

Legislative Regulation of Waste Management System Development in Russian Federation

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Abstract

Currently, environmental pollution by production and consumption wastes is a particularly urgent. It is necessary to increase the volume of processing and to use non-waste production. The state regulates the waste management system using environmental legislation. In Russia, the extended manufacturers' responsibility is implemented; the environmental fee is the main method of state regulation of processing and disposal of waste. There is a positive trend, but problems remain that need further solutions. The main problem is the lack of municipal solid waste collection and sorting infrastructure, which needs to be regulated and stimulated at the legislative level.

Keywords: waste management, legislative regulation, best available technologies, extended responsibility of manufacturer.

I. INTRODUCTION

Currently, a particularly urgent is the problem of environmental pollution, including waste production. A well-known example is the "Great Pacific garbage spot". More than 3.5 million tons of solid waste is produced every day in the world. Russia has accumulated more than 80 billion tons of solid waste, including toxic waste. Every year the area of landfills increases, as the volume of processing does not exceed 60% (Table 1).

Table 1: Share of use and disposal of production and consumption wastes [1, 2].

Year	Share, %
2014	46
2015	53
2016	60
2017	52

Until 2017, there is a positive trend, followed by a decrease in the share of use and disposal of production and consumption waste, which is caused by an increase in waste generation by more than 10% (6.22 billion tons), with the remaining volumes of processing.

Waste is divided into household (solid waste) and industrial. Solid household waste is divided into paper, textiles, glass, food residues, polymers, rubber, and metal. Industrial waste is divided according to the aggregate state, sources of formation,

the possibility of further use, hazardous qualities and properties of work. Depending on the type of waste there are different ways of using waste:

- pyrolysis (exposure to high temperatures in an oxygen-free environment);
- combustion (under different thermal conditions);
- composting (aerobic and anaerobic);
- use in production (recycling).

The main task of waste management system regulation is to increase the volume of waste processing, in other words - their use in production. The implementation of this task is possible through recycling, as well as through the use of modern technologies of waste-free production. Integrated waste processing requires, in its turn, the development of infrastructure for the collection, sorting and processing of industrial and household waste.

II. BASIC PRINCIPLES FOR WASTE MANAGEMENT

The leader in the processing of household waste is Sweden, Sweden also occupies the first place in the world in the production of energy from waste. In Japan, difficult-to-recycle industrial waste is used as a building material. In Germany, a closed-loop system has been introduced, manufacturers are required to lay the waste disposal system at the design stage. Foreign experience demonstrates the systematic nature of waste management, which is regulated at the legislative level.

In the United States, the recycling of waste is one of the mechanisms of resource saving. In Sweden, the state regulation of the waste management system is carried out through the introduction of taxes and duties with simultaneous financial support to enterprises. In France, there is also a system of additional taxation of producers.

European waste management legislation is based on the following basic principles:

- gradual implementation of the "Zero-Waste" principle;
- use of the Best Available Techniques Not Entailing Excessive Cost (BATNEEC);
- manufacturer's responsibility.

Regulation of the mechanism for waste management is based primarily on economic principles, including through the introduction of standards of extended manufacturers'

responsibility: reducing the amount of waste and their involvement in economic circulation; payment for waste disposal; economic stimulation of activities in the field of waste management [3].

III. LEGISLATIVE REGULATION OF WASTE MANAGEMENT SYSTEM

Currently, the Russian Federation is undergoing significant changes in environmental legislation. Along with the transition to the principles of Best Available Techniques (BAT), the norm for extended liability of manufacturers for the disposal of containers, packaging and products that have lost consumer properties has been introduced.

The amendments to the Federal law "On production and consumption waste" from 2017 introduced the following provisions on extended liability of producers for waste disposal and payment of environmental fees:

- manufacturers, importers of goods (including packaging) are obliged to ensure the disposal of waste from the use of these goods in accordance with the standards of disposal;
- manufacturers, importers of goods that do not provide self-disposal of waste from the use of goods, pay an environmental fee;
- the environmental fee is not paid in respect of goods that are subject to recycling and are exported from the Russian Federation;
- the environmental fee rate is formed on the basis of the average amount of costs for the collection, transportation, processing and disposal of a single product or a unit mass of the product that has lost its consumer properties;
- the environmental fee is calculated by multiplying the environmental fee rate by the weight of the finished product or by the number of units of the finished product to be disposed of, or by the weight of the packaging used for the production of such goods, and by the disposal standard expressed in relative units [3].

The main purpose of the environmental fee is to collect funds that are spent by the regions for the collection, transportation, processing, disposal of waste from the use of goods, as well as for the implementation of engineering surveys, preparation of project documentation and construction of facilities used for processing, recycling, waste disposal facilities.

The extended manufacturers' responsibility was introduced in 2014 [4], the transition period, during which extended manufacturer responsibility is adjusted and gradually increases, is not yet over. Thus, in 2017, a list of packaging, tares and products that have lost their consumer properties was approved [5]. Later this list was clarified, expanded and divided into two sections: "goods" and "packaging".

Waste recycling standards are formed on the basis of the all-Russian classification of products by types of economic activity (Table 2).

Table 2: Recycling standards for a number of product groups and packaging [6].

Name	Recycling standard			
	2017	2018	2019	2020
Wooden tare	5%	10%	15%	20%
Paper, cardboard	20%	25%	35%	45%
Oil products	15%	15%	20%	25%
Tires, tyres	20%	20%	25%	30%
Plastic articles	20%	10%	15%	20%
Metal tare	15%	15%	20%	30%
Computers and peripherals	30%	5%	5%	10%
Batteries	5%	15%	18%	20%

It should be noted that in 2018, the disposal of many goods was not yet mandatory, but then specific standards were introduced, for example, for wires and cables - at least 10% in 2019 and 20% in 2020. The recycling standard for the groups of goods "Corrugated paper and cardboard, corrugated paper and cardboard containers" and "Corrugated cardboard packaging" has grown significantly - 25, 35 and 45% for 2018, 2019 and 2020, respectively. However, for 2018-2020 for a number of positions the recycling standards not only did not increase, but, on the contrary, decreased, which serves as an indicator of a balanced approach to regulation.

At the same time, since 2018, a list of waste types (with the exception of certain items) has been introduced, which include useful components, the disposal of which is prohibited at all (Table 3).

Table 3: List of waste types, disposal of which is prohibited [7]

From January 1st 2018	From January 1st 2019	From January 1st 2021
Scrap and waste of ferrous and non-ferrous metals	Cardboard and paper waste	Components and parts of computers and office equipment
Mercury, mercury-quartz, fluorescent, led lamps	Rubber cameras and tires	Batteries
Mercury-containing waste	Glass and polymer tare and waste	Home appliances

Responsibility for compliance with the recycling standards, lying on the manufacturers and importers of finished goods, including packaging, arises if the manufacturer, the importer sells the goods to the consumer, as a result of consumption of which waste is generated. If the goods are sold to a consumer who uses the goods for the production of other products, as a result of which no waste from the use of the goods is generated, then no responsibility arises.

For example, if the manufacturer of paper products sells it for the production of printed materials, the responsibility of the manufacturer of paper products for the disposal of waste from the use of this product does not arise; if the manufacturer of printed products sells it to the final consumer, he will be responsible for the disposal of waste from the use of goods; the exception in this example is the publication of newspapers, since this product is included in the list of goods that are not subject to the obligation to comply with waste management standards [8].

Self-assurance of compliance with recycling standards is carried out in the following ways:

- by organizing one's own infrastructure for the collection, processing, disposal of waste from the use of goods;
- by signing contracts with the operator on the treatment of solid municipal waste, the regional operator on the treatment of solid municipal waste, with an individual entrepreneur, a legal entity engaged in activities for the collection, transportation, processing, disposal of waste (except for solid municipal waste);
- by creating an Association (Union) of manufacturers, importers of goods.
- The obligation of the manufacturer, importer of goods for their disposal is considered fulfilled [9]:
- from the date of reporting on the implementation of standards for waste disposal from the use of goods;
- from the date of the environmental fee payment.

If it is impossible to ensure compliance with recycling standards, legal entities are required to pay an environmental fee, the rates of which are approved by the Government of the Russian Federation in 2016 (Table 4). Environmental fee rates for manufacturers, importers of goods subject to extended manufacturer's responsibility were initially adopted for 36 groups, and then the list was expanded to 54 groups [10].

Table 4: Hazard class and environmental collection rates for some types of waste [11].

Name	Fee rate RUR/t	Hazard class
Wooden tare	3 066	5
Paper, cardboard	2 378	5-4
Oil products	3 431	3-4
Tires, tyres	7 109	4
Polymer package	3 844	4
Metal tare	2 423	4-5
Computers and peripherals	26 469	4
Batteries	33 476	2

IV. DEVELOPMENT OF WASTE MANAGEMENT SYSTEM

As mentioned above, the development of waste processing infrastructure is carried out at the expense of environmental collection. Thus, in 2017, 23 facilities were built, by 2024 it is planned to create 200 facilities for sorting, processing and recycling of waste.

As a result of the development of the waste management system as part of the obligation to dispose of goods and packaging for 2017, the companies processed more than 700 million tons of waste, saving 2.29 billion rubles on environmental fee. At the same time, budget revenues in the form of an environmental fee amounted to 1.33 billion rubles, which was paid to 58% of organizations [12].

In 2018, revenues from the environmental fee amounted to more than 2.5 billion rubles. The percentage of companies that prefer an environmental fee for waste processing is so high because of the "availability" (rather low) rates of this fee. The result of this choice is a reduction in the disposal of paper and cardboard waste by more than 3 times, waste from polymers by 1.7 times, from aluminum by 1.5 times in 2017 compared to 2016 [13]. The under-disposal of existing waste processing facilities by an average of 30% was noted.

The government plans to gradually increase the rates by 2025, while for certain types of waste - in several times. For example, lead-acid batteries by 1250 [14].

By itself, an increase in environmental rates does not seem appropriate [15, 16], since it can lead to an increase in illegal acts of disposal, it is necessary to develop a program for the development of the entire recycling system. It is necessary to invest in the development of the whole "collection-transportation-sorting-processing" chain. Currently, there is a lack of infrastructure for the collection and sorting of production and consumption waste.

Thus, it is possible to note the systematic movement to minimize the disposal of waste, including waste that contains useful components.

V. DISCUSSION

Measures of state regulation of the waste management system today are effective; environmental payments can increase the volume of use and disposal of waste production and consumption, as well as develop regional systems of processing and disposal of waste.

However, today there are the following problems that require further solutions:

- most large companies choose to pay an environmental fee instead of recycling their own waste from goods and packaging;
- the three-fold increase in the number of market players ready to organize recycling is associated with the fact that waste management operators sell recycling acts: which is cheaper than paying an environmental fee by 30–50%;

- the information and technical manuals on the best available technologies do not identify those for a number of wastes, for example, for the disposal of waste oil products [17]; at the same time, compliance with the requirements of the best available technologies for a number of wastes subject to mandatory disposal is difficult;
- the capacities of a number of processing companies are not overloaded due to the availability and ease of payment of the environmental fee;
- the development of waste recycling systems is caused by the lack of infrastructure for waste collection and sorting.

According to the authors, the main problem is the lack of waste collection and sorting infrastructure, which should be given special attention in the territorial schemes of waste management in the framework of an integrated approach. Currently, separate collection of industrial waste is carried out at the production sites of enterprises, the issue of sorting solid domestic waste remains unresolved.

In Russia, there are practically no complexes for sorting municipal solid waste. The most rational is separate waste collection with further manual and mechanical sorting. The widespread implementation of this scheme will significantly reduce the amount of garbage in landfills. At the same time, sorting of municipal solid waste involves the need to emit garbage into different containers, and in the future, separate transportation of these containers to waste sorting sites.

VI. CONCLUSION

It is necessary at the legislative level to regulate the collection and sorting of production and consumption wastes for their further processing, where the main incentive for processing is the economic regulation of waste movement. The development and implementation of this direction will lead to an increase in investment attractiveness and social responsibility in order to develop the waste management system in a whole.

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