

WASTE RECYCLING INDUSTRY MARKET RESEARCH



This market research has been made as a part of the LEF network Azerbaijan project.

The project LEF network Azerbaijan's vision is to increase innovations and the bio-economy of the region by exporting services, know-how and goods to Azerbaijan. As a result, the Central Baltic region will be more sustainable and competitive. The joint challenge is that Azerbaijan is specific due to market needs, language and business culture. For enterprises market entry individually is much harder than cooperating jointly with other enterprises and business support organisations. As a result export to the 3rd countries will be achieved faster and more effectively.

The project LEF network Azerbaijan aims to achieve 10 sales agreements during 36 months between Finland's, Estonia's and Latvia's mature SMEs and Azerbaijan. Based on small research matching demand and offers are the ICT sector, Green technologies, education - higher and lifelong, interior design as a service and interior design products.

Project period: 01.03.2023. - 28.02.2026.

Project partners:

- Latvian Chamber of Commerce and Industry (Latvia)
- Estonian Chamber of Commerce and Industry (Estonia)
- Satakunta University of Applied Science (Finland)
- Caspian Energy Club (Azerbaijan)

Project “LEF Network Azerbaijan” is co-financed by Interreg Central Baltic programme.

This market research does not present any official EU opinion.

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1. Regulation of waste management in Azerbaijan

Waste Management in the Republic of Azerbaijan is regulated by the **Law of the Republic of Azerbaijan "On industrial and household waste"** adopted on June 30, 1998. This law defines the state policy and legal relations of the Republic of Azerbaijan in the field of waste management in order to prevent the harmful effects of industrial and household waste (hereinafter - waste) on human health and the environment, except for harmful gases, sewage and radioactive waste, to reduce their dangerous impact, to ensure ecological balance in nature, as well as to involve such wastes as sources of recycled raw materials into the economic cycle.

Waste volume

In 2022, 3984.1 thousand tons of waste were generated in the country, or 5.4% more than in the previous year (2021), and 66.7% of them were solid waste, and 33.3% were various types of waste generated by the production activities of enterprises.

78.3% of the 2,658.3 thousand tons of solid household waste generated last year were transported to landfills for disposal, 21.2% were used for energy production, and 0.5% were sold within the country. Through the use of household waste, 205.3 million kWh of electricity was generated, or more than 6.3 % compared to 2021.

Recycling raw materials and waste generation (by thousands of tons of years)							
	2015	2017	2018	2019	2020	2021	2022
Waste generated in the preparation and processing of meat, fish and other foodstuff of animal origin	8.7	7.0	5.9	6.3	6.0	6.4	7.8
Waste generated in the preparation and processing of fruits, vegetables, cereals, vegetable oils, tea and tobacco	37.9	54.1	51.6	49.4	61.5	69.6	113,5
Waste generated in sugar processing	-	11.2	13.7	38.5	30.1	8.7	20.1
Waste generated in the processing of dairy products	0.1	1.0	1.1	1.2	0.5	0.6	0.4
Waste from the cotton cleaning industry	2.9	34.4	64.9	96.4	89.7	87.3	83.5
Paper and cardboard waste	2.2	5.7	8.9	38.4	38.9	43.8	46.8
Recycled textile materials	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Shards of glass	0.1	0.1	1.9	2.5	9.6	0.8	1.9
Plastics and polymers	0.4	2.5	3.2	2.6	2.4	2.3	1.9
Waste from extraction, mining, quarrying, physical and chemical processing of minerals	1.3	29.7	4.2	4.7	5.0	4.8	3.5
Ferrous metal waste	346,3	495,7	468,8	426,4	376,2	367,3	449
Non-ferrous metal waste	0.1	0.5	0.4	0.4	0.8	0.9	0.6

Bottom ash	103,5	98.0	46.7	119,6	69.0	146,6	95.4
Wood waste, thousand m ³	0.6	22.4	15.5	16.7	12.0	4.7	4.6
Household waste, million m ³	6.4	6.6	7.3	8.4	9.8	10.8	11.1

In industry and other sectors of the economy, 28.5% of industrial wastes were used as raw materials in enterprises last year, 42.7% were sold in the country, 3.8% were exported, 13.8% were transported to landfills for disposal, and 11.2% remained in enterprises.

As a result of the production activities of enterprises, in 2022, 337.1 thousand tons of hazardous waste were generated, and their share in the total amount of waste was 8.5%. 63.1% of the waste was generated at the enterprises of the mining industry, most of which falls on the share of enterprises located in Baku. 55.0 thousand tons of hazardous waste were completely neutralized last year, including the residues generated in previous years.

2. National strategy and organization of waste management in Azerbaijan

National strategy

One of the important works carried out in the field of waste management in recent years was the implementation of the "National Strategy for 2018-2022 on the improvement of solid household waste management in the Republic of Azerbaijan".

The objectives of the National Strategy are as follows:

1. expansion of solid waste collection services to all residential and non-residential premises in the Republic of Azerbaijan;
2. ensuring safe and efficient disposal of all waste, which is not profitable from the point of view of costs and cannot be used on the restoration of new reserves;
3. capacity building for resource recovery through sorting, processing and recycling of waste through public education, efficient public awareness campaigns, new solid waste systems and market development;
4. special management of potentially hazardous waste in order to reduce harm to public health and the environment;
5. gradual elimination of open landfills that do not meet environmental requirements in order to reduce adverse impacts.

The priority directions of the National Strategy are as follows:

1. improving the quality of management and ensuring efficiency in this area as a whole due to the use of best practice and advanced technologies in the management of solid waste;
2. strengthening the material and technical base of the field, construction of new infrastructure facilities, provision of supply with modern machinery and equipment;
3. ensuring activities in the management of solid waste based on international standards (waste reduction, sorting them for reuse and processing, recovery of resources);
4. gradual reduction of subsidies allocated from the state budget for solid waste management, introduction of a new tariff system and collection mechanisms;
5. taking appropriate measures to obtain energy from solid waste by applying modern methods.

Financing of the national strategy is provided for by the following sources:

1. funds intended for the management of solid household waste by relevant government agencies in the state budget expenditures;
2. microloans;
3. grants from international donors and financial institutions;
4. domestic and foreign investments;
5. other sources of funding not prohibited by law.

Organization of waste management

The strategy envisaged the implementation of the respective “Action plan” to achieve the set goals, which was entrusted to the Ministry of Economy of the Republic of Azerbaijan, the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan, the Ministry of Health of the Republic of Azerbaijan and local executive authorities (including municipalities).

A special place in the strategy is given to improving the waste management system of Baku, the largest city in the country. Within the framework of the implementation of the project, the “Clean City” project was expanded in Baku; Garadagh and Surakhani waste landfills were fully restored, numerous illegal waste sites were identified and cleaned, new machinery and equipment were purchased, and an initial data base for waste management was established.

Despite the work done so far in the field of waste management in Azerbaijan and the allocated funding, there are still barriers in this area. One of the main reasons for this lies in the fact that the waste collection service is carried out in a fragmented way, and not centralized within specific institution.

Urban Housing and Utility Services Departments of local executive bodies, including Baku City, take over the work of collecting and transporting waste. Municipalities, on the other hand, are actually subordinate to local executive authorities, and their participation in the provision of solid household waste services is weak.

"The Baku City executive power carries out the activities of collection and transportation of household waste in Baku. "Tamiz Shaher" JSC is engaged in transportation, sorting, recycling and disposal of accumulated waste. The company carries out this at its enterprise located in the Balakhani settlement of Baku (more details below).

In addition, on the basis of the contract between the Department of Housing and Utility Services of Baku and the British company "Mott MacDonald", which has extensive experience in this work, a new concept on household waste was developed and implemented in Baku from July 10, 2019 to manage the process of collection, transportation and sorting of solid household waste.

In the framework of the concept a more optimal option for sorting household waste was chosen. Waste is accepted from the population at the initial stage divided into 2 groups as food and non-food waste. At a later stage, non-food waste is already used in the processing plant for plastic, metal, paper, etc. It is recycled by sorting. For this purpose, new plastic containers with strong lids in 2 colors - green and orange - have been installed in several districts of Baku city at the initial stage and gradually in all districts for separate collection of solid household waste. Containers of green color are intended for mixed, including food waste. Orange-colored containers are intended for paper, cardboard, plastic, glass and metal waste. However, in the territory of the historical reserve "Icheri Sheher", which is the central and historical part of Baku, separate special containers are used for sorting non-food waste products. 57 new utility vehicles and mechanisms that fully meet modern requirements were purchased for Baku city utility services.



The implementation of the project is controlled by the Baku City Executive Power. In addition, the management and representatives of "Mott MacDonald" company supervise the inspection of the composition and sorting level of waste in a specially established Monitoring Center for solid waste management of Baku City Executive Power. In order to monitor the progress of the project, the composition and weight of the sorted waste collected in each district are regularly examined, the results are compared with the previous period. Authorized representatives of the company visit Baku for

monitoring and conduct research in this direction. According to the analysis carried out by "Mott MacDonald" company only in Narimanov District of Baku, the percentage of sorted wastes reached 32%, and their suitability for recycling reached 55-60% as a result of the work carried out in this direction for 3 years.

In Baku and major cities of the country, such as Ganja and Sumgayit, local executive bodies, public associations and companies have installed a boxes for special dressing for the collection of worn and unnecessary but suitable for use items of the population within the framework of social projects. These projects prevent unnecessary items of clothing from being disposed of as household waste. It is planned to sort the collected clothing products, give new ones to needy families, and send the others for recycling.



Organization of waste management in regions and rural areas

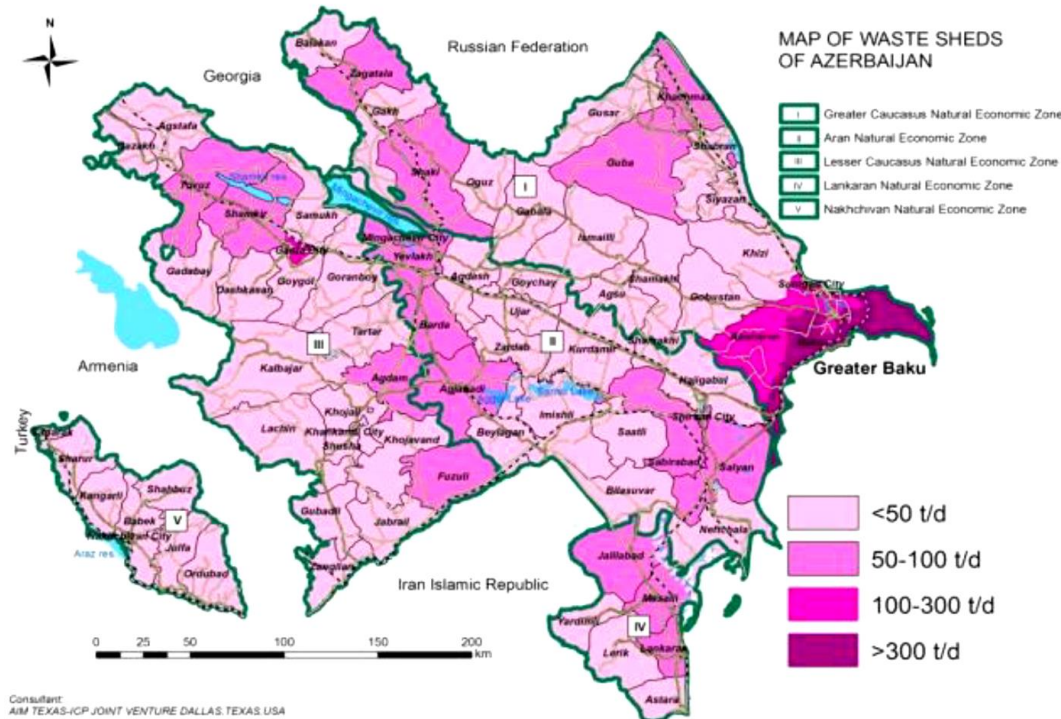
There are many problems in the field of transportation, sorting and disposal of solid waste in general, with the exception of large cities in the country. In particular, gaps in the field of waste disposal, recycling and disposal are more distinct. According to official figures, about half of the population in the country lives in rural areas, and waste collection services partially cover villages. Observations show that the collection, storage and transportation of waste in regions is inadequate and not properly planned. Almost in most cases, the collection of waste in open landfills, non-fencing of areas allocated for this purpose, mixing of pollutants from waste buried in these areas into groundwater, placing some waste landfills directly along the banks of rivers and on flood land plains creates the need to pay special attention to this area. Each district has a controlled landfill, mainly located in the center of the district. In addition, there are illegal dumps, but there is very little information about them. Landfills in the regions are not properly built and do not meet international standards. One of the main problems is the lack of waste sorting in households, and industrial enterprises have a low interest in the use of processed raw materials. One of the other problems in this area is the lack of knowledge of society in this area.

In comparison with cities such as Baku and Sumgayit, as well as with regional centers, the collection and transportation of household waste through special boxes in villages can be considered a rare event.

The main reason is that, unlike cities, in villages, the competent body that takes responsibility for this problem has not been specified. Even experts emphasize that this issue has not been resolved from a legal point of view. Housing and utility services organizations are directly authorized to collect and transport waste in cities. It is not known exactly that the organization of waste management in rural areas, in particular, sorting by the population, collection in a certain place and by means of containers, transportation of waste to landfills or transfer to processing facilities, is within the competence of local communal organizations or municipalities. The legislation does not impose restrictions on the involvement of each of these two institutions in this process. In most rural areas, housing and utility services institutions do not exist, and municipalities emphasize that the execution of this power is not within the framework of their material capabilities under current conditions. Because the execution of this power requires the presence of appropriate infrastructure (waste landfills), equipment (boxes for assorted waste), vehicles and an appropriate number of personnel.

Rural municipalities, whose annual budget does not exceed 5-10 thousand AZN, cannot cope with this task. And it is not possible to collect fees for the transportation and disposal of household waste from the entire rural population.

Map D.1. Waste Shed Map of Azerbaijan, 2017



In general, the fees for waste collection are regulated by relevant rules according to the legislation. According to the rules, the calculation and payment of the fee for waste is carried out in accordance with

the instructions drawn up and approved by the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan in agreement with the Ministry of Economy and Industry of the Republic of Azerbaijan.

3. Projects implemented in the direction of solid waste management in Baku City and surrounding areas.

The Integrated solid waste management project

The purpose of the “Integrated solid waste management” Project which is being carried out within the framework of “Absheron Ecological Rehabilitation Program” funded by The World Bank and the Republic of Azerbaijan is to support reforms conducted for systematic and continuous organization of solid municipal waste collection and utilization. The loan agreement between World Bank and Azerbaijan Republic was signed on May 20, 2009. The document has been signed by Shahin Mustafayev, the Minister of Economic Development of Azerbaijan Republic and Gregori Yedrjeychak, the manager of World Bank in Azerbaijan.

The activities outlined under the project are being conducted in 5 components. Thus, according to the project component on institutional reform, rising the potential and project management, the development of strategic planning, establishment of “Tamiz Shahaar” JSC and its performance and development is being supported. The control of environmental impact on MSW management, increasing the efficiency of existing landfill, the purchase of up-to-date equipments and technologies (weigh bridges, bulldozers) and the construction works (fencing, waste dumping, laying internal roads and etc.) are being financed within the framework of the project component on the rehabilitation and management of Balakhany landfill. Parallel to the rehabilitation and improvement activities of Balakhani landfill, preparatory activities for its total closure in future are also being conducted today. In addition to the above

mentioned activities the preparatory works for building new modern landfills are also being conducted today.

Under the project component on closing and management of other landfills, the closing and cleaning of other unofficial landfills in Baku city, the improvement of other landfill's management (or closure) will be financed.

Within the frame of the project component on equipment provision for waste collection, the measures will be taken for expansion of service quality in Baku districts and in other areas where solid municipal wastes are not collected effectively, in order to increase the efficiency of the service and scale of solid municipal waste collection in most demanded areas there will be financed purchasing of lorries and waste trucks.

The Final- under the component of technical preparation of post project investments there will be carried out the feasibility study and environmental impact evaluation necessary for designing of new landfills, and establishment of transfer stations for increasing the efficiency of waste collection system. As a result the mentioned measures will provide an opportunity to solve the problem of solid municipal waste, to

improve the ecological condition in Baku and Absheron, to eliminate the factors causing danger for the environment, for potable water and peoples' health due to harmful wastes.



The total amount of the project budget planned for 5 years is 41.5 million US dollars. The amount of the loan provided by The World Bank on this project is 29,5 million US dollars, and it is planned to be provided through the International Reconstruction and Development Agency. The rest of amount is the

contribution of Azerbaijan Government and the VAT obligation.

Balakhany sorting facility

Material recovery facility with annual capacity of 200 thousand tons constructed to develop segregating household waste and recycling business in the country began to operate in test mode from

August. It completely started to operate after the inauguration ceremony in which the President of the Republic of Azerbaijan Ilham Aliyev also participated on December 19, 2012. Designing Material recovery facility was carried out by “Aztech Project Construction” LLC. Contractor is “M-Naf” Company, and supplier Company is “Adelmann”. As a result of sorting paper, glass, plastic, non-ferrous metal, iron, and other recyclable materials are segregated and as a result, total volume of waste is reduced, cheap raw material market will be formed, background for establishment of recycling industry in the country is created, energy is saved, and negative impact on environment is reduced. Additionally, hazardous waste as batteries, accumulators, and electronic waste are segregated from general waste and are sent to proper places.

The main advantages of the project are:

- Reduction of negative impacts on the environment and human health;
- Saving natural resources and energy;
- Cheap and recyclable raw material market;
- Stimulation of the recycling industry;
- Reduction of the amount of final waste;
- New workplaces;



Waste-to-energy plant

The construction of Waste-to-energy plant was decided within the framework of “The Comprehensive Action Plan about the improvement of ecological situation in the Republic of Azerbaijan for 2006-2010

years” approved by the Decree of the President of the Republic of Azerbaijan dated 28.08.2006. The French company CNIM, the winner of the tender for the construction of the plant, started its work on the basis of design and "turn-key" principle. The President of the Republic of Azerbaijan Ilham Aliyev laid the foundation of Waste-to-energy plant on November 3, 2009 and participated in the Plant’s inauguration ceremony on December 19, 2012. The plant, built on an area of 20 hectares in the Balakhani settlement and with an annual capacity of 500 thousand tons of household waste, including 10 thousand tons of medical waste, is currently managed by the French company PAPREC Energy Azerbaijan. As a result of the waste incineration process, the plant is capable of producing up to 200 million kWh of electricity per year, and the energy obtained during the year can fully supply 100,000 homes with electricity. It is considered to be the biggest Waste-to-energy plant in Eastern Europe and CIS countries. The plant was constructed using 4G technologies and completely complies with local and European standards of environmental protection. Fly ash generated during the incineration process is caught by the special filters and does not pollute the environment. Concerning the bottom ash which is heavier and less harmful could be utilized as a construction material for road construction. And finally, industrial water used for cooling during waste incineration is discharged to sewerage only after treatment. Monitoring of emission level at the plant is conducted and controlled daily.



Balakhany Industrial Park

Within the framework of “State Program on social and economical development of Baku and its settlements in 2011-2013” confirmed with the Decree of the President of the Republic of Azerbaijan Ilham Aliyev one of the main ways of developing recycling in the country – Balakhani eco-industrial Park will be established. On December 28, 2011 “Decree of the President of the Republic of Azerbaijan on establishing Balakhani Industrial Park in Baku” and “Decree of the President of the Republic of Azerbaijan on providing operation of Balakhani Industrial Park” were signed by the President of the Republic of Azerbaijan. The

foundation of the Industrial park was laid by the President of the Republic of Azerbaijan on December 19, 2012.

The main purpose in establishing this park is to make favorable condition for potential entrepreneurs and investors interested in recycling industry. The government will provide all the required conditions for mechanical processing and producing equipments in the Park and will support enterprises. Industrial Park will be established close to Balakhani landfill and Waste-to-Energy Plant as well as to main highway and it will make favorable condition for taking raw material and energy or product to the market. It is planned to construct internal and external infrastructure of the Park in order to increase interest of potential entrepreneurs and investors for green business, especially recycling industry. So that the road will be constructed, electricity, gas water, drainage, and communication lines will be lined up as an external infrastructure. Registration office and scales will be placed in the entrance of the Park, office and operation building will be constructed in the area and all required infrastructure will be created.

The main advantages of Eco-Industrial Park with total area of 7 ha (production area – 23 460 m², infrastructure area – 3 000 m²):

- To create unique infrastructure in one area;
- To reduce environmental impact as a result of activity of green business;
- To establish enterprises of recycling/reusing and production;
- Sale of obtained raw material and extension of market of produced goods.

Businessmen interested in this field can apply to “Tamiz Shahar” JSC.

Solid waste recycling

Special measures are being taken to reduce the amount of plastic waste in the Republic of Azerbaijan. In order to reduce the pollution of nature with plastic and polyethylene products, special attention is paid to the transition to packings made of ecological materials, the sale of polyethylene bags in stores, and recycling of plastic and polyethylene waste.

The Ministry of Ecology and Natural Resources is constantly working with representatives of “Azersun Holding”, “Metak”, “Azekol” companies and “Tamiz Shahar” OJSC engaged in recycling of plastic waste. Many institutions have special boxes for recycling household waste, especially paper and plastic waste.



Recovery potential of solid waste in Azerbaijan during the collection of waste in Azerbaijan, their informal processing is also widespread. The processing of plastic, metal and paper waste for the production of second-hand raw materials from scrap is carried out mainly informally. There is not enough statistical information about production from secondary materials. Metal pieces collected by waste traders and waste collectors are processed mainly by the large iron and steel industries located in Baku and Sumgayit. Processing of paper waste is mainly carried out in Sumgayit and Balakhani for the production of napkins, sachets, cellophane, etc. In developed countries, the processing of metal, plastic and glass waste is carried out using the latest technologies that make it possible to get more out of waste, causing less harm to the environment. In this regard, there is a serious need for the introduction of new technologies related to waste processing in Azerbaijan.