Green Technologies Are the Foundations of the Future

A. A. Bisultanova
Kadyrov Chechen State University, Grozny, Russia

Keywords: Sustainable development of territories, ecological catastrophe, principles of sustainable development, green technologies.

Abstract: The article discusses the main advantages of the introduction of green technologies. It was emphasized that humanity is on the verge of an ecological catastrophe and the leaders of all countries should take the necessary measures to reduce the impact of human waste products on the overall environmental situation. The green economy is an alternative and the only solution in today's difficult conditions of environmental pollution, and its necessity must be emphasized by economic, social, and political actions. The article argues that the effectiveness of the introduction of green technologies depends entirely on the combination of public policy and the economic policy of the private sector. The author pays great attention to the role of the state in the effectiveness of the development and implementation of green economy technologies. The author emphasized that the uncertainty of state policy regarding the legal, economic and political basis for the introduction of green technologies, ultimately, is costly for our planet.

1 INTRODUCTION

Green technology is a comprehensive term that is based on the use of science and technology to protect the environment. Many methods fall under this term, such as the use of green chemistry, environmental monitoring and much more. The point of all these technologies is to ensure that the environment remains protected and that the damage that has already been done to it can be repaired to some extent. It is also called environmental technology or "clean" technology. Attention has been paid to green technologies since 1990, these technologies guarantee that the Earth will remain healthy for the entire duration of life on it (Figovsky, 2018; Burmatova, 2021; UNEP, 2011). In general, the concept of green technologies can be viewed from different angles (Figure 1):

Speaking about the advantages of using green technologies, first of all, it is worth noting that with the help of green technologies, waste can be recycled, which allows waste to be used for useful purposes for humans. With the help of waste recycling technologies, a lot of useful things are created, for example, fertilizers for plants, fuel, furniture, etc. Also, with the help of green technologies, it is possible to effectively purify water, since everyone knows that there is a shortage of clean drinking water on the planet. It is thanks to green technologies that this problem can be solved.

Another direction of the introduction of green technologies is the fight against carbon dioxide emissions. Green technologies help to reduce carbon dioxide emissions and clean the air, which is polluted by human waste products from day to day. Moreover, the following observation was made - the higher the level of development of science and technology in the region, the more polluted the environment of this region.

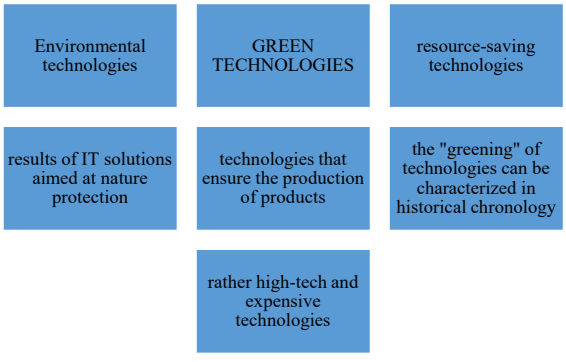

Figure 1. The conceptual apparatus of green technologies.

It should also be said that thanks to the use of green technologies, energy savings occur, as new

Bisultanova, A.
Green Technologies Are the Foundations of the Future.
DOI: 10.5220/0011569200003524
In *Proceedings of the 1st International Conference on Methods, Models, Technologies for Sustainable Development (MMTGE 2022) - Agroclimatic Projects and Carbon Neutrality*, pages 239-243
ISBN: 978-989-758-608-8

devices are being developed that use less energy and fuel for their work.

2 MATERIALS AND METHODS

Achieving the introduction of green technologies into the economy, despite their expensive cost, is a social, political, and economic task for society. The introduction of green technologies will ultimately be able to change society, new business models will be developed, new chains of connections in production that have not been used before will be discovered, consumer behavior in the market will change, the list of preferred goods for a potential buyer will change, appropriate amendments will be made to the legislative and regulatory base. According to numerous studies, without political support, enterprises will not want to stimulate the long-term development of green technologies, as well as consumers of products that are the product of the introduction of green technologies will not want to buy it at a higher price than for a product created without the participation of green technologies. And even in this case, it is not entirely clear whether consumers will want to pay a large amount for a car solely based on the knowledge that the main production process is less carbon-intensive than before (Bisultanova, 2021; Dzhabrailova, 2021; Greening the economy in the Pan-European region, 2014). In addition, the obtained results of fundamental research and development, which seem promising, may not actually turn out to be so rosy. Moreover, the introduction of green technologies is a costly and knowledge-intensive process, which can be a serious obstacle for small and medium-sized enterprises. In total, it is necessary to summarize the fact that the introduction of green technologies is a difficult process to predict, however, it is known for sure that there will be problems in the process of transition to a green economy: firstly, associated with high risk; secondly, associated with high material costs.

In addition, the growing importance of diffuse emissions also requires green innovation in the public sector. In particular, the implementation of environmental regulations requires specific monitoring technologies that can measure pollution levels. The development of new technologies that, for example, facilitate low-cost monitoring of emissions should be encouraged, but it is unclear who has the incentive to promote and conduct such research and development. Similar concerns can be raised about innovations that allow consumers to better assess the environmental footprint of various products and services. Private firms cannot be expected to engage intensively in these types of green innovations. Nevertheless, governments often spend significant amounts to finance research and development in the field of pollution control technologies, but less often it is observed that government programs finance research in the field of technologies that can contribute to policy implementation and environmental monitoring.

3 RESULTS AND DISCUSSION

It is obvious that it is also necessary to improve the system for evaluating the effectiveness of the introduction of green technologies. In the context of increased attention to the role of technology-specific policies, such evaluations are far from unambiguous. They should take into account the role of various policies in innovation systems and take into account the important effects of interaction between the state and the private sector.

The positive power of technology and green thinking is evident all over the world, and the use of green technologies is growing. For example, global investment in renewable energy has been growing for many years, increasing five-fold between 2004-2010, and there has been steady growth since then. A Bloomberg New Energy Finance report for 2018 indicated that investments in clean energy amounted to more than USD 322 billion. If we touch on the advantages that the introduction of green technologies gives to business, it is worth noting that the costs of electricity consumed are reduced; the costs of water consumption are also reduced, for example, some enterprises have reduced water consumption by up to half due to the introduction of green water-saving technologies, such as touch taps; employee productivity increases, for example the account of the approach to maintaining a healthy lifestyle and well-being; gives tax benefits: depending on the implemented technology, there may be tax benefits for green devices. For example, the use of solar panels can give tax benefits, and the sale of solar panels exempts owners from paying income tax. It is also worth noting that the introduction of green economy technologies contributes to the formation of a more prestigious image of the company, confirms the fact that the organization has greater social responsibility.

According to forecasts, the global volume of solar photovoltaic installations will break new records, both in 2022 and in 2023, and next year the annual

market will reach the threshold of 200 gigawatts, boosted by growth in China and India. There are expected to be more solar panels on the roofs of EU homes and businesses as they help consumers save money on rising energy bills.

A 40 percent drop in the growth of new offshore wind capacity worldwide is also expected in 2022, after its growth was caused by a huge jump in China last year, as developers rushed to meet subsidy deadlines. "But global capacity growth this year will still be more than 80% higher than in 2020," the IEA said in a statement. Even despite the slowdown in growth this year, China will surpass Europe by the end of 2022 and become the market with the largest total volume of offshore wind power capacity in the world. Lengthy and complicated procedures for obtaining permits and political uncertainty are hindering the much faster growth of wind energy, according to the IEA.

Most of the technologies under consideration are still at an early stage of development, despite the objective need for their implementation, and only a few large projects are working on a scale close to those required to achieve the company's goals,

The situation with the introduction of green technologies into the Russian economy is as follows.

Now the first national "Green Standards" with an integrated approach to energy efficiency, resource conservation, environmental safety and comfortable conditions of the human environment have come into force in Russia (Green News, www.radidomapro.ru). The main elements of the "Green Standards" can be presented visually in the form of a table.

According to the analysis conducted by the National Research University Higher School of Economics, the following areas have become leaders in the introduction of green economy technologies to improve environmental and resource efficiency in 2021 (Green technologies in the manufacturing industry, 2021):

- energy efficiency improvement (16%);
- efficiency of water and raw materials use (15%);
- reduction of material consumption (14%).

In particular, 13% of enterprises were recorded in the further use of green technologies to increase the efficiency of greenhouse gas emissions and pollutants, and the same proportion of enterprises planned the introduction of digital technologies to create clean and safe energy. Further, according to the outlined industrial development plans in the Russian Federation, 12% of enterprises focused on development in the field of expansion of the electric vehicle fleet and 11% — on the implementation of the transition to renewable energy sources using digital technologies.

Table 1. Green standards from 01.02.2019.

No.	Name	Scope
1.	Green standards. Green technologies of the living environment and green innovative products. Terms and definitions	This standard establishes the main terms and their definitions used in evaluation of products and technologies supplied to the market for compliance with the requirements of green standards
2.	Green standards. Green technologies of the living environment. Classification	This standard applies to green technologies of the life environment and establishes their classification.
3.	Green standards. Green technologies of the living environment. Classification criteria	This standard applies to green technologies of the living environment and establishes criteria for the attribution of technologies of the living environment to green ones.
4.	Green standards. Green technologies of the living environment. Assessment of compliance with the requirements of green standards. General provisions	This standard establishes the general provisions for assessing the compliance of green technologies in the living environment with the requirements of green standards.

In 2020, the leaders in terms of the use of digital technologies to improve energy efficiency in the medium and high-tech segment were the automotive industry (46% of all heads of industry enterprises in Russia noted this direction of development), the production of machinery and equipment (39%) and the production of electrical equipment (33%).

In the low-tech segment, metallurgical production (37%), coke and petroleum products production (29%) and clothing production (24%) were the leaders in this indicator in 2020, while manufacture of leather and related products (10%), production of ready-made metal products (10%), furniture production (7%) lagged behind.

From the point of view of plans for 2022-2023, in the medium and high-tech segment, manufacture of basic pharmaceutical products and pharmaceutical preparations was ahead of the indicator (28%), while in manufacture of machinery and equipment (9%) and manufacture of motor vehicles (7%), such plans were least expressed. In the low-tech segment, the leaders were manufacture of wearing apparel (43%) and furniture (33%), while the production of textiles (7%), coke and petroleum products (3%), leather and leather products (1%) were lagging behind.

4 CONCLUSIONS

Concluding the study, it is worth emphasizing once again the impact of public policy on the effectiveness of the development and implementation of green economy technologies.

It is worth emphasizing that the delay in activating state policy in terms of implementing the principles of the green economy is costly for our planet. Economists have shown, using both theory and data, that policy uncertainty makes this type of innovation less likely (Makarov, 2021; Isachenko, 2015; Krichevsky, 2019). In this regard, it is worth emphasizing that investments in R&D are particularly affected by uncertainty, since the profitability of these investments is sensitive to what is happening with politics. The harmful effects of carbon dioxide concentrations continue, which indicates the need for early decisions, and at all levels of government, starting with the legislative branch. It is necessary to stimulate representatives of science and technology in every possible way so that the process of transition to the "greening" of the economy is accelerated. It is also worth paying close attention to the increase in the level of education in the field of green economy technologies, part of the fact that the transition to green technologies is an objective consequence of the current situation on the planet. It is necessary to introduce into the education system at all levels, starting from school, courses on improving literacy in the field of green technologies. Under the current conditions, everyone should know all the threats and possible disasters in the field of ecology, as well as ways to solve the consequences that have already occurred. Although the current conditions of economic development, the fight against the consequences of the coronacrisis, the increasing complexity of the geopolitical situation in the world, this type of innovation is becoming less likely.

Consequently, the uncertainty of state policy is a factor hindering the development of science and technology, and the country's leadership should immediately raise this issue on the agenda, despite the fact that in the current troubled time of sanctions and economic crisis on a global scale, our nature is still on the verge of an environmental catastrophe and if not ourselves, then no one else can help it.

REFERENCES

Figovsky, O., 2018. Green technologies. Review of new scientific and technical developments. *Scientific and Cultural journal*. 280. 3(336).

Burmatova, O. P., 2021. Green trends of sustainable development of the territory. *Development of territories.* 2(24). pp. 19-25.

UNEP, 2011. Towards a green economy: ways to sustainable development and poverty eradication http://www.unep.org/greeneconomy.

Bisultanova, A. A., 2021. Problems of sustainable development of the socio-ecological-economic system of the country. *AIP Conference Proceedings. 1. S. "I International Conference ASE-I - 2021: Applied Science and Engineering, ASE-I 2021".* p. 050018.

Dzhabrailova, N. D., Lipatova, L. P., Bisultanova, A. A., 2021. Concept of government regulation of the economy for sustainable development. *Research for Development.* pp. 45-54.

Greening the economy in the Pan-European region: progress, priorities, conditions and options Report of the Economic Commission for Europe and the United Nations Environment Programme. Twentieth session Geneva, 28-31 October 2014 The Eighth Ministerial Conference "Environment for Europe": Greening the Economy.

The first national "green standards" have been approved. Green News. – 2019. https://www.radidomapro.ru/ryedktzij/green/green/utverzhdeny-pervyenatzionalignye-zelenye-standar-65463.php.

Green technologies in the manufacturing industry: trends of greentech directions in industries in 2020-2021. Moscow: HSE, 2021. p. 14.

Makarov, I. N., Drobot E. V., Kolesnikov, V. V., Gudovich, G. K., etc. 2021. Green technologies as part of determinant of innovative development of the production system of the economy. *Creative economy.* 15(7). pp. 2777-2790.

Isachenko, T. M., 2015. Experience of Egorova, M. S., Tsubovich, Ya. A. Analysis of the demand for green technologies in Russia. *International Journal of Applied and Fundamental Research.* 5 (2). pp. 305-307.

Krichevsky, G. E., Tkachenko, Y. L., 2019. What are the "Green technologies" guilty of? There should be no monopoly on the formulation of development strategies. *NBICS-Nauka.Technologies.* 3(8). pp. 13-16.