

ҚАЗАҚСТАН РЕСПУБЛИКАСЫ ҒЫЛЫМ ЖӘНЕ ЖОҒАРЫ БІЛІМ МИНИСТРЛІГІ
Л.Н. ГУМИЛЕВ АТЫНДАҒЫ ЕУРАЗИЯ ҰЛТТЫҚ УНИВЕРСИТЕТІ

МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РЕСПУБЛИКИ КАЗАХСТАН
ЕВРАЗИЙСКИЙ НАЦИОНАЛЬНЫЙ УНИВЕРСИТЕТ ИМЕНИ Л.Н. ГУМИЛЕВА

MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE REPUBLIC OF KAZAKHSTAN
L.N. GUMILYOV EURASIAN NATIONAL UNIVERSITY



"ЖАСЫЛ ЭКОНОМИКАҒА" КӨШУ ЖАҒДАЙЫНДА
ҚАЗАҚСТАН РЕСПУБЛИКАСЫНЫҢ ТҰРАҚТЫ ДАМУЫ:
ЕУРОПАЛЫҚ ОДАҚ ЕЛДЕРІНІҢ ТӘЖІРИБЕСІН ҚОЛДАНУ"
ХАЛЫҚАРАЛЫҚ ҒЫЛЫМИ-ТӘЖІРИБЕЛІК КОНФЕРЕНЦИЯСЫНЫҢ
ЕҢБЕКТЕР ЖИНАҒЫ

СБОРНИК ТРУДОВ
МЕЖДУНАРОДНОЙ НАУЧНО-ПРАКТИЧЕСКОЙ КОНФЕРЕНЦИИ
«УСТОЙЧИВОЕ РАЗВИТИЕ РЕСПУБЛИКИ КАЗАХСТАН
В УСЛОВИЯХ ПЕРЕХОДА К «ЗЕЛеной ЭКОНОМИКЕ»:
ПРИМЕНЕНИЕ ОПЫТА СТРАН ЕВРОПЕЙСКОГО СОЮЗА»

WORKS
OF THE INTERNATIONAL SCIENTIFIC AND PRACTICAL CONFERENCE
"SUSTAINABLE DEVELOPMENT OF THE REPUBLIC
OF KAZAKHSTAN IN THE CONDITIONS
OF TRANSITION TO A "GREEN ECONOMY": APPLICATION OF THE EXPERIENCE
OF THE COUNTRIES OF THE EUROPEAN UNION"

АСТАНА, 2022
ASTANA, 2022



Л.Н. ГУМИЛЕВ АТЫНДАҒЫ ЕУРАЗИЯ ҰЛТТЫҚ УНИВЕРСИТЕТІ
ЕВРАЗИЙСКИЙ НАЦИОНАЛЬНЫЙ УНИВЕРСИТЕТ ИМ. Л.Н. ГУМИЛЕВА
L.N. GUMILYOV EURASIAN NATIONAL UNIVERSITY

**"ЖАСЫЛ ЭКОНОМИКАҒА" КӨШУ ЖАҒДАЙЫНДА
ҚАЗАҚСТАН РЕСПУБЛИКАСЫНЫҢ ТҰРАҚТЫ ДАМУЫ:
ЕУРОПАЛЫҚ ОДАҚ ЕЛДЕРІНІҢ ТӘЖІРИБЕСІН ҚОЛДАНУ"**

*Халықаралық ғылыми-тәжірибелік конференциясының
ЕҢБЕКТЕР ЖИНАҒЫ*

СБОРНИК ТРУДОВ

Международной научно-практической конференции
**«УСТОЙЧИВОЕ РАЗВИТИЕ РЕСПУБЛИКИ КАЗАХСТАН
В УСЛОВИЯХ ПЕРЕХОДА К «ЗЕЛЕННОЙ ЭКОНОМИКЕ»:
ПРИМЕНЕНИЕ ОПЫТА СТРАН ЕВРОПЕЙСКОГО СОЮЗА»**

WORKS

of the International scientific and practical conference
**"SUSTAINABLE DEVELOPMENT OF THE REPUBLIC
OF KAZAKHSTAN IN THE CONDITIONS
OF TRANSITION TO A "GREEN ECONOMY": APPLICATION OF THE EXPERIENCE
OF THE COUNTRIES OF THE EUROPEAN UNION"**

АСТАНА
28.10.2022

ӘОЖ 338 (574)
КБЖ 65.9 (5Каз)
Ж 33

Рецензенты:

Мажитов Д.М. – к.э.н., профессор НАО «Евразийский национальный университет имени Л.Н. Гумилева»

Редакционная коллегия

Макыш С.Б. – д.э.н., профессор, декан экономического факультета, ЕНУ им. Л.Н. Гумилева, г. Астана

Stanislaw Luniewski – Генеральный директор ООО "ASTWA", профессор Университета финансов и менеджмента в Белостоке, почетный профессор ЕНУ им. Л.Н. Гумилева, Польша

Artur Luniewski – Член правления ООО "ASTWA" доктор философии, почетный профессор ЕНУ им. Л.Н. Гумилева, Польша

Майдырова А.Б. – д.э.н., профессор, заведующая кафедрой «Экономика и предпринимательство» ЕНУ им. Л.Н. Гумилева, г. Астана

Насырова Г.А. – д.э.н., профессор, заведующая кафедрой «Финансы» ЕНУ им. Л.Н. Гумилева, г. Астана

Сембиева Л.М. – д.э.н., профессор, заведующая кафедрой «Государственный аудит» ЕНУ им. Л.Н. Гумилева, г. Астана

Бейсенова Р.Р. – д.биол.н., профессор, заведующая кафедрой " Управление и инжиниринг в области охраны окружающей среды " ЕНУ им. Л.Н. Гумилева, г. Астана

Мукашева А.А. – д.ю.н., профессор кафедры "Гражданское, трудовое и экологическое право" ЕНУ им. Л.Н. Гумилева, г. Астана

Муталиева Л.М. – к.э.н., ассоциированный профессор, заведующая кафедрой «Туризм» ЕНУ им. Л.Н. Гумилева, г. Астана

Жагыпарова А.О. – к.э.н., ассоциированный профессор, зам.декана по научной работе экономического факультета ЕНУ им. Л.Н. Гумилева, г. Астана

ISBN 978-601-337-777-3

Ж 33

«Жасыл экономикаға» көшу жағдайында Қазақстан Республикасының тұрақты дамуы: еуропалық одақ елдерінің тәжірибесін қолдану» халықаралық ғылыми-тәжірибелік конференциясының еңбектер жинағы. – Астана: "Л.Н. Гумилев атындағы Еуразия ұлттық университеті"КЕАҚ, 2022. – 484

Сборник трудов международной научно-практической конференции «Устойчивое развитие Республики Казахстан в условиях перехода к «зеленой экономике»: применение опыта стран европейского союза». – Астана: НАО «Евразийский национальный университет имени Л.Н. Гумилева», 2022. – 484

Works of the International scientific and practical conference «Sustainable development of the Republic of Kazakhstan in the conditions of transition to a "green economy": application of the experience of the countries of the European Union». – Astana: NAO "L.N. Gumilyov Eurasian National University", 2022. – 484

ISBN 978-601-337-777-3

УДК 338 (574)
ББК 65.9 (5Каз)

© "Л.Н. Гумилев атындағы Еуразия ұлттық университеті"КЕАҚ, 2022 © НАО «Евразийский национальный университет имени Л.Н. Гумилева», 2022
© NAO "L.N. Gumilyov Eurasian National University", 2022

11. Goldstein L.B.: Effects of bilateral and unilateral locus coeruleus lesions on beam-walking recovery after subsequent unilateral sensorimotor cortex suction-ablation in the rat. *Restor Neurol Neurosci.* 1997; 11: 55-63.
12. Chang R., Kei-Lwun Y., Sumbria R.K.: Tumor necrosis factor α Inhibition for Alzheimer's Disease. *J. Cent. Nerv. Syst. Dis.* 2017; 9: 1-5.
13. Chin-Horng S., Chih-Yang L., Chun-Hao T., Hsiang-Ping L., Lun-Chien L., Wei-Chien H., Yang-Chang W., Ching-Liang H., Chih-Hsin T.: Betulin suppresses TNF- α and IL-1 β production in osteoarthritis synovial fibroblasts by inhibiting the MEK/ERK/NF- κ B pathway. *J. Func. Foods.* 2021; 86: 104729.

INNOVATIONS IN SOLID WASTE MANAGEMENT: BEST PRACTICES AND KEY TRENDS

Urazov A.K.

Doctoral student

Scientific advisor: Tolysbaev B.S., PhD in Economics, Professor.

L.N. Gumilyov Eurasian National University.

Astana, The Republic of Kazakhstan

e-mail: arslanurazov@gmail.com

In the modern world, achieving a balance between environmental protection, natural resource development and socio-economic sustainability is an acute issue on the global community's agenda. The market economy and unconscious consumption continue to lead to global, and most importantly, catastrophic consequences.

The impact of the anthropogenic factor, as an increase in consumption waste, is becoming more and more pronounced and leads to environmental crises, entailing socio-economic damage and risks to national security. At present, in addition to quantity, the diversity of production and consumption waste is rapidly increasing. Including an increasing number of components, the composition of the waste becomes more complex. In this regard, in recent years, there has been a particular need for a competent approach to the storage, treatment, recycling and disposal of waste.

According to the World Bank, about 2.1 billion tonnes of municipal solid waste (MSW) is generated annually in the world, 30-40% of which is not recycled in environmentally sound manner. At the current rate of urbanization, population growth and economic development in most countries, by 2050 the predicted volume of waste generated in the world will reach the level of 3.4 billion tonnes per year.

The daily generation of waste in the world is on average 0.74 kg per person. However, it is worth considering that with a detailed study, this figure ranges from 0.11 to 4.54 kg per day. The income level of the population plays an important role in this correlation. Thus, 16% of the world's population, high-income countries, produces about 683 million tonnes of waste, representing a third or 32% of the world's waste [1].

Kazakhstan, like most market economies, also faces the problem of increasing volumes and diversity of waste. According to the Ministry of Ecology, Geology and Natural Resources, 4.5-5 million tonnes of MSW are generated annually in Kazakhstan. Of these, only 21.1% were recycled in 2021 (2020 – 18.3%, 2019 – 14.9%, 2018 – 11.51%, 2017 – 9.05%) [2]. The accumulated 125 million MSW in more than 3 thousand landfills require an immediate and comprehensive solution in order to preserve the ecological balance for future generations.

The adopted concept of the country's transition to a "green economy" provides for a number of measures aimed at effectively solving environmental problems, including addressing waste management issues. However, a number of unresolved problems remain, requiring the introduction of best practices and innovative approaches that can solve existing problems and prevent their occurrence. Studying and adapting the approaches tested in developed countries to the local conditions does not guarantee the full success of the objectives. Thus, effective solutions to MSW

management problems require the full involvement of stakeholders, such as government, business and the public.

Most developed countries are actively developing their waste management infrastructure, circular economy principles and innovative approaches. Qualitative changes are associated not only with scientific and technological progress, but also with the intensification of competition among the economies of most countries. Numerous studies, including those of the World Bank, have shown that the most competitive in modern realities are countries that take into account the environmental factor by introducing strict environmental standards, innovations and effective regulatory methods.

The development of innovations in waste management is of extreme social importance. The development and implementation of the latest innovative methods and technologies in the field of waste management is cost-effective. The use of secondary resources in the production cycle as a raw material base can significantly reduce the economic costs of production while preserving natural resources. Thus, by developing and improving the processes associated with the extraction and processing of necessary resources, it is necessary to return them in a transformed form to production for reuse.

In the context of innovation in waste management, several stakeholders can be identified, such as waste generators, enterprises integrated in the waste management process, government and the public, NGOs and international organisations. Each of them has effective levers that, with the right and well-established system of interaction, are able to cope with the challenges of the global agenda.

Today there are various trends in waste management. In a number of developed countries, the concept of Zero Waste is actively used in practice. As defined by the Zero Waste International Alliance: Zero Waste is about conserving all resources through fair production, consumption, reuse and recovery of all items, packaging and materials. Nothing that poses a danger to the environment or human health should not be burned, buried, dumped into water or released into the atmosphere [3].

The American eco-activist Bea Johnson, developing this movement on her own example, in her book "Zero waste home: the ultimate guide to simplifying your life by reducing your waste" has defined the 5R principles (Figure – 1), meaning:

1. Refuse what is not needed. Discarding waste is the most effective way to minimize waste;
2. Reduce the amount of what is bought and consumed. Reduce the use of harmful, wasteful and non-recyclable products;
3. Reuse things that can be given a second life. To reduce waste, reuse items in the workplace instead of buying new ones. For each item that cannot be discarded, reduced or reused, try using it again;
4. Recycle things that could not be discarded, the consumption of which could not be reduced, or that could not be reused. It is necessary to hand over for recycling the small amount of waste that can not be used in any way;
5. Rot or dispose of the remainder on compost [4].

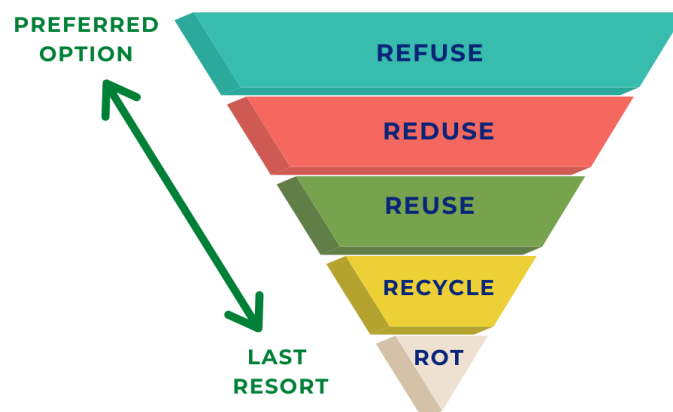


Figure – 1 5R Principles by Bea Johnson
Note: compiled by the author based on source [4]

Thus, the Zero Waste concept focuses on achieving high performance, in ways based on the introduction of producer responsibility for waste, eco-design, elimination of toxic materials, reduction the amount of waste, reuse, recycling and proper disposal.

Introducing innovations such as the installation of a personalised and automated system with separate collection and weighing of each fraction of MSW in residential areas has broad socio-economic and environmental benefits.

The installation of such systems benefits several parties:

- the public – motivated to receive remuneration which covers the MSW collection and disposal fees in a differentiated way, for responsible waste sorting;
- enterprises in waste management – achieve optimisation of the whole process, building the best routes through occupancy level sensors, obtaining quality and correctly segregated waste, quality raw materials;
- the state – solving socially important tasks, at the same time solving employment issues and developing a competitive environment;
- scientific institutes and other interested organisations - receive a kind of platform to consider the issue of further improvement of the waste management system and process.

Another example is reverse vending machine, which operate on the principle of a depository system. The depository system, which embodies the circular economy and works contrary to the principles of the linear economy "from raw material to product, from product to waste", involves the recycling of resources and materials.

In countries using reverse vending machine, additional value is included in the cost of packaging or tare and returned as QR codes on receipts by returning packages and tare (plastic, aluminium and glass) to automated collection points, which are often installed in shops.

Analysing the experience of developed countries in waste management, a model based on the principles of recycling and reuse can be highlighted. At the same time, non-recyclable waste is often used as energy resources using the "waste to energy" method. Wastes that cannot be recycled and are not suitable for use as energy resources are placed in modern landfills that meet the established requirements. It is important to note the importance of a properly designed landfill to avoid the release of pollutants into the environment.

The regulation of the waste management sector in the European Union is carried out in accordance with the Directive of the European Union 2008/98/C of November 19, 2008. This framework legislation on waste establishes general requirements and basic definitions in the field of waste management.

Sweden is a successful example with a well-organised waste management system. Sweden has strict legislation defining liability from producers to homeowners, utilities and recycling and waste disposal plants. Recycling is part of Swedish culture. The country recycles almost 99% of its waste, importing waste from other countries [5]. Residents regularly sort their waste into different fractions, allowing for proper recycling and disposal. With efficient technology, the Swedes have succeeded in converting household waste into electricity and heat. The smoke from the incinerators is filtered by powerful filters, preventing air pollution. The remaining ash and other by-products of the incineration process are recycled, and the extracted gravel is used in road construction. Only about 1% of the waste is stored in landfills of the country.

In Germany, responsibility for waste management is shared between the parties directly involved in the entire waste management system. For example, in 2013, a "Federal Waste Prevention Programme" was developed which has been successfully implemented to this day. The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety deals the key issues of waste management under the "waste prevention concept", which includes sections such as:

- Appreciate products and prefer to repair rather than throw them away;
- Reuse instead of throwing away;
- Eco-design – reducing environmental impact;
- Use market incentives to prevent waste;
- Disposable bags and packaging [6].

In the US, Americans are actively sorting waste, they started to think about waste management at the end of the 19th century. In 1895, the world's first waste sorting and recycling centre was opened in New York. Today, the process is streamlined and simplified as much as possible. By introducing differentiated fees for solid waste collection, it is more profitable to reduce the amount of daily waste and accumulate what can be sorted before the official waste collection day, as the separated waste is taken away free of charge. The shops also have reverse vending machines that accept bottles and cans through a depository system. It assumes that when buying goods in a container that can be recycled, a certain amount (about 10 cents) is already included in the price of the goods as a deposit. By surrendering this can or bottle, it is possible to get the money back [7]. Waste management is controlled by the Environmental Protection Agency under the Resource Conservation and Recovery Act (1976). According to this law, the environmental department of each state develops comprehensive industrial and municipal waste management plans, i.e. there is no national law mandating waste management in the United States, and state and local authorities can set their own waste management requirements [8].

In Japan there is such a word: "Mottainai". It encompasses the practice of carefully storing and using all things as long as possible. As the economy continues to grow, this "mottainai" spirit curbs waste generation and encourages the development of technologies for reuse, recycling and efficient use [9]. Municipal waste management activities are regulated by a number of legislative acts, which were initiated in 1970 by the Waste Management Act. This act stipulated that the local authorities should deal with municipal solid waste and the companies where this waste was generated should deal with industrial waste. The next important step was taken in 1991 when the Waste Recycling Act was passed and in 1995 the Cans and Packaging Recycling Act was introduced. Consumers were obliged to sort the cans and packaging they discarded into separate containers based on size and material, local authorities were required to store the sorted waste, and producers were required to recycle it for reuse. In different prefectures, local authorities regulate their own waste management. Each administration sorts waste from 4 or more fractions [10].

It is important to note that waste management and innovative approaches are complex issues requiring not only participation, but also active action on the part of all stakeholders. The State has the tools for effective waste management, thanks to the creation of conditions that meet modern realities and international experience. After all, the successful implementation of innovations in waste management requires not only technological, but also social and educational modernization, as well as the social responsibility of businesses. Thus, innovative approaches, which entail certain changes in the habits of the population, should be oriented towards a human-centered design. It will be more effective if the change is managed directly at the level of each individual.

References

1. Kaza, Silpa; Yao, Lisa C.; Bhada-Tata, Perinaz; Van Woerden, Frank. 2018. What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050. Urban Development;. Washington, DC: World Bank. © World Bank. <https://openknowledge.worldbank.org/handle/10986/30317> License: CC BY 3.0 IGO
2. Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan [Website]. – URL: [https:// www.gov.kz/memleket/entities/ecogeo](https://www.gov.kz/memleket/entities/ecogeo) (date of access: 13.10.2022)
3. Zero Waste International Alliance [Website]. - URL: <https://zwia.org/> (date of access: 12.10.2022)
4. Bea Johnson. Zero Waste Home: The Ultimate Guide to Simplifying Your Life. - London: Penguin Books, Limited, 2016. – 304 p.
5. Swedish Waste Management 2018 – Avfall Sverige [Electronic resource]. – URL: <https://www.avfallsverige.se> › SAH_2019_EN
6. «Abfallvermeidungsprogrammes Bundes unter Beteiligung der Länder», Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (BMU), 2013. https://www.bmu.de/fileadmin/Daten_BMU/Pool/Broschueren/abfallvermeidungsprogramm_bf.pdf
7. Malyutina A. How the separate collection and recycling of waste in the USA works // recyclemag.ru: [Electronic resource]. – URL: <http://recyclemag.ru/article/kak-ustroenyrazdelnyj-sbor-i-pererabotka-musora-v-ssha> (date of access: 12.10.2022).

8. United States. Resource Conservation and Recovery Act. Pub.L. 94–580, 90 Stat. 2795, 42 U.S.C. § 6901 et seq., October 21, 1976.

9. Ministry of the Environment Government of Japan (2012), Solid Waste Management and Recycling Technology of Japan. Toward a Sustainable Society Toward a Sustainable Society, Ministry of the Environment, Tokyo.

10. Ministry of the Environment Government of Japan (2014), History and Current State of Waste Management in Japan, Ministry of the Environment, Tokyo.

СРАВНИТЕЛЬНЫЙ АНАЛИЗ ПО НОРМАТИВНОМУ РЕГУЛИРОВАНИЮ ВОПРОСОВ СЖИГАНИЯ ГАЗА В СТРАНАХ БЛИЖНЕГО И ДАЛЬНОГО ЗАРУБЕЖЬЯ

Каундыков Д.Е.

магистрант 2 курса по специальности «Охрана окружающей среды и рациональное
использование природных ресурсов»

Евразийский национальный университет им. Л.Н. Гумилева,

г. Астана, Республика Казахстан

E-mail: brahma@gmail.ru

Введение. Ежегодно на нефтегазодобывающих и перерабатывающих предприятиях по всему миру сжигаются миллиарды кубометров природного газа. Сжигание газа в факелах приводит к потере ценного энергетического ресурса, который можно использовать для поддержки экономики и развития во многих странах. Сжигание на факеле также способствует изменению климата, выбрасывая в атмосферу миллионы тонн CO₂, что оказывает вредное воздействие на окружающую среду из-за несгоревших выбросов метана и черного углерода.

В настоящее время в Казахстане все больше возрастает потребность в газообразном топливе, получаемом из нефтяного попутного газа, при этом, достаточно большой объем его все еще сжигается на факелах. Основной объем технологически неизбежного сжигания газа приходится на такие крупные месторождения как Кашаган, Тенгиз, Королевское, Карачаганак, Жанажол, Кенкияк, Северная Трува, Алибекмола и Кожасай. Разрешение на внеплановое сжигание газа на факеле в Казахстане требуется только в том случае, если его продолжительность превышает указанные значения. Пороговые значения продолжительности сопоставимы с абсолютным пределом продолжительности сжигания газа на факеле, рассматриваемым для V9 в Республике Казахстан. Сжигание газа на факеле в течение более продолжительного времени допускается при наличии разрешения или утверждения. Контролирующим органом является уполномоченный орган в области углеводородов (Министерство энергетики РК). Данным органом согласно Правил выдачи разрешений на сжигание сырого газа на факелах выдается разрешение при технически неизбежном сжигании сырого газа при условии наличия всех проектных документов. [1]

Исходные данные. Норвегия, разрабатывающая морские нефтяные месторождения, входит в десятку ведущих стран-экспортеров нефти и в тройку стран по экспорту природного газа, при этом все осуществляющиеся здесь нефтяные операции с финансовой точки зрения являются высокоперспективными. Добыча нефти и газа в Норвегии осуществляется на континентальном шельфе трех морей: Северного, Норвежского и Баренцева. Норвегия всегда уделяла особое внимание вопросу сжигания попутного газа и выбросам в атмосферу, что нашло отражение в принятии четкой позиции «несжигания» и структурированного законодательства. Закон о нефтяной деятельности устанавливает строгие ограничения по сжиганию попутного газа, благодаря чему на Норвежском континентальном шельфе поддерживается низкий уровень сжигания ПНГ по сравнению с международным уровнем. Кроме того, Норвегия была одной из первых стран в мире, которая еще в 1991 году ввела налог на выбросы CO₂, что стимулировало нефтяные предприятия к технологическим разработкам