Russia is provided by the own enterprises funds' expenses in contrast to foreign countries. The main investors of "green" investments are the specialized manufacturers and the public sector (see Fig. 3).

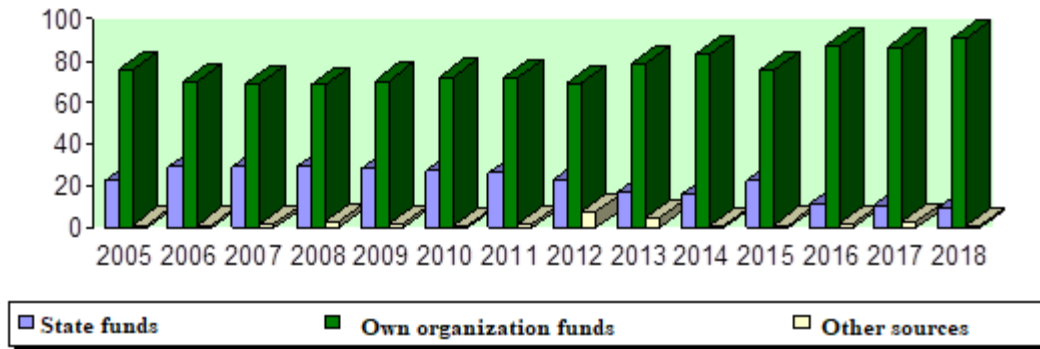


Fig. 3. Sources' structure for "green" investments' financing in Russia in 2005-2018, %

Source: compiled by the authors, based on the data of Federal State Statistic Service of Russia

In the study's continuation about the "green" investments in Russia, the attention is drawn to the peculiarities of their distribution by the economic activity type. The priority of the most "green" countries is investment in the production and distribution of electricity, gas, water and manufacturing (100% of total green investment). Unlike of them, the metallurgical production, coke and petroleum

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products' manufacturing, chemical production lead in Russia. In addition, the assessment for "green" investments in the regional aspect shows their extremely uneven placement on the Russian territory.

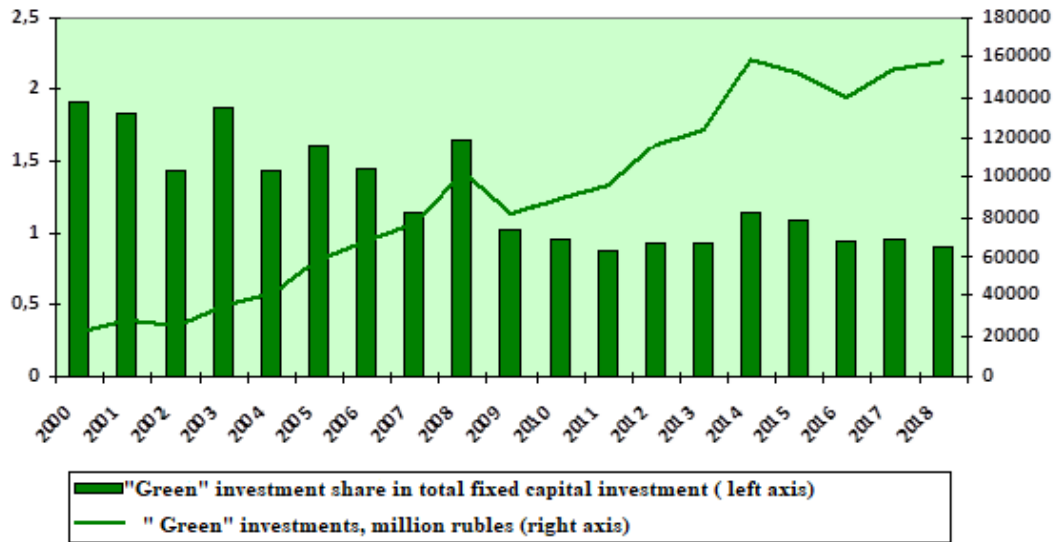


Fig. 4. Total "green" investment dynamics and "green" investment share in total fixed capital investment in Russia for the period 2000-2018.

Source: compiled by the authors, based on the data of Federal State Statistic Service of Russia

Figure 4 illustrates the total volume dynamics of "green" investments in Russia. We can see that the "green" investments in Russia occupy a fairly low share of investments into the fixed capital in contrast to European countries. This share has been constantly decreasing since 2000.

The movement towards sustainable economical development determines the need to evaluate certain countries' achievements in the field of "green" economy. It can be made by using various qualitative macro-indicators for creating environmental ratings and rankings. Today there are some indicators, the most informative from the point of view of the effectiveness into the "greening" economy implementation's process. They are: global index of innovation in environmentally friendly technologies; efficiency index action in the field of climate change; the index of environmental efficiency; environmental track; environmental vulnerability index; low-carbon economy index; environmental policy rigidity index; global green economy index (OECD 2018).

Russia took the 39th place in 2017 (see Table 2), the input and output of innovations was significantly lower than the average rate in the world, according to the countries' rating on the global index of innovations in the environmentally friendly technologies' field (GCII). According to the global index of innovation in the environmentally friendly technologies' field, Russia lacks a strong entrepreneurial culture and orderly structure for supporting the national innovation ecosystem. The country's weakness is in innovation drivers related to the environmentally friendly technologies. It is particularly evident in the regulatory system that Russia does not support innovation in the environmentally friendly technologies' field. There is the lack of specific industrial clusters in the environmentally friendly

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technologies’ field and the absence of any private local investors in environmentally friendly technologies. The lack of successful startups is in contrast to the small amount of venture capital funding in Russia. It indicates strong research in the field of clean technologies and intellectual property protection. There were 1,279 patents for technologies related to environmentally friendly technologies in 2013. It does not lead to any significant commercial clean technologies in Russia. The evidence is into the lack of activity in the clean technologies’ field and investments (GCII). However, the country shows relative confidence in the energy sector.

Table 2. Ranking of countries on the global innovations’ index in the environmentally friendly technologies’ field in 2014 and in 2017.

2014			2017		
Ranking position	Country	Indicator value	Ranking position	Country	Indicator value
1	Israel	4,34	1	Denmark	4,07
2	Finland	4,04	2	Finland	3,96
3	USA	3,67	3	Sweden	3,86
4	Sweden	3,55	4	Canada	3,76
5	Denmark	3,45	5	USA	3,59
.....
36	Mexico	1,15	36	Argentina	0,84
37	Poland	1,03	37	Bulgaria	0,83
38	Bulgaria	1,01	38	Saudi Arabia	0,67
39	Greece	0,97	39	Russia	0,65
40	Russia	0,81	40	Indonesia	0,60

Source: compiled by the authors, based on the data of Global Cleantech Innovation Index (GCII)

The Global green economy index (GGEI) is an important indicator of the effective "greening" process implementing by the countries. It was the first "green" economy index released in 2010. This index is now the most widely used product at the international level. It is used by the policy makers, international organizations, civil society and private sector. Like many indexes, GGEI is used to evaluate performance and to inform about areas that need improvement. It also demonstrates to various stakeholders how they can contribute to progress. The GGEI is particularly relevant in today's realities. It is due to the countries seeking to implement new emission reduction and sustainable development. They will need data to determine the best method to a low-carbon economy (see Fig. 5) (OECD 2018).

Fig. 5 illustrates the difference in the global green economy index (GGEI) in different countries in 2018. You can see that the leading positions belong to Sweden, Switzerland, Iceland and Norway, while Russia and Poland lag behind.

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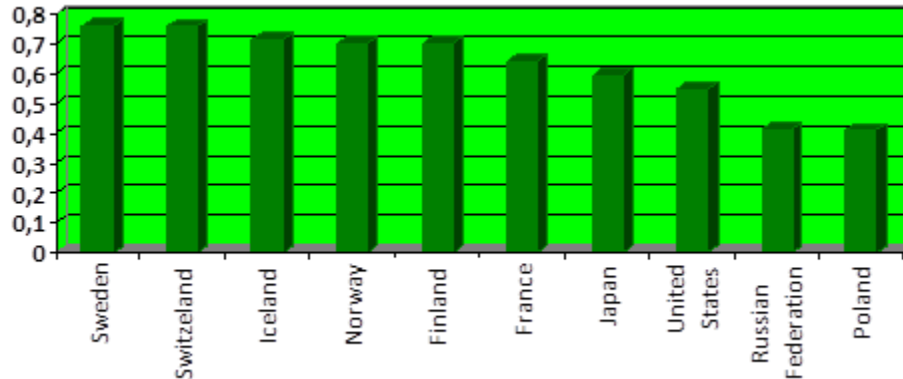


Fig. 5. Global green economy index (GGEI) in different countries in 2018

Source: compiled by the authors, based on the data of Global green economy index 2018

As noted above, only a few Russian companies currently participate in global initiatives into the field of sustainable development and green finance (Tarkhanova et al, 2020). A good example is the association of more than 50 participants in the Russian network of the UNO Global compact. It includes large companies, small and medium-sized businesses, business associations, public organizations and academic institutions from 16 Russian regions (Vnesheconombank, PJSC “Norilsk Nickel”, PJSC “Severstal”, JSC “RUSAL”, PJSC “OC“Rosneft”, PJSC “LUKOIL” and others). The UNO global compact network was launched in Russia in 2008. The UNO Global compact participants’ activities are based on the concept of sustainable development. It combines three main areas: economic, social and environmental area. Several Russian companies on their information Internet portals declare the reports’ preparation on the standards of sustainable development-GRI (Ministry of Finance of the Russian Federation 2017).

Vnesheconombank (VEB) is one of the leaders into the Russian financial market in the field of corporate social responsibility and sustainable development. Here is also Sberbank of Russia, Atomenergobank and other companies over the past years. Vnesheconombank (VEB) has significant capital investments in "green" investments. Vnesheconombank is the chairman and leader of the UNO global compact network since 2013. Today, Vnesheconombank considers a number of projects that belong to the "green" category. There are initiatives in the field of solar and wind energy, solid municipal waste’s disposal and "smart" electric networks’ creation. Vnesheconombank considers the green direction in its activities as a tool for improving export competitiveness. It is a platform for interaction with national and international development institutions. Special green finance tools are developed together with the Bank of Russia, the Moscow Exchange and market participants.

There is no doubt that in Russia, the importance of the "green" economy in general and of clean energy in particular will increase as in the rest of the world. According to certain estimates, in 2025, the global market for environmentally friendly equipment will reach 4.4 trillion euros (about \$ 6 trillion). It will be more than 30% of average annual growth for the "green" economy and an increase in its contribution to

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world GDP to 6-7%. Russia plans to use revolutionary technologies in the energy saving field, including new nanotechnology in order to reduce emissions of harmful substances. There is no doubt that the innovative model for Russian energy development and increasing the energy efficiency of the country's economy will become a strategic directions to the "green" model of the country's economic development. It is important to note the active development of renewable energy sources (RES) in Russia. There are solar and wind generation, small hydropower and biomass energy production. Moreover, the main strategic objectives for the "green" economy development in Russia will be: healthy environment; environmentally safe production; efficient environmental sector of the economy in the nearest future.

Conclusions

The conducted study of the "green" economy development in Russia has showed that the relative growth of the "green" investments was recorded in the period from 2000 to 2018. According to the indicators of "green" growth, Russia tries to maintain the priority of "green" investment. Russia remains significantly behind the leading countries of the world. A characteristic feature of the "green" investment system in Russia is noted. This feature is related to the structure of financing sources for "green" investments. In particular, the main financing is provided by the enterprises' own funds, rather than by the state and specialized manufacturers. This problem forms a key component of the further economy development. It is the adjustment for the current model of economic development with the mandatory participation for all interested parties. Today there are some key problems that hinder the development of "green" investment in Russia. They are: the lack of a legal framework for regulating "green" investment, a system of state support for "green" investments' attracting and a system for "green" securities' verifying. The presented considerations allow to conclude that in order to achieve the goal of creating a "green" economy in Russia, it is necessary to apply a systematic and comprehensive approach. It will eliminate all obstacles and mobilize financial resources to ensure sustainable development.

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