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## STATE REGULATION OF MINING AND MINERAL PROCESSING WASTE

**Summary.** This article focuses on the problems of state regulation of mining and mineral processing waste in the Russian Federation, definition of the main causes retraining its involvement in the economic turnover, analyses of foreign experience in mining waste recycling. In the authors' opinion, the government should take effective measures which reduce mining waste production and dumping.

**Keywords:** state regulation, legislation, mining and mineral processing waste, ecological policy.

## UWARUNKOWANIA PRAWNE ZAGOSPODAROWANIA ODPADÓW GÓRNICZYCH I MINERALNYCH

**Streszczenie.** W artykule skoncentrowano się na problemach dotyczących zagospodarowania odpadów powstających przy przetwarzaniu minerałów i produkcji górniczej oraz zdefiniowaniu głównych przyczyn uniemożliwiających ich ekonomiczne wykorzystanie w Federacji Rosyjskiej. W celu określenia działań likwidujących bariery przemysłowego wykorzystania odpadów, w artykule posłużono się analizą zagranicznych doświadczeń w zakresie recyklingu odpadów górniczych. Zdaniem autorów artykułu, rząd Federacji Rosyjskiej powinien skorzystać z tych doświadczeń i podjąć efektywne działania ukierunkowane na zagospodarowanie wytwarzanych i składowanych odpadów górniczych, co umożliwi znaczną redukcję ich ilości oraz zmniejszenie ich szkodliwego oddziaływania na środowisko naturalne.

**Słowa kluczowe:** uwarunkowania prawne, odpady powstające przy przetwarzaniu minerałów i produkcji górniczej, polityka ekologiczna.

## 1. Introduction

Article 1-12 pages – about 20000-30000 characters Traditionally, the ecological and reproduction problems of mining and mineral processing waste are the objects of state policy as well as statutory and regulatory base.

The state ecological policy of Russia is determined in the Constitution of Russian Federation in the Federal act called “Environmental protection act”, “National environmental protection and procuring of sustainable growth strategy of Russian Federation”, «Fundamentals of national ecological development policy of Russian Federation till 2030» and other documents which include the mechanisms of providing the safe treatment concerning waste, particularly: reduction of waste production, its involvement in the repeated economic turnover, termination of waste production, implementation and usage of low-waste and resource-saving technologies. The reproduction aspect of this problem is presented in the following documents: “Strategy of developing geological sector until 2030”, “State policy of usage of minerals”, “Long-term state program of mineral survey and reproduction of Russian mineral base oriented on the usage and reproduction balance”.

The involvement of mining waste in the repeated economic turnover is ineffective in spite of the governmental actions concerning law and high-level knowledge technology, even if the result of waste usage is high. For example, it is known that processing of common mineral waste enables the production with a high added value. In the Leningradskaya region, which is one of the leaders in the production of construction materials, every year more than 6 million tons of waste are gathered caused by processing minerals, what is an equivalent to a loss of income from 80 million to 1,5 billion rubles per year. The present situation in region does not satisfy the state reproduction and ecological policy<sup>1</sup>.

The research objective: to determine of the direction of development methods of state regulation of waste management in Russia based on a comparative analysis of the Russian mining and environmental legislation, taking into account the international experience.

## 2. Research methodology

There are no special statutory and regulatory acts in the Russian legislation which regulate mining and mineral processing waste<sup>2</sup>.

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<sup>1</sup> Nevskaya M.A., Ligozkij D.N.: Organizational and economic problems of rational use of subsoil and their solutions in modern conditions. Notes of the Mining Institute, Vol. 202, Mining University, 2013, p. 78-84.

<sup>2</sup> Seleznev S.G.: Economic and legal aspects of the Russian legislation in the field of mining waste, [in:] Collection of materials of the conference “Problems of mining waste facilities”, Moscow 25-26 April 2013//www.maxconf.ru

That is why now this industry is under the two laws: mining law “Minerals resources law” and ecological law “Environmental protection act”. These two laws contradict each other because:

1. Mining law “Minerals resources law” describes dealing with waste as an activity concerning mineral resources. Consequently, the necessity of licensing and all steps which lead to this appear automatically (such proceedings as geological surveys, registration etc.). In this case big problem is derelict lands and waste – huge collections of man-caused mineral formations which are counted as waste unless somebody takes a commercial interest in them.
2. Right of property to waste is restricted by the right to waste usage because it cannot be transferred to the third person as it is treated as the usage of mineral resources.
3. The law “Mineral resources law” does not contain the definition of “Mining and mineral processing waste” that makes difficult to determinate an object of the activity.

Moreover, the definition of “Mining and mineral processing waste” does not correspond to the definition used in the statistical accounting, where waste is recognized by the kinds of economic activity. It creates contradictions not only between the legal standards but also between the branches of law.

Mining cyclopedia determines mining waste as “out of use mining and mineral processing product received from mined minerals during the process of exploitation, concentrating and processing”<sup>3</sup>.

In the National standard of Russian Federation “waste is residues formed during a process or after accomplishment of this process and not used in this process anymore (art. 3.1)”<sup>4</sup>.

According to the Federal law “Law on production and consumption waste”, production and consumption waste is residues of raw materials, materials, prefabrications, other products created during the process of production and consumption, also the products that have lost their consumptive qualities<sup>5</sup>.

In “Law on production and consumption waste” the right of property to waste is granted during the economic activity, belongs to the economic entity and may be given to other people by an agreement of sale and purchase, exchange, donation or other transactions (art. 3, i.2). According to the concept of reproduction and mining law the main characteristics of mining and mineral processing waste are qualitative and quantitative assays of valuable component.

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<sup>3</sup> Mining cyclopedia: [Electronic source] - access mode /<http://www.mining-enc.ru/o/otxody-gornogo-proizvodstva>

<sup>4</sup> NSS P 53691-2009. National State Standard of Russian Federation. Efficient use of resources. Waste management. Waste passport I - IV class of hazard. Main requirements [Electronic source] - access mode: <http://www.consultant.ru>

<sup>5</sup> Production and consumption waste - Federal law RF, No. 89-FL -24.06.1998. [Electronic source] - access mode: <http://www.consultant.ru>

The existence of potential consumer properties of waste may be considered as “secondary mineral resources” for other industries<sup>6</sup>7, as well as “man-made mineral resources” - additional sources of the replenishment of minerals<sup>8</sup>9.

For example, slag copper smelting plants in the Urals contain more than 110 million tons, what includes more than 350 thousand tons of copper, about 210 thousand tons of zinc, several hundreds tons of sulfur, more than 7 tons of gold, 150 tons of silver and other metals<sup>10</sup>.

Approximately, 67% of the overburden rocks of iron ore deposits can be used for the production of building materials: rubble, cement and ceramic wall materials<sup>11</sup>.

Potential sources of raw materials for the extraction of gold are waste processing plants which process the mineral resources from natural deposits<sup>12</sup>.

To refer to mineral resources contained through the accumulations of waste production, in scientific language more than 40 years, the term "man-caused deposit"<sup>13</sup> may be used, which currently is not a definition in the legal context.

In our opinion, not all waste can be considered as the sources of mineral raw materials: factors limiting the usage of industrial waste as minerals is its volume, presence of harmful contaminants that create hazard to the environment, even if there is a presence of useful components and processing technologies.

For example, in the long-term storage, the useful components contained in waste, get into the environment and pollute it. The risk of the negative impact exists not only at the disposal of toxic waste, but also when storing inert waste<sup>14</sup>.

In addition, the scale and negative environmental impacts of waste accumulation may significantly exceed the demand for it as a resource.

In the concept of ecology, waste criteria are not only the size, but also its kind, type and class of hazard and accordingly, the amount of fee for its placement<sup>15</sup>.

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<sup>6</sup> Berezovsky P.V.: Economic evaluation of secondary mineral resources. St. Petersburg State Mining Institute (Technical University), St. Petersburg, 2006, p. 193.

<sup>7</sup> Chainikov V.V., Goldman E.L.: Valuation of investments in the development of man-made deposits, -M, LLC "Nedra-business centers", 2000, p. 220.

<sup>8</sup> Gorlova O.S.: Man-made mineral deposits. Magnitogorsk: MSTU N. Nosova 2001, p. 77.

<sup>9</sup> Halperin A.M, Kutepov Y.I./Halperin A.M.: The development of man-made arrays in mining enterprises: Monograph M.: Publisher "Mountain Book", 2012, p. 336.

<sup>10</sup> Bykhovskiy L.H., Sporyhina L.C.: Industrial waste as a resource replenishment of the mineral resource base: the state and problems of development/Mineral resources of Russia. Economics and management, No. 4, 2011, p. 19-23.

<sup>11</sup> Komarov M.A., Aleskerov C.A., Kusevic V.I., Saverdun C.L.: Mining and industrial waste - an additional source of raw minerals/Mineral resources of Russia No. 4 2007 [Electronic source] - access mode:/http://www.vipstd.EN/gim/content/view/407/204/

<sup>12</sup> Makarov V.A.: Gold technogenic mineral objects, resources and problems of geological and technological assessment "Gold and technologies" No. 3(13)/ 2011[Electronic source] - access mode:/http://zolteh.ru/index.php?dn=news&to=art&id=375

<sup>13</sup> Troubetzkoy K.N.: Classification of waste deposits, the main categories and concepts/K.N. Troubetzkoy, V.N. Umanets, M.B. Nikitin/Mining Journal, 1989, No. 12, p.6-9.

<sup>14</sup> Seleznev S.G., Stepanov N.A.: Mineral wealth on the surface. Features man-made objects and problems of their development/sustainable development of mineral resources, No. 6, 2012, 15 C.

<sup>15</sup> Mormil S.I., Salnikov C.L., Amosov L.A., Khasanov G.G., Semyachkov A.I., Zobnin B.B., Burmystrenko A.C.: Technogenic deposits of the Middle Urals and evaluation of their impact on the environment (ed. by):

To estimate the opportunities of waste recycling in our country it is also useful to estimate foreign law and experience in this field. Actually, we should describe the following major aspects:

- Establishment of a property right
- Methods of mining waste regulation including the stimulation of its recycling

Waste property right belongs to the one who produced it in most of countries. Exceptions may concern “abandoned” waste. For example, in Canada mining and mineral processing, waste left in tailing dump belongs to its producer only during the one year and then the right is passed to the State, because it is assumed that the renter resigned from it<sup>16</sup>.

In law “Mineral resources and subsurface use of Kazakhstan” of the 24<sup>th</sup> of June 2010 it is determined that man-caused mineral formations are the property of the user of subsurface resources and he can make any actions allowed by the government of the Republic and civil transactions. An exception are man-caused mineral formations accumulated before the 30<sup>th</sup> of May 1992 or included in the state mining resources fund and are national property. The property right to minerals produced by man-caused mineral formations and passed to the government is determined in contract<sup>17</sup>.

To determine the level of state mining waste regulation it was assumed that there is a special connection between the following indexes: the extent of mining and processing mineral resources, correlation between export and import of mineral resources and the methods of state waste regulation.

This assumption was based on the countries where the economy is dependent from import of raw materials and the stimulation methods of complex recycling are more developed in case of limited ecological resources.

As a result of observation of information from the approachable sources the following groups of industrially developed countries were obtained (table 1):

Dependence from import of raw materials is expressed more expressively in the countries of EU, that is why the mechanisms which regulate mining waste recycling are determined in details. Minimal requirements of reduction and prevention from a negative environmental impact of mining waste for the European Union countries are determined in “Directive 2006/21/EC of the European parliament and of the Council of 15 March 2006 on the management of waste from extractive industries and in amending Directive 2004/35/EC”<sup>18</sup>.

Every member may establish its own rules and requirements in the field of waste but in accordance with the objectives of the Community policy on the environment, it is necessary to

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Y.A. Borovkov. – Ekaterinburg: NIA-Priroda, the DPR for the Ural region, geological enterprise "Devon", 2002, p. 206

<sup>16</sup> The Mines and Minerals Act of Canada, p.126(5), 126(6) [Electronic source], access mode: <http://web2.gov.mb.ca/laws/statutes/ccsm/m162e.php>

<sup>17</sup> «Mineral resources and subsurface use of Kazakhstan (with changes and additions in 2014) law of Kazakhstan republic 24th of June 2010» No. 291-IV 11.04, art. 10, p. 3,4,5 [Electronic source], access mode: [http://online.zakon.kz/document/?doc\\_id=30770874](http://online.zakon.kz/document/?doc_id=30770874)

<sup>18</sup> «Russia and world countries» -2012 [Electronic source], access mode: [gks.ru](http://gks.ru), tabl.14.6,14.7

set the minimum requirements in order to prevent or reduce as far as possible any adverse effects on the environment or on human health which are a result of waste management from the extractive industries, such as tailings. For example, Germany as an EU member has to fulfill the European and national obligations what was successfully performed in the German construction industry<sup>19</sup>.

Waste legislation in Finland is mostly based on the European Union legislation but in some cases there are more stringent standards added than in the EU legislation.

In spite of the significant mineral resources potential the USA is committed to the principle of economy and saving mineral resources in its national economic policy (similarly to countries possessing limited mineral resources – Japan, members of the European Union), consumer orientations are directed on cheaper foreign sources of colored, rare, noble metal and purposeful strategic stock formation. The specificity of state waste regulation in Canada and the USA is not only the execution of this legislation but also elaboration and implementation of different ecological and environmental protection programs.

Table 1

Groups of industrial developed countries on the basis: the extent of mining and processing mineral in the GDP (Gross Domestic Product) structure, extent of export and import of raw materials and fuel in the structure of commodity balance

Country	Extent of mining and processing mineral in the structure %	Export of raw materials (fuel); import of raw materials (fuel);
Russia	10,9 (15,2)	72,7 (69,1); 5,1 (1,6)
Kazakhstan	20 (11,7)	77,2 (71,7); 11,7( 9,9)
European Union (Great Britain, France, Germany)	1,2 (25,8)	15,3 (12,7); 14,3 (11,3) 6,3; 16,7 (13,8) 3,9; 15,6 (11,4)
The USA	3,2 (20,7)	13,0 (6,3); 20,2(18,4)
Canada	4,0 (18,0)	33,0 (23,7); 13,0(10)
Australia	10,0 (9,0)	61,3 (28,9)
<i>Important: in the structure of export and import in Russian dates "raw materials" includes "non-food, except fuel, adipose and vegetable oil".</i>		

Source: Directive 2006/21/EC of the European parliament and of the Council of 15 March 2006 on the management of waste from extractive industries and amending Directive 2004/35/EU/Strasbourg, 15th of March 2006 [Electronic source] - access mode: //www.consultant.ru; . Reinhard Fischer, Mineral Construction and Demolition Waste in Germany: potentials for reuse and recycling in various sectors, 2010, [Electronic source] - access mode: <http://www.sweep-net.org/?q=node/711>

<sup>19</sup> Kalabekov I.G.: Russian reforms in figures and facts (The second publication, reworked and enlarged edition). M.: RUSAKI, 2010, 290-293.

Among all the aforementioned industrially developed countries Australia is the world's largest mineral resources exporter. Despite all the developed waste legislation problem of waste reduction is considered to be the problem of national policy and accepted in the National Waste Policy in November 2009 up to 2020: Less waste, more resources.

The stimulating actions play a significant role in the foreign experience of mining waste recycling. Particularly, in Great Britain wastes which were not processed and have their primary natural structure are tax free. They are meant for stimulation of commercial activity for waste recycling<sup>20</sup>.

The foreign experience of industrial countries concerning the developed market economy shows that for them as well as for Russia the government regulation in the field of environmental protection plays a very important role. Ecological policy in foreign countries as well as in Russia provides directions of reduction of waste creation, integrated usage of mineral resources, decrease of danger and risk of waste dumping. The ecological and environmental protection legislation contains a complex of instruments and methods helping to increase the responsibility for spoiling the environment and to stimulate waste involvement in the repeated economic turnover.

However, the particular law methods are designated by the position and concern of mineral resources in the national economy.

In most of countries state regulation in the field of mining and processing mineral waste is provided by:

- Property right to waste which determine the extent of responsibility for its formation and usage;
- Active policy of efficient use of resources and energy efficiency;
- There must be the individual statutory and regulatory acts which regulate mining and processing mineral waste;
- Strong interrelation between national and region regulatory agencies, delegating responsibilities for minerals waste regulation in terms of location;
- Access to information about producing of waste;
- Stimulating economic methods and strong administrative enforcement for breach of legislation;

There are more developed mechanisms for regulation of mining waste in the countries where the mining and production level is lower than the processing level what helps to produce with less ecological damage.

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<sup>20</sup> Landfill Tax of Great Britain, [Electronic source]-access mode: <http://www.legislation.gov.uk>

### 3. Results

The analysis of legislative framework provided an opportunity to divide the main acts according to three criteria:

1. Legal acts which determinate the general conceptions, policy and state mechanisms of regulation of mining and mineral processing waste.
2. Legal acts which regulate mining and mineral processing waste activity.
3. Secondary legislations which form a complex of instruments and methods for waste regulation (Fig.).

Consequently, the current law and statutory and regulatory system in Russia is applied to general waste, particularly to mining and mineral processing waste, determines the implementation and methods of state regulation in the sphere of reproduction of the mineral resource base, environmental protection and environmental safety.



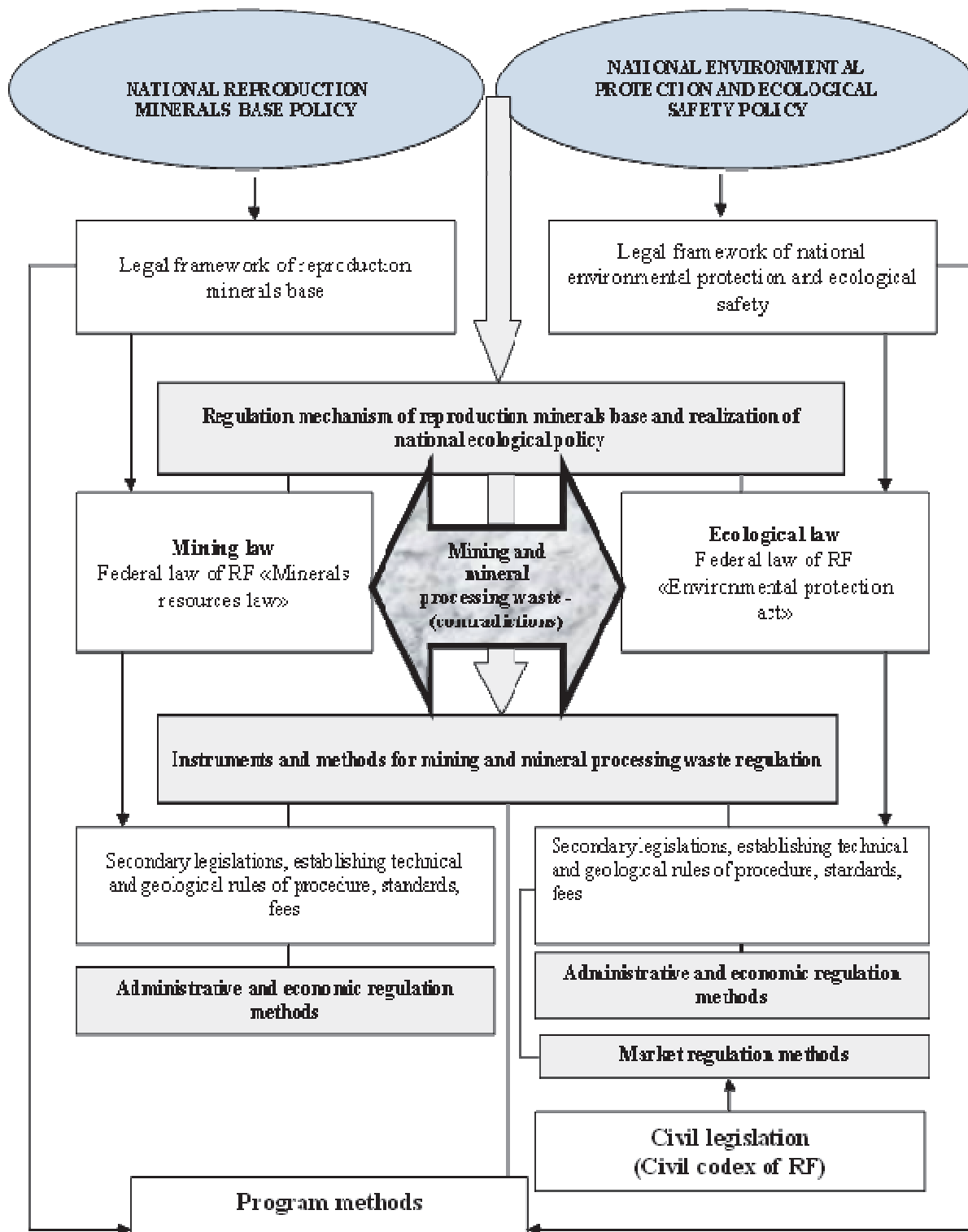


Fig. 1. Scheme formation of instruments and methods of state regulation of mining and mineral processing waste by statutory and regulatory base

Rys. 1. Schemat tworzenia instrumentów i metod państwowych regulacji w zakresie przetwarzania odpadów mineralnych i górnictwach

## 4. Conclusion

Our research shows that the contradictions between the Mining and Ecological law in the field of mining waste are the main reason of low efficiency of the state regulation methods.

That is why for liquidation of these contradictions we propose:

Firstly, determining the definition of “mining and processing waste” and determining the right of possession, use, and disposal of these resources without the additional licensing arrangements.

Secondly, the qualification activity of usage mining and processing waste as a specific kind of activity in the field of mining and processing waste where civil legislation must be in force too. In this case it makes sense to draft an individual legislation in the field of mining and processing waste.

Thirdly, to save our strategic sources of minerals we need to revise the law “Mineral resources law” where the property right belongs to the government.

Fourthly, the property right of abandoned waste must be assigned to the government and its destination should be determined according to the potential significance and potential damage, consequently, it is necessary to formulate the estimation methods of these categories. The regulation methods have to work in such way that it would stimulate the reduction of mineral waste formation at early stages of exploitation, prevent its huge concentration, in other words, involvement it in the repeated economic turnover should take place. This requires:

1. Advancing the quality of technical and ecological project expertise of deposit exploitation on the basis of implementation of the top-of-the-line and accessible technologies which must be taken into account in a system of resources and ecological fees.
2. Strengthening the stimulating function (with both positive and negative motivation instruments) of resources and ecological taxes and fees for what the methods of economic valuation of resources and mining waste damage need to be improved.
3. Providing transparency and accessibility for such government regulation instruments as concessional taxation, investment tax credit and others.

The methods of attraction of small and medium enterprises that possess high performance technologies in the field of waste recycling are necessary to solve the problem of mineral waste. The solution may be found in the program methods as well as in business facilitation: access to the existing waste, information, investment resources, concessional lending.

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## Omówienie

Niska skuteczność regulacji prawnych w zakresie przetwarzania odpadów z surowców mineralnych w Federacji Rosyjskiej jest spowodowana przede wszystkim sprzecznościami pomiędzy normami zawartymi w Prawie górniczym i ekologicznym. Brak definicji prawnych, a tym samym nieokreślony status prawny odpadów nie pozwalają na ich zagospodarowanie i wykorzystanie w obrocie gospodarczym, co negatywnie oddziałuje na środowisko naturalne. W celu rozwiązania tych sprzeczności oraz uzupełnienia istniejących braków legislacyjnych zaleca się przeanalizowanie pozytywnych doświadczeń innych krajów, w których zagospodarowanie odpadów górniczych i mineralnych jest z powodzeniem łączone z polityką efektywnego wykorzystywania zasobów. Proces ten ułatwia tam także współpraca przedsiębiorstw z władzami lokalnymi i centralnymi, wykorzystanie motywatorów ekonomicznych i stosowanie surowych kar administracyjnych za złamanie norm środowiskowych.