Impact of regulatory features on waste management in the Nordic countries

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Abstract. The article discusses the problem of waste management relevant for the Russian Federation and the regions of its Arctic on the example of a number of Arctic states - the countries of Northern Europe. The existing waste management system, features of the relevant regulatory framework and competition development in this area are considered. The legislative framework of waste management in the Nordic countries is heavily influenced by European Union directives and international law. Regulatory documents lay the foundations of management and set goals for prevention of waste generation, reuse, recycling, etc. The Nordic countries have much in common, including cultural and legislative traditions. However, there are significant differences between them, et that is one of the factors explaining the difference in the structure of waste management and the legislative framework in different countries of Northern Europe. Waste management issues have historically been the subject of discussion at the municipal level. Abolition or reduction of state regulation in a number of activities of the sector create opportunities for competition at the waste markets. In most cases, there is an obvious tendency to strengthen market orientation: many municipalities do not collect waste on their own, but use the services of state or private specialized enterprises. In most Nordic countries, existing laws and other regulations to some extent limit competition in waste management. It imposes obligations, but, at the same time, provides broad waste management rights. Within the current legislative framework, there are opportunities to increase competition in the field of waste management, for example, when the municipality decides to promote creation of a market through a tender. However, the existing regulatory framework may not be enough to improve the market structure or create new waste markets. In general, one can talk about development of competition in the field of waste management in the Nordic countries. Market relations create favorable conditions for making innovative decisions that will help reducing costs, decreasing lack of resources, and ensuring efficiency of the waste management sector as a whole. In addition, new solutions and some flexibility in a competitive environment can make a positive contribution to solving environmental problems.

1. Introduction

The essence of the concept of a circular economy is in maximally efficient use of resources. Reform of the production and consumption waste management industry in Russia began in December 2014 with the introduction of amendments and additions to the federal legislation [1]. After several years, both small achievements and significant shortcomings in federal and regional legislations can be confirmed. Of the positive trends, one can note development of the secondary raw materials market, the system of separate household waste collection, and actualization of the garbage problem among population, etc.
The reform itself though goes on with many difficulties, slowly, through trial and error, sometimes resistance and even sabotage from actors of these public rights, including local authorities and unscrupulous business.

The history of waste management can be divided into three main stages. At the first stage, waste was considered a sanitary problem, at the second - a spatial problem, and at the third and current stage, waste is also considered an environmental problem. Waste, as a problem, requires managerial decisions, this is reflected in the regulatory framework and the role of various parties in this sector, and not least, in the creation of exclusive rights. The competition authorities of the Nordic countries argue that the efficient use of society’s resources - that is, minimizing the cost of collecting and maximizing the cost of waste as a resource, limited by environmental goals and current legislation - requires a transition to the fourth stage. At this stage, the role of government operators shifts from waste management to waste market management. In the short term, this implies a different approach to waste management by regulatory authorities, municipalities, industries and consumers. In the long run, this also requires creation of a regulatory framework conducive to the successful passage of the fourth stage.

In recent decades, competition for raw materials has increased; this was in particular caused by rapid growth in developing economies such as China, Brazil, South Africa and India. Increasing pressure on resources and continuing global population growth are a problem for the global economy, and not only for environmental reasons. In the countries of the European Union and the European Economic Area (EEA), the problem is aggravated by the aging of the population, which means that the long-term well-being of their citizens depends on their ability to solve the problem of the growing pressure on production factors. The long-term increase in demand for primary materials is also associated with an increase in demand for secondary materials.

Under such circumstances, the reuse and recycling of materials becomes a key element in maintaining economic growth and competitiveness in trade, taking into account environmental issues. In accordance with this point of view, the lack of reuse and recycling is considered not only as an environmental problem, but also as an inefficient use of resources. This reflects the concept of a circular economy - the transition from a linear economy of “take, produce, consume and dispose of” to an economy of “reuse, recovery and disposal” [2], [3]. The European Union has proclaimed the circular economy one of the main policy objectives and adopted a package of documents consisting of an action plan and legislative proposals. Successful achieving environmental goals and meeting future resource requirements in some cases requires a change in policy and new approaches from decision makers. Competition is a proven mechanism for creating innovations and increasing efficiency, so it is advisable to develop it in the waste management markets. With the increasing use of market tools in waste management issues, it is quite natural that the competition authorities show an increased interest in this area. Competition development seems to be good way to increase the efficiency of waste management.

2. Regulatory framework for waste management in the Nordic countries

The regulatory framework governing the waste management sector in the Nordic countries is significantly influenced by EU directives and international law. In most cases, it is in them that the foundations of legislation are laid out, for this reason the states have a certain freedom of action in forming their national legislations on the basis of these directives. The directives, in particular, provide principles and goals for prevention of waste generation, reuse, therefore, EU Member States and EEA countries have the opportunity to achieve these goals in various ways. This is one of the factors explaining the differences in the legislative framework and the waste management structures in the Nordic countries [4].

EU legislation focuses on protection of health and the environment, and most of its goals and objectives relate to prevention of waste generation and the efficient management of waste. Significantly less attention is paid in the legal documents to the role of each of the parties involved in waste management, that is, to those who have the right to provide services and whether a competitive market exists.
The waste management system in most of the Nordic countries - Denmark, Finland, Iceland, Norway and Sweden - is largely comparable. All countries are participants of the domestic market, being either members of the EU, or through the agreement on the EEA. Therefore, all these countries are subject to the same EU waste legislation. The Nordic countries also have a long tradition of cooperation and interact on issues of policy and legislation, which in many cases are very similar. However, there are some notable differences, for example, the concept of “waste” is interpreted differently, and the exclusive rights enjoyed by municipalities cover different sectors of the waste management market.

According to Articles 28-29 of the Directive of the European Parliament and the Council of the European Union 2008/98 / EC of November 19, 2008 “On Waste and the Abolition of a Number of Directives” - a normative act that governs collection, processing and disposal of waste on the territory of the European Union, the member states should publish national waste management and prevention plans. The Nordic countries publish such plans, both nationally and regionally. Waste management plans establish the goals of national and regional authorities regarding waste management. Plans are usually prepared for the next 10 years and are evaluated every six years. For this reason, plans are an important starting point when it comes to legislation governing the scope of waste management and the possibility to increase competition in this sector [5].

The legislation of the Nordic countries includes both quantitative and qualitative goals and objectives, taken from the current legislation of the European Union. At the same time, EU member states are free in their decisions to tighten their goals, which is often reflected in national waste management plans. For example, in Iceland, the goal is to reduce the amount of waste stored in landfills to less than 5% of their total volume. These supporting goals are usually strategic and not legally binding.

As it was mentioned the waste management systems in the Nordic countries are comparable, but there are differences between them, including what is meant by “waste”. For example, in Denmark, Iceland and Norway, waste is determined by source rather than by form. In these countries, municipal waste is defined as waste generated by households. At the same time, in Finland, municipal waste is “waste generated in permanent dwellings and other types of housing, including the contents of cesspools and septic tanks, as well as waste that is comparable in nature to household waste generated as a result of administrative, industrial and service activities”. In Sweden, municipal waste is defined as “household waste and similar waste”.

In the Nordic countries, it is the responsibility of municipalities to cover different segments of the waste management market. The responsibility of municipalities extends to household waste; they control their collection and further disposal, though do it in different ways. In Denmark, each municipality is also responsible for disposal of waste generated by companies, in terms of their incineration and storage. In Sweden, each municipality independently decides which waste is considered to be “waste similar to household waste”. In Finland, the municipality can either decide to collect municipal waste on its own, or leave the collection organization to property owners [6].

Participation of private enterprises in waste management is different in each of the Nordic countries. In most cases, competition is free when it comes to collection and further management of industrial waste, but this does not apply to municipal waste. In Iceland, in almost all cases, municipalities pay for household waste collection services. In Finland, cases of free competition are observed in the household waste collection market, i.e. waste collection is organized by the owners, not the municipality. In Sweden, in many cases, municipalities are part of open market of municipal waste management. In Denmark household, combustible and landfill waste is often collected by municipalities using the services of private enterprises. Some municipal or inter-municipal waste management companies in Norway purchase part of services from private enterprises. In other cases, Norwegian municipalities purchase services directly from public or private enterprises [7].

One of the similarities between the Nordic systems is the structure of payment for services provided by the state. The Swedish “Local Government Act” states that municipalities cannot charge higher fees than those that correspond to the cost of services or goods provided by the municipality. According to the Icelandic “fee for services” provisions, fees charged by municipalities for waste management should
never exceed the cost of providing the service. According to the Finnish “Law on Wastes”, the municipality must charge the waste management fee that it organizes to cover any costs that it incurs in solving this problem. Reasonable return on capital can be set as part of the waste fee in Finland. In Norway waste management fees charged by municipalities should reflect the cost of disposal, as municipalities should not be able to use their natural monopolies. However, such a fee structure does not guarantee any correction of possible deficiencies in the activities of municipal systems [8].

3. The waste management system in the Nordic countries

In the countries of Northern Europe in the field of waste management there are national administrative bodies - environmental agencies. An environment protection agency in each country is the main sectoral regulator with legislative oversight and monitoring functions. Agencies are responsible for ensuring compliance with waste management rules. They are also tasked with developing and proposing solutions in the field of waste management. In addition, they are responsible for ensuring that waste management is environmentally sound, efficient and simplified for the consumer. Most of the management functions in the countries under consideration are delegated to municipal authorities or other local authorities, but environmental protection agencies have, among other things, the authority to develop regulations and instructions. Their role is to promote sustainable use of natural resources, protect the environment and public welfare, by ensuring a healthy environment and safety of consumer goods. National environmental agencies issue permits to enterprises for waste management. Typically, environmental agency permits relate to large facilities such as landfills and incinerators, as well as facilities that manage hazardous waste. In addition to environmental agencies in the Nordic countries, a number of Ministries and other competent authorities deal with waste management issues [9].

Municipalities in these countries play a central role in organizing waste management. Typically, this role is part of their functions in accordance with the law on municipalities and the regulations governing waste management. This role extends to waste for which municipalities have an exclusive right, usually household waste. In some cases, the organizational and managerial role of municipalities also extends to other types of waste, such as waste from businesses. Municipalities in Iceland can establish local waste management rules, for example, oblige residents and businesses to sort waste at a collection point. In some other countries, municipalities also, to some extent, are involved in determining what constitutes waste. In Sweden, each municipality decides which waste is considered similar to household waste. In some cases, this creates problems, as municipalities interpret the definition of “waste” differently, which, in turn, can cause them to intentionally scale up their exclusive rights.

In the Nordic countries, municipalities are either obliged to draw up waste management plans, or their actions in this direction are encouraged. One of the main objectives of such a local plan is to achieve the goals of the national waste management plan. Municipal and regional governments are also responsible for local planning. If a public or private enterprise wants to open a waste management facility, such as a landfill, then it needs a building permit from the municipality. In many cases, a special permit is also required for operation of waste management facilities. However, municipalities are not always ready to issue permits for waste management facilities, especially when it comes to new landfills. The reason, in most cases, is the potential impact of such facilities on the environment. In addition, it is a barrier to entry into the waste management market.

In some cases, municipal authorities have the right to independently monitor waste management operations. In Iceland, local health authorities issue permits to waste management companies to control their actions themselves. In Norway, municipalities must control handling of waste generated by industrial enterprises, but similar to household waste.

Both private and state-owned waste management companies in the Nordic countries are allowed to operate transshipment and sorting stations, landfills, incinerators, processing plants and other waste management facilities that accept the same or similar types of waste. Therefore, municipalities or municipal enterprises in many cases are direct or indirect competitors to private enterprises operating in this field. In Norway, some municipal companies compete to obtain municipal waste contracts in other municipalities. In Sweden, for example, some municipal enterprises are direct competitors at the
industrial waste collection market. Private enterprises in general perceive competition from municipalities as a problem due to two reasons: firstly, because municipalities are occupied at a market where they should not compete at all, and secondly, municipalities have several advantages as competitors [10].

4. The role of waste management services’ consumers
For households and companies, waste disposal is a service that must be guaranteed under all circumstances. Many consumers are environmentally conscious and undertake waste sorting efforts. At the same time, municipalities’ exclusive right for household waste limits the ability of consumers to participate in waste management. Enterprises in the Nordic countries mainly use recycling services provided by private enterprises. This is especially true for waste collection. In some cases, enterprises send their waste to sorting yards which are managed by municipal authorities or private enterprises. Over the past two decades, the initiative to increase processing has in many cases come from private enterprises. One of the main reasons for this situation is that a conscientious attitude to environmental issues helps to strengthen public relations and create a positive image of the company. Sorting valuable recyclable materials from other waste is also a possible factor for reducing costs.

In some cases, expanding recycling and sorting waste into fractions directly at the source is legally binding. National laws or local regulations may require waste be sorted in a certain environmentally friendly way, for example, paper and cardboard, plastic and metals are separated into separate fractions. In other cases, public or private waste management companies welcome separate waste collection. Municipalities in most countries of Northern Europe can use differentiated tariffs to stimulate behavior aimed at achieving specific environmental goals. For example, in some municipalities, weighted tariffs are used to collect household waste. In addition, there are other forms of incentive for sorting and disposal of waste; fees can be determined depending on the size of containers and frequency of collection or whether food waste is sorted separately [11].

5. Private enterprises dealing with waste management
As a result of the fact that, as mentioned above, municipalities in the Nordic countries are the owners of exclusive rights in relation to municipal solid waste, private entrepreneurs are allowed to offer household waste collection services to households only if they act as contractors of the municipality. Private waste collection companies really compete for the right to sign contracts with municipalities that decide to outsource this part of their waste management activities. However, there are exceptions, for example, the only municipality in Iceland that collects waste on its own is the city of Reykjavik, which today is the largest municipality in the country. Municipalities also transfer rights not only to waste collection, but also to provide other waste management services to private enterprises, although to a lesser extent.

As for waste of companies similar to household waste and industrial waste, here private enterprises can more freely offer their services in competition with state enterprises, they are limited only by the requirements of legislation in the field of environmental protection. In the Nordic countries, private waste management enterprises carry out most of the work of collecting municipal waste from organizations and industrial waste. Private enterprises have the right to operate waste management facilities, for example, collection and sorting yards, and, in most cases, they are allowed to manage waste storage facilities - landfills and incinerators. Most private waste management companies that offer a wide range of services for their own and operating sorting and transshipment yards, as a rule, also provide waste collection services [12].

6. Conclusion
Currently, the problem of transforming the legislative framework and the existing structure of waste management in connection with the need for a transition to a circular economy is very relevant. The problem is not limited solely to waste management issues. Policies and legislation related to taxation, environmental protection, research and innovation are just a few examples of relevant areas that can provide the necessary basis for a waste management system in a circular economy. The existing waste
management system itself must also adapt to a new role in a circular economy, and the institutional infrastructure is likely to undergo significant reforms. However, it is necessary to understand exactly what kind of transformations are needed, how to involve markets and competition in solving existing problems, as well as how managerial structures are ready for the inevitable transition to a new stage.

One way or another, the transformation of waste management implies that even less waste will be disposed of at landfills that could potentially become obsolete, since the materials stored there can again be destined for processing, reuse, and recycling. For this reason, sorting should be further developed both at sources of waste generation and at sorting yards. Another area of transformation is the transition from waste incineration to its processing for reuse and recycling. For an efficient use of previously untested processing capabilities for reuse and recycling, it is necessary to ensure guaranteed and continuous access to the waste materials themselves, which requires the conclusion of appropriate agreements with the owners of the waste.

Moreover, it is likely that both demand and supply of different fractions of waste will vary. This may lead to the necessity of sorting waste at the source and transporting it to specialized processing yards. It is also necessary to develop sorting of waste after collection so that more materials and substances can be sent to specialized points for subsequent reuse and recycling. From a public policy perspective, it is important to keep the market as open and neutral as possible for entry, innovation and new solutions. Since new forms of treatment, reuse, and recycling are likely to occur, waste owners should be prepared to decide who should be the recipient of their waste.

An important aspect of future development is the minimum efficient scale that characterizes the new waste management facilities. The more significant economies of scale are, the more likely a gradual rational transition to new conditions is. Otherwise, the future development of municipal waste management will be subject to some kind of inconsistent action, and additional efforts will be required to achieve these goals. Most likely, it is necessary to adjust the current structure of waste management in order to facilitate its transformation into a circular economy. One of the problems that must be properly addressed is the need to stimulate long-term investment in infrastructure, as well as the possibility of using new and innovative ways of disposing of waste. Competition for agreements with waste owners should be possible, and ensuring the availability and maintenance of the necessary backup infrastructure should be guaranteed in ways other than exclusive rights, as is now happening with municipalities.

Waste management in a circular economy implies market activities and a competitive industry. Competition for waste as resources can make it available for new uses. Well-functioning markets and competition are important in a circular economy, even in the institutional structure of ambitious environmental regulation and public policy. Moreover, the concept of a circular economy also implies a shift from the concept of waste management to the concept of waste market management by the authorities.

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