On the development of an innovative type of entrepreneurship in the field of waste in Kazakhstan

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Abstract

The purpose of the research is to analyze the opportunities for the development of innovative business in the field of waste management as a promising direction of Kazakhstan's transition to a Green Economy. The research methodology is based on comprehensive analysis of the waste management sphere to identify the potential for the development of a Green Business. The study revealed that the existing business models and waste management system are inefficient. Certain measures stimulating the waste recycling business, which will contribute to the "greening" of the economy of Kazakhstan were suggested. The originality of the research lies in the fact that an innovative approach to the development of entrepreneurship in the waste management field is scientifically justified. Using the example of foreign experience in waste disposal, the expediency of recycling and recycling of waste to obtain specific types of finished products are clearly shown. The results obtained can be used in the development of regulatory documents on the problems of waste management, measures to support small and medium-sized businesses in this area; in the practical activities of government agencies and entrepreneurs; in the educational process when teaching the disciplines of Green Economy, Green Business. Therefore, it is necessary to strengthen state regulation of the sphere of industrial and household waste, create conditions for the

development of waste disposal and recycling business and the use of new business models in the activities of waste recycling enterprises.

Keywords: Green Economy, circular economy, solid household waste, municipal waste, industrial waste, waste recycling, Green Business.

Introduction

In modern conditions, all countries of the world are looking for new models of economic development that will allow finding solutions to a number of issues (environmental, food, financial, economic, climatic). Scientific research and experience of developed countries in Asia (South Korea, Japan, China), Europe (EU countries), and America (USA) have shown that in order to achieve stable economic growth, increase incomes and employment while preserving natural capital, ecosystems, and biodiversity, a course towards the Green Economy and sustainable development is necessary.

Sustainable development presupposes such a model of socio-economic development, "in which the satisfaction of the vital needs of the current generation of people is achieved without future generations being deprived of such an opportunity due to the exhaustion of natural resources and environmental degradation" (UNEP, 2011). The essence of sustainability is to achieve harmony between economic growth, social stability, and ecological balance in any state, regardless of the level of its economic development. According to scientists, the concept of the Green Economy is designed to promote sustainable growth. In this regard, we quote the statement of the expert on the Green Economy: "only the Green economy is able to stabilize economic systems and balance the interests of man, nature, and the efficient use of resources" (Kennett, 2010). The goal of the Green economy is to use sustainable production methods, obtain more products and provide more services, along with reducing the number of resources used and waste generated, and pollution (Lipina et al., 2016).

As for Kazakhstan, the modern economy of the country is unstable, since its growth is achieved through the extraction of oil, gas, and solid minerals, which depend on

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the conjuncture of the world market of raw materials. At the same time, the country's extractive industries negatively affect the environment, cause deterioration of the ecological situation and increase in production and consumption waste. For Sustainable Economic Growth, the Concept of Transition of the Republic of Kazakhstan to the Green Economy was adopted in 2013. However, a radical change in the current situation in the country has not yet occurred. In the world ranking according to the Green growth index (GGI) in 2019, Kazakhstan was ranked 26th out of 33 Asian countries; according to the environmental efficiency index (EPI) in 2020, it was ranked 85th out of 180 countries. These indicators indicate the need to find ways to effectively implement the Concept of transition to the Green Economy in the Republic of Kazakhstan. In this regard, the problem of this publication is relevant - research of opportunities for the development of innovative business on a circular basis in the field of industrial, municipal and solid household waste for the transition to a green economy.

Literature Review

Among foreign authors, the problems of the Green Economy and waste have been actively investigated.

According to Kudelas et al. (2018), the transition to the Green Economy will increase the well-being of the population and help preserve natural resources and reduce environmental risks. However, to ensure sustainable development, it is necessary to coordinate activities in all spheres of the economy, an active position of the state and regional authorities, as well as the development of an appropriate organizational and economic mechanism.

According to Lin & Wang, (2019), the transition to the Green Economy is relevant for developing countries that have faced complex environmental problems in the process of industrialization. A study of 39 countries showed that Europe is a leader in the accumulation and use of clean technologies in industrial production, Asia is just beginning to use innovation as the main factor of Green Growth, America is using their experience in the development of a green economy. The authors

concluded that innovation and the pursuit of technical leadership are necessary to ensure stable Green Economy Growth.

Capasso M. et al. (2019), identified the driving forces and barriers to Green Growth. The authors came to the following conclusions: 1) green growth requires competencies that will cope with non-standard situations; 2) technological progress should be focused on obtaining environmentally friendly technologies so that investments are not directed to brown technologies in order to make a profit in the shortest possible time; 3) when assessing opportunities for the Green Economy Growth, market failures should be taken into account, structural and transformational systems; 4) it is necessary to pay more attention to multiscale geographical measurements.

Stevenson et al. (2019), notes that despite many competing concepts (sustainable development, Green Economy, Green Growth, social well-being, etc.), there is no common scientific understanding of the combination of economic growth and environmental sustainability. In his article, the author conducted a survey of 173 respondents on sustainable economic development, and identified and analyzed the main areas of international debate and their differences.

According to Khoshnava et al. (2019), the Green Economy is closely linked to sustainable development and can increase the well-being of the population, social justice, while significantly reducing environmental risks. In the study, the authors developed a hybrid methodology using mathematical methods to select the most effective criteria for the Green Economy and sustainable development.

Merino-Saum et al. (2020), note the contradictory nature of the concept of the Green Economy, in connection with which they investigated various definitions of the Green Economy (95) and sustainable development (35). The authors identified the main similarities and differences by encoding descriptive concepts into a numerical format. As a result, they came to the conclusion that the green economy is a more appropriate concept for solving socio-environmental problems.

Nandy et al. (2022), are concerned about the uncontrolled growth of waste in the world and the forecast of their further growth, which negatively affect human health

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and the environment. The authors analyzed the formation of plastic waste, medical and electronic waste, which can create big problems for a sustainable future; as well as ways to dispose of them. To solve these problems, it is proposed to introduce a closed-loop economy using green technologies (Green economy).

Recently, much attention has been paid to the research of processing agricultural and food waste in a closed-cycle economy and their issues. Huiru *et al.* (2019) research the possibility of processing and reuse of organic fertilizers, as well as obtaining energy from biomass. Zhang *et al.* (2020) the problem of reducing food waste, conducted an analysis of the reuse and recycling of food waste efficiency. Wang *et al.* (2021) found that in the food supply chain, the greatest losses and spoilage occur at the stages of production and consumption and proposed a circular model to reduce them. Lu et al. (2022) conducted an analysis of the production, consumption, and processing of food waste for the period from 2008 to 2016 in the EU countries and proposed a new three-stage model to study the impact of food waste processing on the efficiency of agricultural production in the circular economy.

Kharola et al. (2022) investigated the problem of food waste management on the example of India: they evaluated and ranked 30 criteria that lead to the reduction in food waste and found that the best criterion is training producers. The authors concluded that it is better to prevent the formation of waste at the initial stage of the food supply chain than at the final stage.

Kurniawan et al. (2022) analyzed the situation of solid waste management in St. Petersburg, identified problems hindering the reform of the waste management system, and proposed an integrated waste recycling model based on digitalization.

Bin Zhang et al. (2018) researched the impact of the introduction of processing of industrial waste from the chemical industry in China on the financial performance of the corporation and revealed an increase in sales growth for the year.

Correa et al. (2019) conducted research about the possibility to recycle plastic waste and came to the conclusion that polyvinyl chloride waste is potentially suitable for reuse.

A lot of publication activity has been revealed in Russia - 19.5 thousand scientific publications have been identified on the Google Scholar platform. When writing the article, the works of the following authors were used:

According to Ivanova and Levchenko (2017), the Green Economy should be considered in two aspects: 1) as a trend in economic science, involving the simultaneous preservation and development of the biosphere and civilization; 2) as a way of conducting economic activity, which is aimed at improving the well-being of people without risks to the biosphere. The authors identified 7 areas of the Green Economy system and developed recommendations for "greening" the Russian economy.

Osipov and Kozyreva (2018) recommended adopting the best practices of developed countries in Europe and the USA on waste disposal and recycling to solve the problem of garbage in Russia.

Selisheva, (2018) justified the relevance of the transition of the countries of the Eurasian Economic Union (EAEU) to the Green Economy and revealed the features and problems of forming strategies for the transition to a "green" economy in the EAEU. The author notes that to develop a green economy, it is necessary to invest in green technologies.

Patina and Gorbanev (2019) suggested introducing the Green Economy ideas in Russia and CIS countries using foreign experience. The authors consider it necessary to form financing mechanisms for green development, which allows assessing the needs of society in the development of environmental infrastructure, taking into account losses from natural disasters and environmental damage from anthropogenic activities. They note that the transition to a resource-efficient low-carbon economy is at the heart of national environmental management strategies, which does not cover all aspects of the transition to a green economy but contributes to the search for new opportunities for the practical implementation of this concept.

Shamova et al. (2019), based on the analysis of the municipal solid waste (MSW) industry, identified its problems and threats to further development. The authors

concluded that the measures taken to reform the industry will not give the necessary effect, due to the lack of a nationwide waste sorting system. They believe that the absence of government intervention will lead to a decrease in the efficiency of the MSW processing industry - one of the most important elements of the Green Economy of Russia in the near future.

Vega et al. (2020) identified factors affecting the effectiveness of waste recycling projects, developed an organizational and economic model for the implementation of waste recycling processes, and formulated measures to stimulate the development of this area by the state.

Among Kazakh authors, the following can be noted. Kulumbetova (2017) conducted an analysis of unresolved environmental problems in the Republic of Kazakhstan (RK) and identified opportunities and prerequisites for the transition to the Green Economy, as well as problems hindering the development of green business in the country. The author proposed a comprehensive approach to overcome environmental and economic problems in order to successfully transition Kazakhstan to a green economy.

Tlepova and Mukhazhanova, (2017) identified important environmental problems of the Republic of Kazakhstan and priority areas for their solution with the help of the green economy at the first stage, which involves optimizing resource consumption and the development of environmental activities.

Nurseitov et al., (2018) justified the need to introduce the Green Economy in Kazakhstan. The authors analyzed the components of the resource base of Kazakhstan, investigated possible mechanisms and ways of introducing the Green Economy in the country, developed specific recommendations for the development of the Green Economy in Kazakhstan.

Yessirkepova et al., (2018) assessed the current state of the textile industry of the Republic of Kazakhstan from the production waste management perspective, focusing on the possibility of recycling textile industry waste from the perspective of the basic principles of the Green Economy.

Baizholova and Orynkanova, (2019) conducted a comparative analysis of the "green" and "brown" economies, and showed the advantages of a resource-saving model of the economy over an extensive export-raw materials. The authors, based on a SWOT analysis of the development of the Green Economy in Kazakhstan, identified promising areas for further formation of the Green Economy in Kazakhstan.

Laktionova & Iztaeva, (2019) analyzed the current status of the transition to a Green Economy, including the development of renewable energy, green construction, environmentally friendly transport, waste management, sustainable organic agriculture and rational use of water resources. The authors paid attention to the key risks, problems, and obstacles to the development of the Green Economy in Kazakhstan, and also developed recommendations for solving existing problems.

Seidakhmetov et al., (2019) formulated recommendations for the creation of an integrated waste management system in the enterprises of the textile industry of the Republic of Kazakhstan in the transition to the Green Economy.

According to Nurgisaeva et al., (2020), the Green Economy is a tool for achieving the sustainable development goals, while Green Growth is considered as a strategy for the development of the Green Economy. The authors identified common trends in understanding the concept of the Green Economy, Green Growth and sustainable development, and differences in representing the relations of the economy, society, and the environment in terms of the traditional economy and the model of the Green Economy.

In most scientific works, the general issues of the Green Economy (the formation of the theory, the essence, principles, problems), the experience of foreign countries, problems of agriculture, energy efficiency, and renewable energy sources are investigated. However, at the same time, there is not enough attention paid to the analysis of the current state and prospects of such a priority direction of the Concept for the transition of the Republic of Kazakhstan to the Green Economy as waste management.

Research Methodology

The object of the study is the waste sector of the Republic of Kazakhstan, while the subject is organizational and economic relations for the development of Green Business in this area. The literature review was conducted on the following keywords Green Economy and waste in the title, keywords, and annotation of the document in various databases such as Google, Google Scholar, Scopus, https://cyberleninka.ru, https://www.dissercat.com, etc.

The following methods were used in the course of the study: content analysis allowing to systematize scientific research on the Green Economy and waste sphere; analysis and synthesis which allowed to assess the state of the waste sphere and identify problems; comparative analysis of the level of solid waste processing which showed that Kazakhstan lags far behind the leading countries of the world while having the potential in the field of solid waste for development Green Business; graphical and tabular methods made it possible to visualize the results of the study. Moreover, the data of expert assessments, regulatory and policy documents, reporting, and statistical materials were also used.

Findings and Discussion

The Green Economy term first appeared in 1989 in the report for the Government of the United Kingdom "Blueprint for a Green Economy" (Pearce et al., 1989), but the definition and essence of this concept were not disclosed. To date, many different definitions of the Green Economy, which are presented in Table 1, have appeared.

Table 1. Various approaches to the definition of the Green Economy

№	Organization, document	Definition of the Green Economy
1	The concept of Kazakhstan's transition to a	"an economy with a high level of quality of life of the population, careful and rational use of natural resources in the interests of present and future generations in

	"green" economy (Zakon.kz, 2013)	accordance with the international environmental obligations adopted by the country"
2	UNEP (2009)	"These are economic activities related to the production, distribution and consumption of goods and services that lead to an improvement in the well-being of people in the long term, at the same time, without exposing future generations to significant environmental risks and reducing the shortage of environmental resources"
3	UNCTAD (2011)	"it is an economy that seeks long-term social benefits in short-term activities and leads to improved human well-being and reduced inequality without exposing future generations to significant environmental risks and environmental deficits"
4	Coalition for a Green Economy (2012)	"it is a sustainable economy that provides a better quality of life for everyone within environmental constraints"
5	International Chamber of Commerce (2011)	"an economy in which economic growth and environmental responsibility mutually reinforce each other while simultaneously supporting progress and social development"
6	United Nations Division for Sustainable Development (2011)	"a green economy is an economy that focuses on using opportunities to simultaneously advance economic and environmental goals"

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Sources: Zakon.kz (2013), UNEP (2009), UNCTAD (2011), Green Economy coalition (2012), ICC (2011), UNDESA (2011).

In our opinion, the interpretation of the Green Economy in the Kazakh Concept given in Table 1 is generalized and vague; the other definitions of the Green Economy are very similar to the concept of sustainable development (SD) in the corresponding Concept recognized in the world and in Kazakhstan. In accordance with the objectives of our research, the following definition is the most successful: "Green Economy is an economy aimed at preserving the well–being of society through the efficient use of natural resources, as well as ensuring the return of end-use products to the production cycle" (Khamzina et.al., 2015). Thus, the Green Economy is based on closed cycles of resource use, where waste from one production is considered a resource for another. The main criteria for the transition to the Green Economy are the reduction, reuse, and processing of industrial products (Nandy et al., 2022).

Waste management is a priority task of the Concept for the transition of the Republic of Kazakhstan to the Green Economy, according to which by 2030 the share of solid waste processing in the country should be 40% of the total volume of their formation. Experts and the public of the country express concern that by now a large amount of production and consumption waste has been generated in Kazakhstan, which leads to environmental pollution and destruction of natural ecosystems. For example, carbon dioxide emissions from landfills in the republic, according to the International Center for Green Technologies and Investment Projects, reach 5.4 million tons per year. It should be noted that most of the waste without sorting and neutralization is simply transported to open landfills, 97% of which do not meet sanitary and environmental requirements. Along with this, in 2020, 8884 spontaneous garbage dumps were detected in the country with the help of space monitoring.

This negatively affects the health of the country's population, causing serious diseases, including cancer. In addition, when waste is generated, there is a significant loss of both material and energy resources of the republic.

The results of the marketing research of the NCO «Atameken» (Atameken.kz, n.d.) showed that there are a number of problems in the waste sector of the Republic of Kazakhstan (Figure 1).

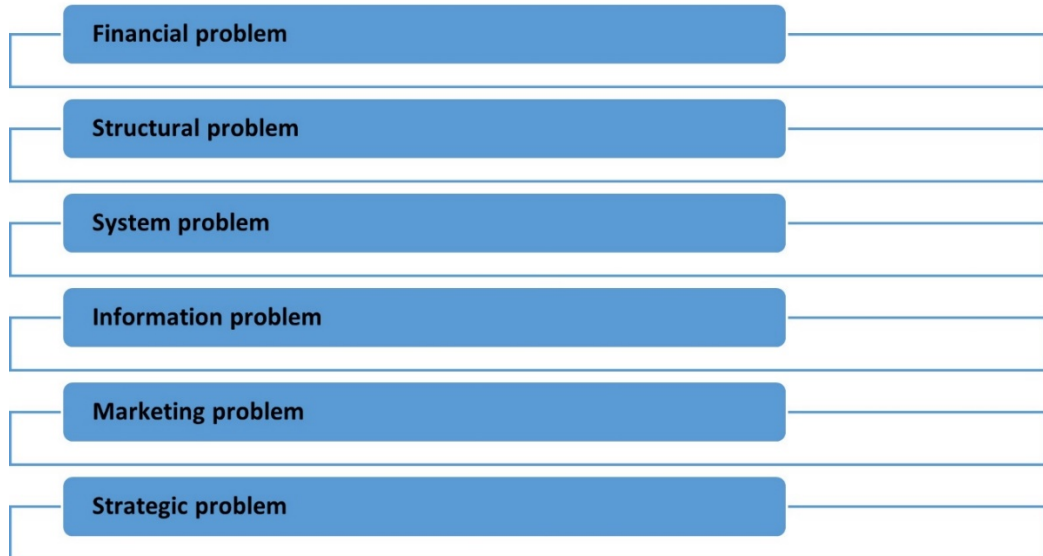| Financial problem |
| Structural problem |
| System problem |
| Information problem |
| Marketing problem |
| Strategic problem |

Figure 1. The main problems of the waste sector of the Republic of Kazakhstan

Source: Atameken.kz. (n.d.).

1. The financial problem lies in the fact that the main source of compensation for the costs of removal and disposal of solid waste is the payments of the population, low tariffs for waste disposal do not even cover the costs of removal and disposal of waste. Even though subsidies from their state budget are allocated, housing and communal services enterprises do not have the funds to create a proper system of separate collection. Along with this, there is no differentiation of the tariff for the disposal of separately collected garbage.

2. Structural problem. Most of the companies that carry out the disposal and processing of solid waste in the Republic of Kazakhstan are unprofitable; they spend their income mainly on urgent purposes and do not invest in innovative technologies to create modern waste management systems.

3. System problem. Currently, there is no comprehensive MSW management system in the country: several different, unrelated ministries deal with issues in this

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area. During the study, we came across the fact that the statistics they provide on the formation, collection, and processing of waste vary significantly. In general, this prevents the proper solution to the problem of waste recycling. For example, in the EU countries, waste management activities are carried out by a single body – the Environmental Protection Agency.

4. Corporate problem. In the EU countries, MSW management is carried out by private companies together with municipal authorities, in Kazakhstan, the activities of private companies in the field of waste are limited to monopolistic companies. The experience of European countries shows that thanks to the mobility of private enterprises that can attract foreign investment to build a waste recycling plant, an effective waste management system has been created.

5. Information problem. A non-systematic approach to carrying out information and explanatory work on separate waste collection, and installation of containers. At the same time, there is an insufficient level of environmental awareness and culture of the main part of the country's population, which greatly affect the effectiveness of the separate collection of household garbage and hinder the development of entrepreneurship in the field of waste.

6. The marketing problem is associated with a fairly limited market for secondary raw materials: most waste processors have problems selling raw materials obtained from household waste. In certain countries such as: Germany, Austria, Belgium, Netherlands, and Sweden, in order to expand the recyclable market, a number of measures are applied: preferential lending to waste recycling enterprises; mandatory use of secondary raw materials in the production of new goods (in %); a certain advantage in the public procurement system for manufacturers and suppliers of products from recyclable materials or with its use.

7. The strategic problem lies in the absence of real plans for the long-term use of solid waste, indicating prescribed goals, measures to achieve them, deadlines, resources, and those responsible at the district level. This leads to non-systemic, episodic actions that do not make it possible to obtain tangible results to reduce waste generation and increase recycling.

We have analyzed the sphere of waste management into three main types: solid waste, municipal and industrial waste (Table 2).

Table 2. Waste generation and recycling in the Republic of Kazakhstan for the period 2015-2020

	Unit of measurement	2015	2016	2017	2018	2019	2020
Solid household waste							
SHW generation	thousand tons	5467,3	5400,9	4864,3	4319,2	4736,6	4551,7
Share of recycling and reuse	%	1,8	2,6	9,0	11,5	14,9	18,6
Municipal waste							
Municipal waste generation	thousand tons	3235,5	2813,6	3415,0	3692,0	3674,0	3708,5
Share of recycling and reuse	%	11,5	12,3	13,0	11,6	10,Э9	20,5
Industrial waste							
Industrial waste	thousand tons	982236,4	792860	737342,6	830271	868646	759905

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generation							
Share of recycling and reuse	%	23,1	26,8	30,9	32,2	34,0	36,0
Hazardous waste							
Hazardous waste generation	thousand tons	251565,7	151391,1	126874,6	149962,4	180506,7	137828
Share of recycling and reuse	%	29,6	22,2	-	20,0	20,3	22,0

Source: Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan (2020).

Table 2 shows that an average of about 5 million tons of solid waste and 828 million tons of industrial waste, including hazardous waste, are generated annually in Kazakhstan. In 2020, on average, 242.7 kg of SHW and 40,516 kg of industrial waste accounted for one citizen of Kazakhstan. At the same time, there is a rather low level of processing of production and consumption waste. Despite a slight increase in the share of recycling compared to 2015, in 2020 these indicators remain at a fairly low level: for solid waste - only 18.6%, for municipal waste – 20.5%, for hazardous – 22%, for industrial – 36%.

For comparison, 66% of waste was recycled in Germany, 57.6% in Austria, 53.5% in Belgium, 53.1% in the Netherlands, 48.9% in Sweden, 45% in Japan, 41.7% in France (Tishchenko, 2018).

Foreign experience shows that waste recycling is a source of profit and the emergence of additional jobs. According to Frost&Sullivan, in 2018, the volume of the global market for processing solid waste, industrial and construction waste reached 282.1 billion US dollars (Chernysheva, 2019). For example, in Germany, the annual income of the waste recycling industry amounted to about 40 million euros, more than 200 thousand people worked in this industry (Shalginsky, 2022). There are over 56 thousand waste processing enterprises operating in the USA, with an annual income of about 240 billion US dollars (TASS, 2022, March 24).

From the above data, it can be seen that waste recycling is a fairly profitable type of environmental entrepreneurship, the so-called "green" business. In this regard, it is necessary to create conditions for the development of small and medium-sized businesses in the waste sector of Kazakhstan. The development of "green" business will allow, on the one hand, to solve the main problems of this industry and improve the environmental situation in the country; on the other, to rationally use the available natural resources and improve environmental protection measures of the Republic of Kazakhstan.

It should be noted that the Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan plans to burn garbage to reduce the volume of waste, followed by electricity generation and transmission to the city power grid according to the Waste to Energy mechanism. 185 billion tenge of investments will be allocated from the state budget for the construction of six incinerators with a total capacity of 100.8 MW, which will be put into operation in 2025 (Abylgazina, 2021).

Analysis of publications and expert opinions has shown that incineration is not the only and far from safe method of waste disposal (Gordyshevsky, 2020; Kusanova, 2021). The best practices of the EU countries, the USA and Japan indicate that the most optimal is a combined method of waste management: recycling of recyclable waste and incineration of the remaining. Burial at landfills, especially those that do not meet the requirements, as is customary in our country, is characteristic of lagging countries.
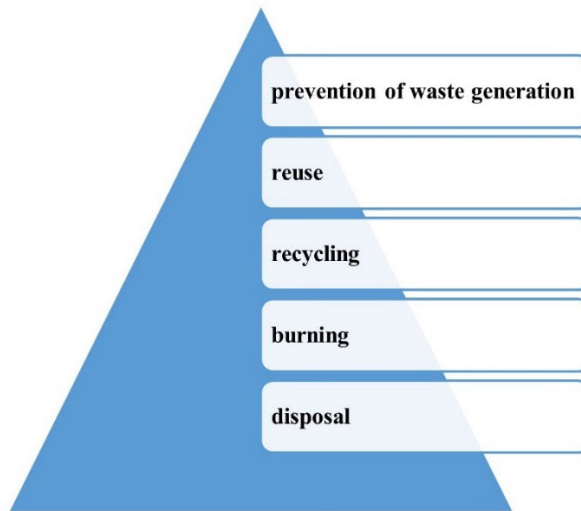
Figure 2. European model of the hierarchy of waste management methods

Source: Compiled by the author based on Directive of the European Parliament and of the Council on waste (2008/98/EC).

For example, in the EU countries, a Waste Hierarchy is used Framework Directive, which includes different methods of step-by-step waste management (Figure 2).

Figure 2 shows that the most preferred way of waste management is to prevent their formation. This is followed by pre-processing, which facilitates their reuse. Then the waste is sent for processing to obtain secondary material resources if there is no such possibility – for processing to obtain energy. And, finally, the last option for waste disposal is the direction for placement (burial) at landfills.

In Europe, incineration and burial are considered the least preferred methods of waste disposal, as they negatively affect the state of the environment. In addition, during incineration, a certain threat is created for residents of settlements that are located near the incineration complexes.

It is recommended for Kazakhstan is to adopt the experience of those countries of the world where waste is divided into fractions and processed into secondary raw materials with further production of finished products. Table 3 shows how the problem of the growth of agricultural, industrial; livestock, and solid waste can be solved by converting them into various types of energy, including biofuels.

Table 3. Foreign experience in waste processing into energy

№	Type of waste	Processing methods	Output Products	Usage, countries
1	Agricultural waste	- physical (drying, pressing, granulating) - chemical (roasting, gasification, carbonization)	Biofuel pellets, biochar, Biogas	Heat supply (Taiwan, Denmark)
2	Industry waste	-chemical (gasification, combustion, pyrolysis) - biological method (biomass processing)	Thermal energy, electricity Biogas (methanol)	For National Energy Center (Taiwan)
3	Animal waste	-chemical (gasification, combustion) -biological (fermentation, fermentation,)	Thermal energy, electricity Biogas (H2, methanol)	Biogas production (Germany, Sweden)
4	Municipal solid waste (MSW)	- chemical (burning) -biological (fermentation, fermentation, composting)	Thermal energy Biogas (H2, methanol)	For district energy centers (USA, Taiwan)

Source: (Osipov, et al. 2018).

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Based on the conducted research, we concluded that the effective waste management in Kazakhstan, it is necessary to take several measures of state support for business in this area:

- adopt the Law of the Republic of Kazakhstan "On Waste", which will regulate activities in the field of waste management;

- introduce safe waste disposal with the help of stricter requirements for landfills;

- more actively involve the population in the separate collection of household waste;

- strictly control the separate collection of hazardous waste to prevent their disposal and disposal in landfills;

- instead of incineration and disposal of waste, encourage entrepreneurial activities for waste recycling using circular business models;

- motivate manufacturers to reuse waste as recyclable materials until the full extraction of useful components;

- create opportunities for entrepreneurs to;

- to carry out waste disposal at the expense of the manufacturer (Huseynova, 2022).

Conclusion

A comprehensive analysis of the literature has shown that most countries of the world, including Kazakhstan, have chosen a course for a Green Economy to solve ecological and economic problems and sustainable development. Based on the analysis of various definitions of the Green Economy, the approach is justified from the standpoint of multiple uses of resources, when waste from one production becomes raw materials for another.

The study revealed that the existing waste management system in Kazakhstan is inefficient. The country is experiencing an annual increase in the volume of formation and accumulation of solid household waste (in 2020 - over 4.5 million tons) and industrial waste (over 759 million tons). Most of the waste without prior sorting and separate collection is exported to landfills, the total area of which

occupies 16 thousand hectares of land. Experts note that most of the existing landfills (97%) do not meet the requirements of sanitary and environmental standards. Along with this, 8884 spontaneous garbage dumps have been identified with the help of space monitoring.

It should be noted that despite the presence of waste collection points, separate collection, and sorting of waste into different types and fractions has not been established in most of the country. This fact complicates the development of entrepreneurial activities for the processing of waste and secondary raw materials, the level of processing of industrial waste is 36%, and solid waste is 18.6%, whereas in developed countries of the world it is over 60%.

The problems inherent in the waste sphere (financial, structural, systemic, corporate, informational, marketing, strategic) are identified and characterized. A set of measures to stimulate entrepreneurial activity in the waste sector of the Republic of Kazakhstan is proposed.

Limitations and Suggestions for Future Research

However, this study has some limitations: there is no proper state support and economic incentives for the full development of a business for recycling waste into secondary raw materials, producing finished products from waste, or using waste. Not all entrepreneurs know the principles and innovative business models of the circular economy. In this regard, further research is needed to develop a mechanism for state support and stimulation of the waste recycling business, and an analysis of the possibilities of using principles and business models in the waste sector of the Republic of Kazakhstan.

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