Formation of mechanisms for ensuring the sustainability of industry

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Abstract. The effective use of natural resources for to meet the needs of society and the state economy became relevant in the middle of the last century, when the UN began to hold the first conferences on sustainable development. Today, these issues are shifting to the prism of the efficient use of natural resources and the conservation of ecological diversity for future generations. The work analyzed the indicators on the volume of pollutant emissions, current expenditures for ensuring environmental stability and the share of disturbed lands. Because of the analysis, it was found that not all emissions and waste are effectively disposed of, and land reclamation after mining is only one third. The work presented measures to ensure environmental protection and measures that need to be implemented at the state level. In conclusion, the study presents the main findings and results of the work.

1. Introduction

Industrial production began to develop around the world several hundred years ago, when questions of a favorable human existence, the receipt of goods that made life easier for the population and ensuring the safety of territories came to the fore [1-3]. During this period, mankind did not think that the scale of production can penetrate into all spheres of activity and will fully ensure the socio-economic stability of the regions, human life, military and political security, and contribute to the development of new activities. In this connection, humankind did not think about the problems of rational use of natural resources, conservation of ecological diversity and environmental sustainability for future generations.

In Russia, industrial production began to develop at the end of the 19th century, when the first power plants were being built, a gradual transition from manufactory production to industrial conditions for the functioning of industrial enterprises began. The established industries allowed to increase not only the volume of production of goods and services, but also to increase the level of negative impact on the environment. In the middle of the last century, the main industrial enterprises
were built, which today negatively affect the ecology of certain territories, which requires the economy to timely respond to challenges and develop policies in the field of environmental safety of the national state.

However, they began to think about the need to preserve the environment in the middle of the last century, when the UN conference raised the issue of sustainable development, which has transformed into energy efficiency and environmental conservation for future generations. The decisions adopted extended to all countries of the world and required speedy implementation; it is worth noting that individual countries began to abandon the use of natural resources and began to switch to new technologies, but not all countries complied with the decisions taken [4-6].

In the Soviet Union, UN decisions were implemented, but not fully, for their implementation there were corresponding research institutes and laboratories that could reduce the use of specific types of resources and, as a result, reduce the burden on the environment. Of course, such a trend and the economy’s dependence on the sale of natural resources to foreign markets require the economy to increase their production [7-10].

2. Materials and methods

The aim of the study is the formation of areas that can ensure the environmental stability of Russia. The research objectives are as follows:

- assess the area of used and reclaimed land in the development of mineral deposits;
- suggest environmental activities.

To achieve the objectives of the study, various scientific methods are used in the work. The information base of the study was information from government statistics agencies, analytical materials and corporate reports of organizations.

3. Results

In modern Russia, the level of pollutant emissions increases every year, which is associated not only with the functioning of large industrial enterprises, but also with the formation of additional pollution sources, among which are transport and air means, residential and public buildings. However, despite the trends in the development of economic sectors that affect the environment and ecology, the Russian Federation does not implement programs to develop energy-efficient and environmentally friendly technologies.

In the modern Russian economy, there are many different industries, the result of which is not only the production of products, but also the emission of pollutants [11]. Today in Russia there are the following types of industrial production - this is mining, manufacturing, providing electricity, gas and steam, water supply and elimination of pollution. All these industries use natural resources in their activities, the processing of which produces goods and services. However, these types of industrial activities form the following pollutants (table) [12].

| Table. 2018 pollutant emissions. |
|----------------------------------|
| Production and consumption waste generation, million tons | Mining | Manufacturing | Electricity, gas and steam supply | Water supply and pollution management |
| Utilization and neutralization of production and consumption waste, million tons | 6850 | 244 | 20,1 | 10,6 |
| Discharge of polluted sewage into water bodies, million of cubic meters | 3585 | 128 | 1,7 | 30,5 |
| | 784 | 2258 | 883 | 8124 |
Emissions of air polluting substances from stationary sources, thousand tons

4851
3756
2709
592

Capture of air polluting substances emanating from stationary sources, million tons

1934
23226
15864
130

It can be seen from the table that mining and only half of all waste passes through the disposal and neutralization. The largest volumes of polluted wastewater discharges into water bodies are observed at water supply and elimination of pollution, emissions of pollutants into the air from mining enterprises, and the capture of polluting atmospheric substances is best carried out at manufacturing plants [13-16]. Thus, we see that each area of activity produces its own amount of waste that negatively affects the environment.

Next, we present the current costs of environmental protection (figure 1) [12].

Figure 1. Current expenditures on environmental protection in 2018, million rubles.

It can be seen from the figure that in each field of activity of industrial productions environmental protection costs are directed. At the same time, we see that the distribution of costs is not always proportional to the waste generated.

Consider the volumes of disturbed and reclaimed land during the development of mineral deposits (figure 2) [12].

Figure 2. The area of disturbed waste and reclaimed land during the development of mineral deposits, hectares.
The figure indicates that the volumes of disturbed lands are increasing until 2017, while the volumes of reclaimed land do not increase, and in 2017 and in 2018 only a third of the disturbed lands are reclaimed. Thus, because of the analysis, it was found that not all waste that is emitted by industrial enterprises is disposed of and rendered harmless, and the amount of disturbed soil cover is restored by only a third [17-20].

4. Discussion

Today, a number of companies have already developed many projects and programs, and state, regional and industry institutions - strategies and laws. For example, the following steps have been taken to protect the environment and preserve biodiversity:

- stricter environmental safety requirements;
- energy saving;
- development of equipment for the production of environmentally friendly goods;
- increasing the proportion of reclaimed land [21-22].

In addition, the following measures should be taken to reduce the negative impact on the environment, including:

- development of innovative technologies;
- creation of regional systems for monitoring the level of pollutant emissions into the atmosphere;
- environmental change monitoring;
- stimulation of measures to reduce production waste, pollutant emissions and wastewater discharges;
- improvement of the legislative and regulatory framework;
- increase in the proportion of reclaimed land;
- integration of national environmental indicators into the corporate governance system [23-24].

In order to achieve the objectives it is advisable at the state level to create the following conditions:

- creation of the necessary infrastructure in order to obtain innovative technologies;
- creation of the state information system "Ecology and environmental protection";
- staff development and the creation of special programs for their retraining;
- improving literacy among the population on environmental issues and environmental protection;
- development of conditions for the creation of joint laboratories and research centers with international partners.

Thus, in order to preserve the environment and biological diversity for future generations, corporate structures develop and implement strategies and programs for modernization of capacities.

5. Conclusion

In the presented study, indicators on waste generation, current expenditures on environmental protection and the share of reclaimed land were analyzed. Because of the analysis, it was revealed that the volumes of production and consumption waste generation and atmospheric pollutant emissions are the largest in mining, and the largest discharge of wastewater is carried out in the water supply and waste disposal system, while in the processing system there is a high level of pollution substances. It
was revealed that when mining, only a third of the land used is reclaimed. Based on the analysis, the work proposed measures to preserve the environment and the measures necessary to implement at the state level.

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