

PROJECT PERFORMANCE ASSESSMENT REPORT

AZERBAIJAN

ARP II Integrated Solid Waste Management Project

Report No. 162952

SEPTEMBER 13, 2021



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**ARP II INTEGRATED SOLID WASTE MANAGEMENT PROJECT
(LOAN IBRD-75490, IBRD-82740)**

September 13, 2021

Financial, Private Sector, and Sustainable Development

Independent Evaluation Group

Abbreviations

EBRD	European Bank for Reconstruction and Development
IBRD	International Bank for Reconstruction and Development
JSC	joint stock company
LEA	local executive authorities
MSW	municipal solid waste
SWM	solid waste management

All dollar amounts are US dollars unless otherwise indicated.

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Data

This is a Project Performance Assessment Report by the Independent Evaluation Group of the World Bank Group on the Absheron Rehabilitation Program II Integrated Solid Waste Management Project (P110679). The assessment aims to identify what worked and what did not work under the project and why, to draw lessons for future operations. Appendix C discusses this instrument and the methodology for this evaluation. Following standard Independent Evaluation Group procedure, copies of the draft Project Performance Assessment Report were shared with relevant government officials for their review and comment, which are attached in appendix G.

Absheron Rehabilitation Program II Integrated Solid Waste Management Project (P110679)

Basic Data

Country	Azerbaijan	World Bank financing commitment	\$29,500,000 (original financing), \$47,100,000 (additional financing)
Global Practice	Urban, Resilience, and Land	Actual amount disbursed	\$76,600,000
Project name	ARP II Integrated Solid Waste Management	Borrower commitment	\$12,000,000
Project ID	P110679, P144279 (additional financing)	Actual total project cost	\$97,100,000
Financing instrument	Investment project financing		
Financing source	IBRD-75490, IBRD-83740	Environmental assessment category	B

Note: ARP = Absheron Rehabilitation Program; IBRD = International Bank for Reconstruction and Development.

Dates

Event	Original Date	Actual Date
Approval	June 17, 2008	June 17, 2008
Effectiveness	July 31, 2009	July 31, 2009
Restructuring	June 27, 2013	January 10, 2014
Mid-Term Review	June 29, 2012	June 29, 2012
Closing	September 30, 2013	August 31, 2018

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Summary

Project Background and Description

This is a Project Performance Assessment Report by the Independent Evaluation Group of the World Bank Group on the Absheron Rehabilitation Program II Integrated Solid Waste Management Project in Azerbaijan. The assessment seeks to identify what worked and what did not work under the project and why. The project was designed in 2008 to support the reform of the Greater Baku area solid waste management (SWM). Its project development objective was “to support (i) improving solid waste disposal management; (ii) increasing waste collection coverage; and (iii) enhancing waste data information and financial management capacity in the Greater Baku area.” The project closed in 2018, after 10 years of implementation, and \$76.6 million was disbursed under the two International Bank for Reconstruction and Development loans.

In 2006, the government of Azerbaijan set out priorities to address environmental pollution caused by oil and gas extraction and municipal pollution in the ecologically sensitive Absheron Peninsula, where the capital city of Baku and the second-largest city, Sumgait, are located. The government’s Environment State Program 2006–10 launched an ambitious agenda to change prevailing SWM practices throughout the country, with the initial emphasis on Greater Baku. This reform agenda included a comprehensive operational, financial, and legal restructuring of the sector in Baku, with significant investments in collection and disposal infrastructure.

The main challenges for SWM and collection in the Greater Baku area were lack of coverage, low service quality, lack of safe disposal options, and lack of financial sustainability. Poorly managed solid waste disposal was a highly visible environmental issue; air pollution and smoke from the old Balakhani dump could be seen in the capital city of Baku. Outside the central city, informal dump sites were numerous, especially in the new settlements, where service coverage and quality were inadequate. Both the formal and informal disposal areas posed health risks to residents. The sector was financially unsustainable because of inadequate coverage of the billing system, low enforcement, and low tariffs.

Results

Under the project, the World Bank helped improve access to regular waste collection services for an additional 800,000 residents of Greater Baku, increasing waste collection coverage to 79 percent of the metropolitan population of Baku in 2018, up from 60 percent in 2008. Municipal solid waste (MSW) generation in Greater Baku is

estimated at 2.06 million tonnes, or approximately half of the MSW generated countrywide.

Barriers remain for improving waste collection services in the Greater Baku area because the responsibility for the provision of waste collection services continues to be fragmented. The Departments of Housing and Communal Services of the local executive authorities in Azerbaijan, including Greater Baku, mainly take on the waste collection and transport services. The municipalities are de facto subordinated to the local executive authorities, and their participation is weak in solid waste service delivery.

The World Bank helped address poorly managed solid waste disposal in Greater Baku by transforming the main city dump into a well-managed sanitary landfill. The upgraded Balakhani landfill is the only sanitary landfill in the country (120 hectares of land). An additional 9.7 million tonnes of capacity was created under the project. With the Balakhani landfill upgrade, informal waste pickers were incorporated into the formal economy. In addition, 132 informal dump sites (equaling 199 hectares) were closed to minimize the negative environmental effects associated with nonsanitary waste disposal in Greater Baku; 40 dump sites were closed under the World Bank project (143 hectares), and 92 were closed by the government (56 hectares). However, uncontrolled disposal continues in Greater Baku—an estimated 50 percent of the generated waste is dumped illegally and does not reach the sanitary landfill and waste treatment facilities. This continuation of past practice is largely attributed to nonavailability of waste transfer facilities in Greater Baku, a lack of financial incentives for operators to deliver waste to the new treatment and disposal facilities, and a lack of effective control mechanisms in place and effective enforcement.

The World Bank project also contributed to institutional development by supporting the creation of a dedicated agency responsible for waste treatment and disposal services in Greater Baku. Tamiz Shahar (Clean City), a new state-owned joint stock company (JSC), was established in 2009 to manage all assets related to solid waste recovery and disposal in the Greater Baku area. Tamiz Shahar JSC has evolved into a professional public enterprise running the sanitary landfill (financed under the World Bank project), complex treatment facilities (a materials recovery facility and a waste-to-energy plant), and an eco-industrial park. The company maintains a robust waste information system, compiling disposal and treatment data from multiple entry points and sources to ensure performance monitoring. However, the company has operational limitations. Both treatment facilities that Tamiz Shahar JSC manages are operating below capacity because of a low share of waste received relative to the amounts generated. The treatment facilities have high capital and operating costs, and the company receives significant subsidies from the state budget to offset low tariffs and inadequate waste

received at the facilities. The original plan was to consolidate both the waste collection and disposal systems gradually into one new entity, but this has not happened yet.

The World Bank bridged the gap in sector diagnostics to support decision-making and policy action in MSW management in the country. The National SWM Strategy, developed with World Bank support, was approved by a presidential decree in 2018. It established a critical platform to serve for decision-making and as a key tool for policy action. The strategy offers an approach to address key sector challenges nationwide and sets out a detailed, phased road map to enhance the sector and its performance. It focuses on improving core collection services and disposal processes to reduce illegal dumping and envisions the need for regionalization of disposal services outside Greater Baku. The key to the sector's sustainable institutional and financial setup is the need to improve tariff collection rates and revenue collection and diminish the sector's reliance on the state budget, strengthen institutional performance, and improve relevant institutions' regulatory and control functions. Although there is some progress in the implementation of the National SWM Strategy, a broader institutional reform of the sector and other critical steps in improving SWM are yet to materialize.

The World Bank sustained a policy dialogue on the reforms needed to improve the SWM sector's financial performance. Its recommendations were set to broadly prioritize a reform of the financial flows to create the right set of incentives, strengthen the oversight functions of inspectorate bodies, and enhance the efficiency of operations. The government has not yet embarked on the critical structural reforms to move the sector toward financial sustainability and start the implementation of its strategic directions also set out in its strategy document. Azerbaijan's SWM sector remains highly subsidized by the state budget. In Greater Baku, the state budget finances 80 percent of the costs. The tariffs and tariff collection rates are low, and the collected charges and expenditure of budget transfers for services, including waste management, are inadequately administered.

What Worked, and Why?

High-level political commitment, along with well-targeted World Bank interventions, helped set the stage for the project implementation. The government was committed to addressing the environmental degradation in the capital city of Baku caused by its poor SWM. The vision subsequently was to develop Balakhani as Greater Baku's principal recycling, recovery, and waste management center. The project focused on the targeted interventions of reestablishing infrastructure and basic services, with realistic targets set in the context of a significant sector data gap. It used a selective approach within the broader government agenda.

Early in the implementation, there was a strong emphasis on building the project management team's capacity for relevant functions that facilitated an effective implementation of the project technically and regarding processes. Successful cost-effective technical solutions that the World Bank introduced to rehabilitate the landfill brought immediate, tangible results in controlling environmental impacts. Given these impressive achievements in improving the Balakhani site's management, the government decided not to close the site as originally intended but to upgrade the landfill further to serve the Greater Baku area for another 20 years.

What Did Not Work, and Why?

The project design at additional financing focused almost entirely on civil works to upgrade the landfill. After five years of the engagement and significant progress made on sector diagnostics and capacity building, the team could have raised ambition and followed through to ensure other critical interventions take place, like building the transfer stations to address illegal dumping and defining and pursuing new outcome targets for the sector's institutional and policy reform. The envisaged phased approach at appraisal was not followed through in the project design at additional financing. The project team continued the dialogue on financial sustainability throughout the engagement, but it was not sufficiently effective to set the momentum on the reform's critical aspects. The project also fell short of introducing communication campaigns and trainings for public officials to help strengthen accountability and address the practice of illegal dumping.

The Independent Evaluation Group's project ratings are described appendix A. Appendix C describes the evaluation methodology and evidence sources.

Lessons

This Project Performance Assessment Report offers the following lessons:

- Significant spending on modern waste facilities alone is not sufficient to ensure an effective MSW disposal system. Nearly 50 percent of the waste collected in Greater Baku fails to reach the authorized treatment and disposal facilities (the Balakhani sanitary landfill, upgraded under the World Bank project) and the materials recovery and waste-to-energy facilities (built by the government outside the project scope). Despite the success in improving waste collection under the project, a significant proportion of the collected waste is dumped informally. Continued illegal dumping in Greater Baku undermines the efficiency for a large share of waste to be processed, treated, or recycled. The treatment and disposal facilities are operating at half capacity and entail high capital and operating costs. Lack of appropriate financial and institutional

incentives to deliver waste to treatment and disposal, ineffective enforcement, and weak accountability can undermine the effectiveness of the entire chain, from waste collection and transportation to final disposal. Solutions to integrate the interrelated processes in the SWM chain are critical.

- Closing illegal dumps is likely to be ineffective without complementary measures to strengthen institutional accountability and achieve behavior change. Cleaning up dump sites requires a holistic approach that involves addressing both causes that created dump sites in the first place and promoting behavioral change. Closing illegal dump sites did not eliminate the practice of waste dumping, and uncontrolled disposal continues in the peri-urban areas of Baku. These unsustainable practices generate continuous contamination of water, soil, and air and pose health risks to residents. The government still needs to find ways to provide incentives for transporting waste to the authorized treatment and disposal facilities. International experience also highlights the importance of public awareness and outreach in proper waste disposal to help eradicate illegal dumping.
- It is important to think through the sequencing of sector interventions in unreformed sectors to prioritize interventions that ensure a minimum threshold of viability and reforms that may enable meaningful progress. When this investment project started, it correctly prioritized the sector diagnostics first and carried out basic critical investments to address the most immediate environmental concerns. That was highly positive. Beyond that, however, it would have been important to focus further efforts and political leverage on key policy and institutional reforms to enable the sector to improve its performance in a sustainable way, most of them already highlighted by the initial diagnostics. Instead, and although still useful, the additional financing of the project focused on physical works related to the modernization of the landfill, missing the opportunity to raise the ambition and tackle those needed reforms to deal with the sector's binding constraints in the Baku metropolitan area. As seen across regions and countries, investment projects tend to be much more effective in delivering the expected results when the sector at an earlier stage has gone through a minimum threshold of reforms, which creates an enabling environment to absorb investments with favorable and sustainable development results.

José C. Carbajo

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Independent Evaluation Group

1. Background, Context, and Design

Background and Context

1.1 Azerbaijan is an upper-middle-income country rich in hydrocarbon resources. Since the 2000s, inflows of foreign direct investment to the oil and natural gas sectors have driven a surge in exports, propelling economic growth and reducing poverty. With a strong economic resurgence in the 2000s, the country experienced rapid urbanization in the capital city of Baku and in Sumgait, the second-largest city, located in the Absheron Peninsula. The Absheron Peninsula was heavily polluted by nearly 150 years of oil production, which contaminated approximately 30,000 hectares, 15,000 of which were of primary environmental concern. Rapid urban growth and weak management capacity caused sanitation and solid waste management (SWM) to deteriorate significantly.

1.2 The government of Azerbaijan set out priorities to address environmental risks and to liberate land needed for the rapid economic and demographic growth of the Absheron Peninsula. The government's Environment State Program for 2006–10, instituted by Presidential Decree 1697 on September 28, 2006, launched an ambitious plan for a comprehensive cleanup and remediation of existing disposal sites, improvement of hazardous and nonhazardous waste management practices, and development of forward-looking environmental management through renovating existing facilities, building new infrastructure, and improving laws and regulations. The reform agenda for the Greater Baku area was driven by an operational, financial, and legal restructuring of the SWM sector, including significant investments in collection and disposal infrastructure. The program also provided for construction of a waste-to-energy facility.

1.3 The main challenges for municipal solid waste (MSW) management and collection were lack of coverage, low service quality, lack of safe disposal options, and lack of financial sustainability.¹ Poorly managed solid waste was a highly visible environmental issue. Air pollution and smoke from the main dump site, Balakhani, could be seen in the capital city of Baku. Informal dump sites were numerous outside the central city, especially in the new settlements, where service coverage and quality were inadequate. Both the formal and informal disposal areas posed health risks to residents. The sector was financially unsustainable because of inadequate coverage of the billing system, weak enforcement, and low tariffs (World Bank 2008).

1.4 The solid waste collection system was fragmented. The institutional responsibility was determined by housing type, not geographic area. People living in individual houses were particularly underserved because the formal collection system

primarily served the traditional apartment buildings. The quality of collection was very low outside the Baku City Department of Housing and Communal Services' (DHCS) service area (that is, for people not living in the state-funded apartments). Outside central Baku, equipment availability was limited, and collection points were inadequately maintained.

1.5 The government of Azerbaijan requested support from the World Bank for an Absheron Rehabilitation Program, with SWM as one of the primary sectors. It reassigned the overall responsibility for managing solid waste to the Ministry of Economy, and the proposed World Bank project would support the government in operationalizing improvements in waste collection and disposal by developing a sound strategic plan further, implementing the necessary institutional reforms, and linking improvements in service coverage and quality with improvements in financing during the following three to five years, which would be the likely minimum period before a waste-to-energy facility (planned by the government outside the project financing) could become operational (World Bank 2008).

Objective, Design, and Financing

1.6 The Absheron Rehabilitation Program II Integrated Solid Waste Management Project was approved on June 17, 2008, for an International Bank for Reconstruction and Development (IBRD) loan of \$29.5 million “to support the reform of the Greater Baku solid waste collection and disposal operations into an effective and sustainable system” (Loan Agreement 7549-AZ, dated May 20, 2009). The Project Appraisal Document expanded on the details of the reform aspects, that is, “in the fields of (i) improving environmental conditions at the existing waste disposal sites, (ii) building-up operational, management, and communication capabilities, (iii) rollout of collection services, and (iv) data collection and planning” (World Bank 2008).

1.7 The second IBRD loan of \$47.1 million was approved on June 27, 2013, as part of project restructuring and additional financing to upgrade the Balakhani landfill with modern solutions, including landfill gas capture. The government initially envisioned closing the landfill after the construction of the waste-to-energy facility and to buy time for finding a new waste disposal location; thus the initial works were a temporary solution to manage environmental and health hazards arising from the landfill. However, because environmental management works under the original project proved successful, the government decided to extend the life of the landfill and modernize it further for sanitary disposal.

1.8 The project development objective was reformulated to improve clarity, without substantial changes to the outcome indicators, that is, “to support (i) improving solid

waste disposal management; (ii) increasing waste collection coverage; and (iii) enhancing waste data information and financial management capacity in the Greater Baku area” (World Bank 2014). The project closing date was extended by three years, from September 30, 2013, to September 30, 2016, to complete the additional activities (described under project components).

1.9 The project was structured in relation to five components (as reflected in the loan agreements).

1.10 Component 1: Institutional reform, capacity building, and project management (appraisal estimate: \$7.66 million, of which \$6.68 million was an IBRD loan; additional financing: \$2.12 million, of which \$1.8 million was an IBRD loan; actual cost: \$10.23 million). Component 1 supported (i) finalization of a strategic plan for the sector (which included analytical work to assess the existing systems, institutional reform, sector financing, funding, and cash flow management; development of a legal framework and institutional structure; development of rollout plans for waste collection services and involvement of the private sector; tariff and tariff collection reforms; development of accounting and data systems; and a strategy for dealing with medical and hazardous waste, planning for rehabilitation of disposal sites, and closure of informal dumps); (ii) provision of capacity-building and management support programs for practical management and operational skills in solid waste collection and disposal; (iii) provision of goods and consultants’ services for public awareness campaigns and a communication program; and (iv) strengthening the management capacity of the project management team to monitor and administer implementation of the project.

1.11 Component 2: Balakhani landfill rehabilitation and management (appraisal estimate: \$12.64 million, of which \$10.71 million was an IBRD loan; additional financing: \$48.14 million, of which \$40.8 million was an IBRD loan; actual cost: \$54.28 million). This component aimed to improve the capacity of an existing landfill for continuation of disposal activities in an operationally and environmentally sound manner. It financed equipment (weighbridges, bulldozers, and so on) and civil works (fencing, waste coverage, drainage control, internal roads, and so on) to control environmental impacts and improve site-use effectiveness while other SWM options were developed. Additional financing activities included full remediation and closure of the old waste disposal parts of the site, installing water and leachate controls, opening new waste cells at the existing site, and installing a methane gas capture system.

1.12 Component 3: Closure and management of informal dumps (appraisal estimate: \$7.55 million, of which \$6.4 million was an IBRD loan; additional financing: \$0; actual cost: \$14.96 million). Component 3 involved closure and cleanup of informal dumps through removal and transport of waste from all wild dumps, and the improvement of

management of formal sites, to minimize the negative environmental effects associated with informal or nonsanitary waste disposal.

1.13 Component 4: Urgent collection equipment (appraisal estimate: \$5.90 million, fully covered by government; additional financing: \$0; actual cost: \$6.40 million). Component 4 financed the provision of goods to increase the service quality and availability of solid waste collection coverage and service efficiency.

1.14 Component 5: Technical preparation of postproject investments (appraisal estimate: \$2.24 million, of which \$1.90 million was an IBRD loan; additional financing: \$5.31 million, of which \$4.50 million was an IBRD loan; actual cost: \$7.56 million). This component financed feasibility studies and environmental impact assessments needed to develop new landfill capacity and introduce transfer stations to maintain an effective enhanced waste collection and disposal system. Additional financing activities included feasibility studies for regional waste management systems and regional landfills outside the Greater Baku area, preparing a National SWM Strategy and implementation rollout plan, and preparing a national legal framework to improve SWM.

1.15 The project's theory of change was premised on establishing conditions for the reform of the Greater Baku SWM through a phased implementation. Project design focused on the urgent needs in primary waste management services, particularly domestic waste collection and disposal. Waste separation, waste minimization, and recycling remained outside the scope of the project because they were not expected to provide a primary solution to the urgent collection and disposal problems. A serious lack of sector data at appraisal made introduction of any reforms problematic (World Bank 2008).

1.16 Project outputs of the provision of new collection equipment were expected to improve access to regular solid waste collection services and increase residents' satisfaction with the MSW service delivery in Greater Baku. Rehabilitation of the main disposal site (Balakhani) in Greater Baku was to improve a disposal management system to meet acceptable environmental standards and create additional waste disposal capacity. Closure of informal dumps was to manage the contaminated land area. The collection of waste disposal data and capacity building of the new agency Tamiz Shahr joint stock company (JSC; responsible for the treatment and disposal services) was to enhance waste data and financial management and improve solid waste disposal management in Greater Baku. The project also planned to develop technical designs for subsequent investments, particularly transfer stations and construction of new regional landfills (figure 1.1). The institutional, policy, and regulatory reforms in the MSW sector were to be defined in the sector diagnostics studies under the project. However, there

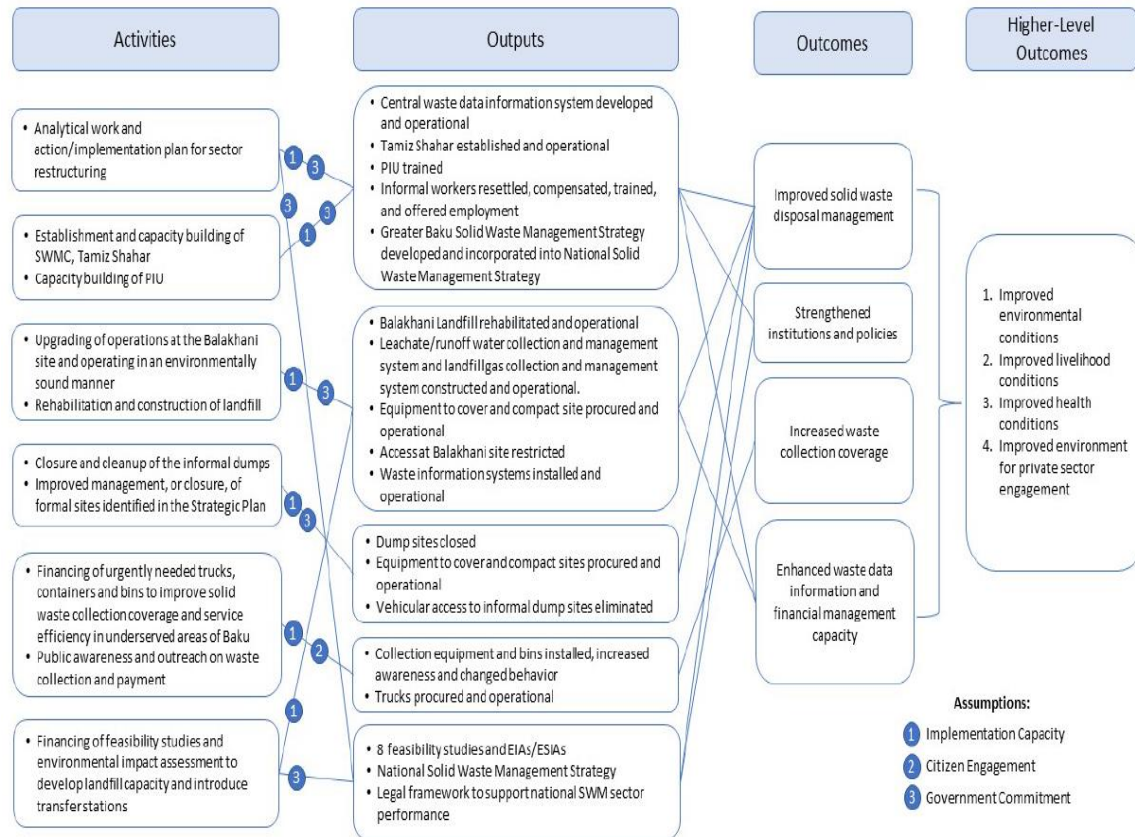
were no measured outcomes to capture the depth of interventions on the strengthened institutions and policies for MSW management in Greater Baku and Azerbaijan.

1.17 There was a logical gap in the theory of change in relation to the improvement in payment collection ratio in Greater Baku. The links between project activities and an increase in the bill collection ratio were not well established because there were no activities defined to achieve this outcome. The results framework in the Project Appraisal Document reflected that this was to be achieved through a new billing and payment plan, but the components focused only on the data collection on tariffs, fee billing, and payments (World Bank 2008). It was assumed that the increase in coverage brought about the increase in the collection ratio.

1.18 There were certain underlying assumptions for the success of the project interventions and continuity of the development outcomes. Financial sustainability was considered crucial. The project planned to develop a SWM strategic plan for the Greater Baku area, and a critical element was to be moving the sector toward financial sustainability. This included assessing tariff levels to determine structural and financial reforms that would be necessary to support reasonable collection and disposal service levels and to define tariff levels necessary to achieve economic sustainability, which was crucial for the investment to succeed. The government of Azerbaijan also needed to enforce the existing SWM and environmental regulations (World Bank 2008). But these assumptions did not materialize, despite the reported government commitment and strong implementation capacity. A follow-up engagement for future planned investments did not materialize, either.

1.19 The project closed on August 31, 2018, after 10 years of implementation. The two IBRD loans were fully disbursed at \$76.6 million. The total project cost (including physical contingencies) was \$97.1 million, which increased from \$41.5 million to finance additional activities and was reported as final. The borrower's commitment was \$12 million, which increased to \$20.5 million to include value-added tax financing. There was no cofinancing from other donors, but a parallel financing was carried out for the complementary analytical activities associated with regulatory strengthening in the solid waste sector and environmental work on the Balakhani landfill from the United Nations Development Program and a prefeasibility study of the sector financed by the European Bank for Reconstruction and Development. These studies were used in the National SWM Strategy prepared under the project.

Figure 1.1. Theory of Change



Source: World Bank 2019a.

Note: EIA = environmental impact assessment; ESIA = economic and social impact assessment; PIU = project implementation unit; SWM = solid waste management; SWMC = Solid Waste Management Company .

2. What Worked, What Didn't Work, and Why?

Results

2.1 The project contributed to improved management of the MSW sector in Greater Baku and Azerbaijan in the critical areas of collection, disposal, institutional reform, policy and regulatory environment, financial sustainability, and social inclusion.

Municipal Solid Waste Collection

2.2 The World Bank helped increase access to regular waste collection services to an additional 800,000 residents of Greater Baku by 2018. As reported, waste collection services covered 79 percent of the metropolitan population of Baku in 2018, up from 60 percent in 2008. New bins (6,345) were deployed throughout Baku's five outer districts, and 1,973 new collection points were created to provide supporting infrastructure for coverage expansion. Project beneficiaries' level of satisfaction with the

improved MSW collection services increased substantially from the baseline of 30 percent in 2012 to 68 percent in 2018 (World Bank 2019a). In 2020, 82 percent of generated waste was collected in Greater Baku. MSW generation in Greater Baku is estimated at 2.06 million tonnes, which is half of the MSW generated countrywide (see figure 2.1 and table F2.1.1). The rate of waste collection is much higher in the central districts of Baku (more than 95 percent) compared with the peri-urban areas.

Figure 2.1. MSW Generation and Collection in Greater Baku and Azerbaijan, 2020

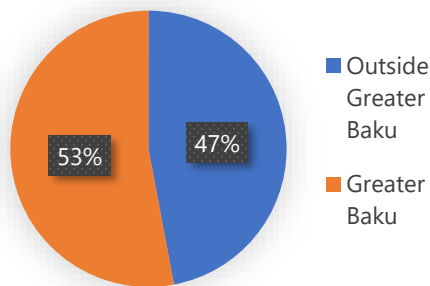


Table F2.1.1 MSW Generation and Collection, Azerbaijan, Greater Baku, and Outside Greater Baku, 2020

Area	Generation		Collection (t/y, millions)	Collection Efficiency (percent)
	(t/y, millions)	(percent)		
Azerbaijan	3.89	100	2.65	68
Greater Baku	2.06	53	1.70	82
Outside Greater Baku	1.83	47	0.95	52

Source: Aim Texas Trading LLC 2021.

Note: MSW = municipal solid waste; t/y = tonnes per year.

2.3 The MSW fee collection rate in Greater Baku was estimated at approximately 65–70 percent in 2018, and the city of Baku had a 45 percent collection rate (Aim Texas Trading LLC 2021).² As a result of the coronavirus outbreak in 2020, these rates may be lower. Under the project, the increase in the number of households paying for solid waste services was assumed based on the rollout of collection services rather than on applying a new billing and payment plan. The project carried out studies and data collection to understand the billing and payment processes to improve solid waste collection, which were used to form the recommendations in the SWM Strategic Plan for Greater Baku and subsequently the National SWM Strategy.

2.4 Barriers remain for improving the waste collection services in the Greater Baku area. The responsibility for the provision of waste collection services is fragmented. Waste collection and transport services are undertaken mainly by the Departments of Housing and Communal Services of the local executive authorities in Azerbaijan, including Greater Baku.³ Municipalities' participation in waste collection and transport is limited because they do not have the authority to provide these solid waste services (World Bank 2018). Municipalities were made legally responsible for SWM by law in 1999,⁴ but the actual transfer of responsibilities and financing has been lagging. Municipalities are de facto subordinated to the local executive authorities. The

Departments of Housing and Communal Services of local executive authorities made very little effort to cooperate with municipalities to involve them in waste management. Municipalities also lack knowledge, expertise, equipment, and financial resources. Often, housing associations (*zheks*) or large public entities, including state-owned enterprises, organize their own collection services. The overall system for raising and administering waste collection fees is weak, fragmented, and nontransparent; it is not clear to what extent the collected revenue is reinvested into the sector. As of 2018, 35 entities collect waste and tariffs: 15 government departments, 16 municipalities, 1 government JSC, and 3 private companies (one government department, Administration of Coastal Boulevard, does not collect tariffs; Aim Texas Trading LLC 2021).

2.5 Solid waste collection service levels are low outside the Greater Baku area. Secondary and tertiary towns remain critically underserved, and no official waste collection is carried out in villages and settlements. Fifty-two percent of the generated waste is estimated to be collected in the urban areas, and waste collection service is almost nonexistent for 47 percent of Azerbaijan's rural population (Aim Texas Trading LLC 2021). Collection services are only basic, are not monitored regularly, and have limited coverage. A broader institutional reform is required to address fragmented responsibilities, lack of incentives, and low capacity.

Municipal Solid Waste Disposal

2.6 The World Bank helped address **poorly** managed solid waste disposal in Greater Baku by transforming the main city dump into a well-managed sanitary landfill. The upgraded Balakhani landfill is the only sanitary landfill in the country (120 hectares of land). There was an urgent need to address an environmental failure of the city disposal site built in the 1960s. In 2008, air pollution, odors, and fire were reminders of the environmental blight in the Greater Baku area. The landfill needed a profound turnaround, and the World Bank acted with a set of cost-effective technical solutions that involved equipment, fencing, waste coverage, and drainage control to help control the environmental and health hazards arising from the landfill. The plan was to fix the issues temporarily and then close the landfill. However, based on the successful technical and operational measures provided under the project, the government decided to extend the life of the landfill and requested further support in 2013 to upgrade it with modern solutions, including landfill gas capture and a leachate collection system. An additional 9.7 million tonnes of capacity was created under the project.

2.7 Informal dump sites (132) were closed to minimize the negative environmental effects associated with nonsanitary waste disposal in Greater Baku. 40 dump sites were closed by the World Bank project (143 hectares), and 92 were closed by the government (56 hectares). Informal dump sites were numerous outside the central city, especially in

the new settlements, where service coverage and quality were inadequate. The closure of wild dump sites recorded impressive progress during the project period and corresponded to 199 hectares of the land recovery in the Greater Baku area. Five sites corresponding to 18 hectares were also cleaned because of contamination.

2.8 However, uncontrolled disposal continues in the peri-urban areas of Baku—an estimated 50 percent of the collected waste is dumped informally. A significant proportion of the collected waste in Greater Baku does not reach the treatment and disposal facilities. These unsustainable practices contaminate water, soil, and air and pose health risks to residents, including waste pickers on open dump sites. This continuation of past practice is largely attributed to nonavailability of waste transfer facilities in Greater Baku, a lack of financial incentives for operators to deliver waste to the new treatment and disposal facilities, and a lack of effective control mechanisms in place and effective enforcement.

2.9 The World Bank prepared feasibility studies to plan two transfer stations in the districts of Garadagh and Shuvalan to help prevent illegal dumping in Greater Baku. The construction of the two waste transfer stations in Baku was expected to increase collected waste being treated or disposed of properly and to reduce transportation costs. The transfer stations were designed, and their locations were determined and allocated, by local governments. Their respective environmental impact assessments were prepared and disclosed. The construction of transfer stations, however, was subsequently canceled for unclear reasons. There are currently no waste transfer facilities in Greater Baku, and the government still needs to find ways to provide incentives for transporting waste to the transfer facilities when built. Informal dumping continues in the peri-urban areas of Baku where the number of trucks is limited. Trucks regularly collect waste doing several collection trips; however, then they dispose of waste in their districts (usually former stone quarries or oil-polluted or former industrial sites), instead of traveling 70 kilometers to discharge at the sanitary landfill.

2.10 A concept of regional waste sheds in Azerbaijan was envisioned, but did not materialize. It was reflected in the National SWM Strategy, prepared with World Bank support. The project supported feasibility studies to improve solid waste disposal services throughout the country and establish regional landfills that could be financed under the subsequently planned operation. It prepared environmental and social impact assessments for the new regional landfills in the Absheron, Shabran, and Shamkir regions of Azerbaijan. The regionalization of disposal services outside Greater Baku was planned for eight waste sheds serviced by one regional landfill and supported by various international financial institutions. However, support from these institutions and the World Bank did not materialize,⁵ and there was no progress on the government side. The government decided to postpone borrowing from international financial

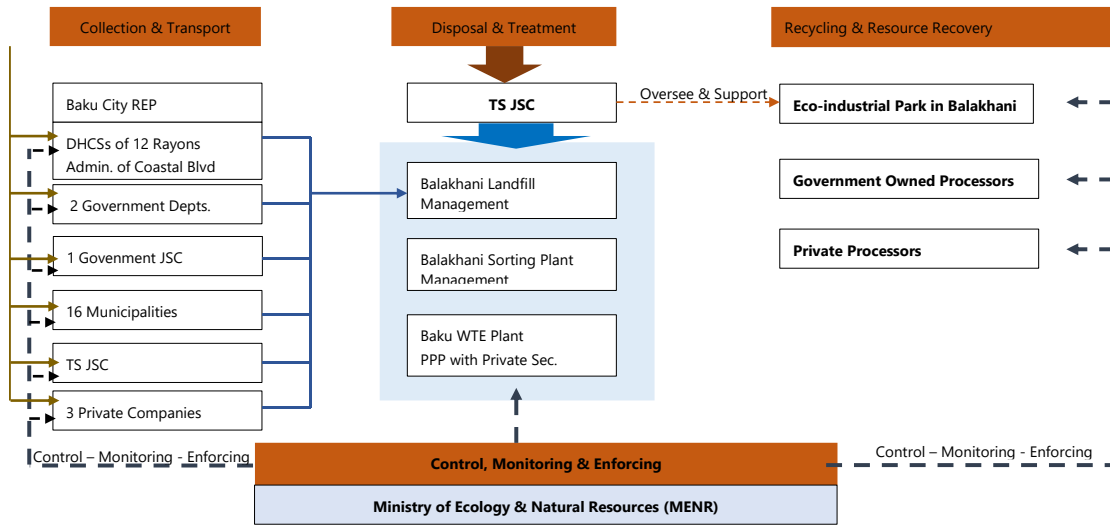
institutions. Disposal outside the big cities takes place at uncontrolled dump sites (approximately 1 million tonnes of waste are disposed per year). Dump sites are not managed and maintained to the acceptable international standards and pose significant adverse environmental and public health hazards (Aim Texas Trading LLC and ICP JV 2018). Azerbaijan has not yet transitioned to the regional SWM system.

2.11 The government supported the construction of new waste treatment facilities adjacent to the Balakhani landfill in Greater Baku, through its own financing. The facilities were built in 2012: a materials recovery facility with capacity to sort 200,000 tons of waste per year and a waste-to-energy plant, one of the largest facilities in Europe built in line with the European Union's most stringent environmental standards (10 hectares of land); it has a design capacity to use up to 500,000 tons of solid household waste and 10,000 tons of medical waste per year, and generate 231 million kilowatt-hours of electricity a year, supplying up to 300,000 people with electricity. The government consequently established an eco-industrial park in 2017—a public-private partnership promoting recycling and recovery activities—near the Balakhani landfill and the treatment facilities to facilitate the supply of raw materials and energy, including easy access of raw materials or products to the market. The park is offering tax privileges incentivizing recycling companies to operate and process the recyclables from the materials recovery facility. Because of these investments, Azerbaijan reached 35 percent of recovery of the waste received by the facilities. An estimated 18 percent is recycled formally and informally, and 17 percent is incinerated for energy recovery in the waste-to-energy plant (Aim Texas Trading LLC 2021).

Institutional Reform in Greater Baku

2.12 The World Bank supported the creation of a dedicated agency responsible for waste treatment and disposal services in Greater Baku. A new state-owned JSC, Tamiz Shahar (Clean City), was established in 2009 to manage all the assets related to solid waste recovery and disposal in the Greater Baku area. Tamiz Shahar JSC is responsible for the construction, commissioning, and operation of the Balakhani landfill (upgraded with World Bank support), the materials recovery facility, the waste-to-energy plant, and the eco-industrial park (see figure 2.2). The waste-to-energy plant is under a public-private partnership; in December 2008, Tamiz Shahar JSC awarded a design, construction, and operation contract for 20 years to Constructions Industrielles de la Méditerranée, a private operator.

Figure 2.2. MSW Institutional Framework in Greater Baku



Source: Aim Texas Trading LLC 2021.

Note: DHCS = Department of Housing and Communal Services; JSC = joint stock company; MSW = municipal solid waste; PPP = public-private partnership; REP = regional executive power; WTE = waste-to-energy.

2.13 Tamiz Shahar JSC has evolved into a professional public enterprise running the sanitary landfill and complex treatment facilities. The company has high technical capacity and expertise and carries out the daily operations and management functions efficiently. The sanitary landfill and treatment facilities are reported to be generally well maintained. The World Bank supported capacity building of the company's staff in various technical, operational, and administrative areas, including financial management and data monitoring. Forty-two Tamiz Shahar JSC employees took part in local and foreign trainings associated with the project. The original plan was to consolidate both waste collection and disposal systems gradually in one new entity. Pilots were conducted with collection services in the Gala and Turkan settlements and in the Icheri Shahar (old town) part of Baku. In the Gala settlement, the company introduced separate collection, transportation, and use of organic and inorganic waste with 151 waste collection sites equipped with two-color waste containers (Tamiz Shahar JSC 2021). The company, however, has not yet evolved to assume broader MSW collection and transport responsibilities in Greater Baku and currently does not have a strategic and decision-making function.

2.14 The World Bank helped establish the basic data collection for solid waste disposal and treatment in Greater Baku. In 2008, the MSW sector had a serious lack of data, and the project included substantial support to develop robust management information systems, particularly for data collection, measuring solid waste streams (weighing bridges at disposal sites), and financial performance (billing and payment ratios). The project team recognized that data recording (waste volumes, waste

composition, and financial data) and the availability of metered and reliable data are fundamental in the development of the new waste management system, performance monitoring, and routine operational optimization of collection and disposal systems. Significant progress has been made with the provision of reliable information related to the treatment and disposal waste quantities in Greater Baku (waste volumes, waste composition, and financial data). The waste information system operated by Tamiz Shahar JSC is compiling data from multiple entry points and sources to ensure performance monitoring.

2.15 However, Tamiz Shahar JSC faces operational limitations. Both treatment facilities (materials recovery and waste-to-energy) that the government built and Tamiz Shahar JSC manages are operating significantly below capacity because of a low share of waste received relative to the amounts generated. In 2017, Tamiz Shahar JSC received 643,000 tonnes from an estimated 1.2–1.3 million tonnes of the municipal waste collected in Greater Baku, or approximately 50 percent. There was no substantial increase in the amounts received at Tamiz Shahar JSC since then (Aim Texas Trading LLC 2021). The materials recovery facility is working at an average efficiency of approximately 40 percent (see appendix E).

2.16 The treatment facilities have high capital and operating costs, and the company receives significant subsidies from the state budget to offset low tariffs and inadequate waste received at the facilities. Tamiz Shahar JSC has its own revenue stream from a landfill gate fee, sales of recyclables to processors, and sales to the state energy company (Azerenergy) of electricity generated by the waste-to-energy plant. Based on the analysis of Tamiz Shahar JSC's financial records for 2015–17, the share of revenues from selling electricity was 60 percent of the total revenue, on average. However, the income from electricity sales covered only 19 percent of the waste-to-energy plant's operating costs during the same period (Aim Texas Trading LLC 2021).

Sector Policy and Regulatory Environment

2.17 The World Bank bridged the gap in sector diagnostics to support decision-making and policy action in MSW management in the country. The team carried out multiple studies and detailed assessment of the MSW sector in the Greater Baku area and Azerbaijan. One-quarter of the project financing was in institutional strengthening and policy development of the MSW sector in Azerbaijan (\$18 million). In 2008, the sector had a critical need for basic sector data, such as waste volumes, waste composition, demographic data, inventories of equipment, costs of waste collection and disposal, tariffs, fee billing, payments, data on local authorities (municipalities) and their role in SWM, inventories of waste dumps, and legal requirements. The World Bank produced multiple feasibility and technical studies and environmental and social impact

assessments, and subsequently produced three distinguished reports: the *SWM Private Sector Participation Strategy Paper* (2012), financed through a grant from the Public-Private Infrastructure Advisory Facility; the *Greater Baku SWM Strategy* (2014); and the *National SWM Strategy* (2017). These sector analytics and data established a critical platform to serve for decision-making and as a key tool for policy action.

2.18 The National SWM Strategy, developed with World Bank support, was approved by a presidential decree in 2018. The strategy offers an approach to address key sector challenges nationwide and sets a detailed, phased road map to enhance the sector and its performance. It focuses on improving core collection services and disposal processes to diminish illegal dumping, and it envisioned the need for regionalization of disposal services outside Greater Baku. The key to the sector's sustainable institutional and financial setup is the need to improve tariff collection rates and revenue collection and diminish the sector's reliance on the state budget, strengthen institutional performance, and improve the regulatory and control functions of relevant institutions. Introducing adequate waste accounting, monitoring, and reporting, along with enforcement mechanisms for noncompliance (such as illegal dumping), are also recommended.

2.19 There has been some progress in the implementation of the National SWM Strategy, albeit slow. External factors such as the conflict with Armenia and the global COVID-19 pandemic in 2020–21 also affected the pace of implementation as government priorities shifted to address these immediate concerns. A broader institutional reform of the sector and other critical steps in improving SWM have yet to materialize. The institutional framework is fragmented, and although a central coordinating body was envisioned, it has not yet been created. The Ministry of Economy emerged as the leading ministry for the SWM policy formulation and strategic planning under the project. It is a primary coordinating authority for the actions to be taken under the National SWM Strategy during the first phase of implementation of 2018–22. MSW data at the national level are not monitored, including those for environmental impacts (air, soil, and water pollution), and there is no accurate or complete data on the full costs of waste services. The legal framework leaves room for interpretation and makes it hard to develop coherent SWM plans. Generally, no waste management or business plans exist to define service standards or performance targets. The government has been undertaking several measures to start implementing the priorities set out in the National SWM Strategy. These include preparing drafts of regulatory and legal documents to expand the institutional responsibilities of Tamiz Shahr JSC to the national level, improving outreach with the local authorities on MSW management and raising awareness about illegal dumping, introducing regulatory measures regarding plastics and sanitary disposal, and developing a national SWM information system, similar to the one

developed by Tamiz Shahar JSC for Greater Baku, with the World Bank support (Tamiz Shahar JSC 2021).

2.20 The World Bank developed the Greater Baku SWM strategy and the SWM private sector participation strategy to offer an approach to address key sector challenges nationwide. The Greater Baku SWM strategy was reportedly merged with the National SWM Strategy of 2018. The SWM private sector participation strategy identified the possibility and feasibility of engaging the private sector in SWM operations in Azerbaijan (COWI 2012). It correctly identified the lack of economic and financial incentives for the private sector as a main reason for the low private sector participation in SWM in Azerbaijan. As described, the basic principles of SWM financing were not in place—a unified tariff was set at the national level, revenue collection rates were low, budget allocation was unclear, and transfers and cross-subsidies to the sector were high. Waste collection could be a potentially attractive market for private operators, but under such circumstances and because of high institutional fragmentation, private sector interest was low. Waste collection contracts were based not on clearly assigned and defined geographical areas but on individual contracts with waste generators. Overall, the sector was broadly underfunded and did not cover the cost of private operators. Given high fragmentation and small-scale operations, economies of scale were low. The existing procurement rules did not reflect international practices in procuring waste management services from the private sector. In addition, the capacity of contracting public sector entities at the local and regional levels was low, which made it difficult to procure services from the private sector and monitor performance (COWI 2012).

2.21 Currently, the public sector provides almost all MSW services. The private sector plays a limited role in waste management, though the government contracted a foreign company for the design, building, and operation of the waste-to-energy plant in Greater Baku. The government does not regulate the recycling sector. One of the most prominent reasons for lack of the private sector involvement in the MSW management sector is low tariffs. Private waste collection companies cover a minor share of the waste collection market (1.5–2 percent). This rate is higher in the recycling sector, though the exact rate is unknown because of the lack of a recording and registration system in the recycling sector (Aim Texas Trading LLC 2021). Between 14 and 19 private companies are operating in the eco-industrial park, buying recyclables for further manufacturing. However, the separation of recyclables from the materials recovery facility did not lead to the creation of a recycling market for the private sector. The expected cascading effect could not be created because the private sector involvement in the MSW sector in Azerbaijan is not adequately regulated and supported by comprehensive government policies.

Sector Financial Sustainability

2.22 The World Bank sustained a dialogue on the reforms needed to improve the SWM sector's financial performance. Its recommendations were set to broadly prioritize reform of the financial flows to create the right set of incentives, strengthen the oversight functions of inspectorate bodies, and enhance the efficiency of operations. Attaching the waste fee to the electricity bill (as proposed by the National SWM Strategy) was expected to improve the fee collection rate, bring transparency in the flow of funds and their use, provide an incentive for collection and transport operators, and reduce the occurrence of illegal dumping. Although this might not initially bridge the funding gap fully, it was expected to reduce government subsidies and allow for a gradual move toward full cost recovery. The government has not yet embarked on the critical structural reforms to move the sector toward financial sustainability.

2.23 The SWM sector in Azerbaijan remains highly subsidized by the state budget. The tariffs and tariff collection rates are low, and collected charges and expenditure of budget transfers for services—including waste management—are inadequately administered. It is not clear to what extent collected revenue is reinvested into the sector. The country has an official waste tariff (estimated at 0.12 percent of the average household income), but some districts are assigning different tariffs on their own to reach the required cost recovery level. The state has been allocating significant subsidies to finance recurrent costs in addition to the capital investment financing. In Greater Baku, the state budget finances 80 percent of costs. The costs in Baku are substantially higher than in the rest of the country because of the operation of the modern treatment facilities and sanitary landfilling, after the rehabilitation of the Balakhani landfill.

Social Inclusion

2.24 With the Balakhani landfill upgrade, informal waste pickers were incorporated into the formal economy. The project team prepared a program to include waste pickers from the landfill in formal waste-picking activities at the materials recovery facility. Accordingly, a comprehensive resettlement action plan was prepared and implemented in 2011 and 2012. The project established a robust baseline of waste pickers, their assets, and their incomes, and consistently monitored them, including compiling primary information from the interviews and discussions with project-affected persons in each report. Six families living at the landfill site were provided with new housing. The waste pickers received trainings and compensation and were offered employment at the materials recovery facility, along with the official social and medical benefits under the Azerbaijani legislation. However, only 14 of the 100 to 110 waste pickers accepted Tamiz Shahar JSC's proposal and began to work at the facility. Waste pickers reportedly stated that adhering to the eight-hour workday did not suit their preferences. Currently, as

confirmed by the Independent Evaluation Group mission, only 11 waste pickers from those who were waste picking before the landfill rehabilitation are working at the Balakhani material recovery facility as employees of Tamiz Shahar JSC. Some waste pickers preferred to continue operating at the landfill but under the environmentally sound, safe, and secure conditions. As confirmed by Tamiz Shahar JSC, waste picking has been allowed in a controlled environment with registration, monitoring, and safety equipment in place. Tamiz Shahar JSC also pays waste pickers for collected plastic, glass, and paper at the landfill site.

Design and Preparation

What Worked?

2.25 High-level political commitment. The government was committed to mitigating the environmental degradation in the capital city of Baku by addressing the SWM. It developed an ambitious vision for the sector and set out clear priorities for the investments and institutional reforms. In addition to rehabilitating the Balakhani landfill with World Bank support, the government made its own investments in the treatment infrastructure, including a materials recovery facility and a waste-to-energy plant that is now operating through a public-private partnership. It envisioned a dedicated SWM agency to manage these facilities, which was supported under the World Bank project. The government vision was to develop Balakhani as Greater Baku's principal recycling, recovery, and waste management center.

2.26 Well-targeted and balanced interventions. The project focused on the targeted interventions of reestablishing infrastructure and basic services in Greater Baku, with realistic targets set in the context of a significant sector data gap. It used a selective approach within the broader government agenda. The project also carved out sufficient funding to support institutional strengthening and capacity building. During preparation, the driving force behind the project was the urgency to rehabilitate the Balakhani dump site to prevent further environmental damage and increase waste collection from the outer districts of Baku. In parallel, the government was launching the construction of a waste-to-energy plant. The project was designed to address the primary needs of solid waste collection and disposal in Greater Baku while developing sector analytics and data to build the platform for future planning and reform.

What Didn't Work?

2.27 A logical gap between activities and the targeted outcome. The project targeted the increase in the household bill collection ratio through rolling out a new billing and payment collection system, as defined in the results framework at appraisal (World Bank 2008). The team explicitly recognized a risk that the government would not be able

to improve payment collection in line with the improvements in service delivery, meaning the sector would remain unsustainable. The project was structured “so as to combine improvements in collection coverage with better billing systems, more enforcement, and sustainable tariffs,” as described to mitigate the risk of a lack of financial sustainability (World Bank 2008). However, the project did not define specific activities in the components that would be expected to increase the bill collection ratio, besides the analytical work and data collection on tariffs, billing, and payments. The increase in collection ratio was assumed based on the increase in coverage in the end. At the same time, the World Bank has sustained the dialogue on the sector’s financial sustainability, which includes the proposal to attach the waste fee to the electricity bill to help improve the fee collection rate.

2.28 The project design at additional financing focused almost entirely on physical works to upgrade the landfill (87 percent of the second loan). After five years of engagement and significant progress on sector diagnostics and capacity building, the team could have raised ambition and ensured other critical interventions take place, like building the transfer stations to address illegal dumping and defining and pursuing new outcome targets for the sector’s institutional and policy reform. The envisaged phased approach at appraisal was not included in the revised project design at additional financing.

Implementation and Supervision

What Worked?

2.29 **Early emphasis on capacity building and continuous collaboration with the government on key policy directions.** Because of the lack of previous experience with World Bank–financed projects, there was a strong emphasis on building the project management team’s capacity for relevant functions that facilitated an effective implementation of the project technically and regarding processes. The capacity built under the project also led to a broader professional impact—the project team staff secured well-regarded, high-level positions in the government and the private sector after project closure. The project was also instrumental in building Tamiz Shahr JSC’s capacity, financing numerous technical study tours, knowledge exchange with regional utilities, and technical and financial studies. The World Bank also prioritized continuous collaboration and work with the national authorities to ensure the development and subsequently approval of key documents that constituted the long-term strategy for MSW sector development.

2.30 **Some tangible results with demonstration effects.** The original intention was to close the Balakhani landfill site because of the significant environmental liabilities. The

government subsequently decided to upgrade the landfill to serve the Greater Baku area for another 20 years, given the impressive achievements in improving the Balakhani site's management since 2009—that is, the successful management to optimize the system, minimize costs, generate economies of scale, and minimize negative environmental impacts. Successful cost-effective technical solutions that the World Bank introduced to turn the landfill around brought immediate, tangible results in controlling environmental impacts. The Balakhani landfill upgrade also brought about urban transformation in the capital city of Baku, becoming a symbol of environmental renewal.

What Didn't Work?

2.31 Lack of effective leverage on the sector financial sustainability. The World Bank correctly identified and brought the sector financing to the top of the policy dialogue agenda during implementation. The project identified financial sustainability as a risk for project investments and results and recognized that financial viability is critical for the sustainability of improved service delivery (World Bank 2008). During implementation, the project helped identify reasonable responsibilities of the entities at different levels and determined the structural and financial reforms necessary to support sector viability, including attaching the waste fee to the electricity bill to improve the fee collection rate and bring transparency in the flow of funds and their usage. These were adopted in the National SWM Strategy prepared under the project. There has been no progress on the financial reform's critical aspects yet. The World Bank did not resort to its other lending or legal instruments to use additional leverage to help push the agenda forward; per the team's comments, these were not perceived to be effective. At the same time, the government holds discussions on the MSW tariff reform, and the World Bank continues to be engaged in the postproject dialogue (Tamiz Shahar JSC 2021).

2.32 Lack of focus on institutional accountability and behavior change in addressing illegal dumping. The key to successfully eliminating or reducing the practice of illegal dumping is working with public officials to strengthen accountability and increasing public awareness. This was a first-generation project in MSW management that focused on infrastructure development and included substantial policy dialogue and institutional strengthening, but it lacked sustained public outreach initiatives. The project fell short of introducing communication campaigns and trainings to help support accountability and behavior change. Cleaning up dump sites requires a holistic approach, which involves both (i) addressing the causes that created dump sites in the first place, and (ii) promoting a behavioral change among key stakeholders at the municipal and community level to reduce the practice of illegal dumping. Public awareness and outreach are still very weak in Azerbaijan, as are enforcement and monitoring.

3. Lessons

3.1 Significant spending on modern waste facilities alone is not sufficient to ensure an effective MSW disposal system. Nearly 50 percent of the waste collected in Greater Baku fails to reach the authorized treatment and disposal facilities (the Balakhani sanitary landfill, upgraded under the World Bank project) and the materials recovery and waste-to-energy facilities (built by the government outside the project scope). Despite the success in improving waste collection under the project, a significant proportion of the collected waste is dumped informally. Continued illegal dumping in Greater Baku undermines the efficiency for a large share of waste to be processed, treated, or recycled. The treatment and disposal facilities are operating at half capacity and entail high capital and operating costs. Lack of appropriate financial and institutional incentives to deliver waste to treatment and disposal, ineffective enforcement, and weak accountability can undermine the effectiveness of the entire chain, from waste collection and transportation to final disposal. Solutions to integrate the interrelated processes in the SWM chain are critical.

3.2 Closing illegal dumps is likely to be ineffective without complementary measures to strengthen institutional accountability and achieve behavior change. Cleaning up dump sites requires a holistic approach that involves addressing both causes that created dump sites in the first place and promoting behavioral change. Closing illegal dump sites did not eliminate the practice of waste dumping by many communities, and uncontrolled disposal continues in the peri-urban areas of Baku. These unsustainable practices generate continuous contamination of water, soil, and air and pose health risks to residents. The government still needs to find ways to provide incentives for transporting waste to the authorized treatment and disposal facilities. International experience also highlights the importance of public awareness and outreach in proper waste disposal to help eradicate illegal dumping.

3.3 It is important to think through the sequencing of sector interventions in unreformed sectors to prioritize interventions that ensure a minimum threshold of viability and reforms that may enable meaningful progress. When this investment project started, it correctly prioritized the sector diagnostics and carried out basic critical investments to address the most immediate environmental concerns. That was highly positive. Beyond that, however, it would have been important to focus further efforts and political leverage on key policy and institutional reforms to enable the sector to improve its performance in a sustainable way, most of them already highlighted by the initial diagnostics. Instead, and although still useful, the additional financing of the project focused on physical works related to the modernization of the landfill, missing the opportunity to raise the ambition and tackle those needed reforms to deal with the

sector's binding constraints in the Baku metropolitan area. As seen across regions and countries, investment projects tend to be much more effective in delivering the expected results when the sector, at an earlier stage, has gone through a minimum threshold of reforms, which creates an enabling environment to absorb investments with favorable and sustainable development results.

Notes

¹ Municipal solid waste is generated mainly by residential and commercial sources in the country and is classified in two main categories: biodegradable and nonbiodegradable. Biodegradable waste is food waste, paper, plants, and wooden fractions, and nonbiodegradable waste is plastics, glass, and metal. Note that construction and demolition waste is not managed within the municipal waste in Azerbaijan.

² The Baku City Executive Authority collected waste fees of \$4,711,294 from 1,013,200 residential subscribers (population, not number of households) and 24,600 other customers in 2018. Baku City's population was 2,262,600 in 2018, and 44.8 percent of fee collection was achieved by the Baku Executive Authority.

³ The local executive authorities (LEAs) govern regions, cities, and city districts (rayons). The LEA is an extension of executive power headed by the president. LEAs do not have common representation. The president appoints each head of LEA, who is subordinated to the president through the presidential administration. The Provision on Local Executive Authority, adopted on 16 June 1999, determines the legal status of local state administration in Azerbaijan. In June 2012, the president approved the new regulation that granted additional powers to the LEAs, strengthening their dominant position in Azerbaijan's local affairs. LEAs coordinate the activities of municipalities and territorial divisions of state administration, among other responsibilities. LEAs can be referred to as a local tier of government only nominally because they do not have independence and simply implement the central government's decisions. For more information, visit <https://portal.cor.europa.eu/divisionpowers/Pages/Azerbaijan.aspx>.

⁴ Municipalities in Azerbaijan were created by law in 1999 and started to operate in 2000 with elected mayors and city councils. The actual transfer of responsibilities and financing has been lagging, however, and the role of municipalities is limited. The municipalities do not yet have adequate authorization under the Law on Industrial and Domestic Wastes or the capacity to participate significantly in the solid waste sector. The current framework leaves municipalities little discretion over a significant portion of the responsibilities granted to them by the Law on the Status of Municipalities in 1999. Funding from state budgets goes directly to the LEAs, which are responsible for submitting proposals to the state rather than municipalities. Municipalities are de facto subordinated to the LEA. No substantial public administration reforms have taken place since Azerbaijan gained its independence in 1991. Neither municipalities nor LEAs can make decisions independently. Because of the lack of finances and political and administrative powers, municipalities cannot decide on local issues. The LEAs cannot make decisions independently and usually consult the central government before making decisions. See <https://portal.cor.europa.eu/divisionpowers/Pages/Azerbaijan.aspx> for more information.

⁵ Currently, there is only one investment project, financed by the European Bank for Reconstruction and Development (EBRD), to improve solid waste collection services in the city of Ganja, Azerbaijan. The project entails buying new collection vehicles and bins, implementing a smart collection system, and improving maintenance bays and the dump site area. The project's total cost is estimated at up to 10 million euros, to be funded by EBRD on a sovereign loan basis. Ganja is the first city in Azerbaijan to join the EBRD Green Cities Program. As part of this program, EBRD collaborates with cities to identify, prioritize, and implement vital sustainable infrastructure projects.

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Appendix A. Ratings

Absheron Rehabilitation Program II Integrated Solid Waste Management Project

Table A.1. ICR, ICR Review, and PPAR Ratings

Indicator	ICR	ICR Review	PPAR
Outcome	Highly satisfactory ^a	Satisfactory	Satisfactory
Bank performance	Satisfactory	Satisfactory	Satisfactory
Quality of monitoring and evaluation	Substantial	Substantial	Modest

Sources: World Bank 2019a, 2019b.

Note: The Implementation Completion and Results Report (ICR) is a self-evaluation by the responsible Global Practice. The ICR Review is an intermediate Independent Evaluation Group product that seeks to independently validate the findings of the ICR. PPAR = Project Performance Assessment Report.

a. The outcome rating in the ICR is not derived correctly and should be satisfactory, based on the high relevance, substantial efficacy, and high efficiency.

1. Relevance of the Objectives

Objectives

Original Objective

The project development objective (PDO), as stated in the loan agreement (schedule 1, page 6), is “to support the reform of the Greater Baku solid waste collection and disposal operations into an effective and sustainable system.”

The PDO, as stated in the Project Appraisal Document, expanded on the details of the reform aspects: “to support the reform of the Greater Baku solid waste collection and disposal operations into an effective and sustainable system in the fields of (i) improving environmental conditions at the existing waste disposal sites; (ii) building-up operational, management, and communication capabilities; (iii) rollout of collection services; and (iv) data collection and planning” (World Bank 2008, 5–6).

Revised Objective

The original PDO was revised after the additional financing was approved on June 27, 2013. The revised PDO was “to support (i) improving solid waste disposal management; (ii) increasing waste collection coverage; and (iii) enhancing waste data information and financial management capacity in the Greater Baku area” (World Bank 2014, schedule 1, 6).

A split rating was not warranted because the PDO was revised for clarity to define the reform areas of support, and the outcome indicators were unchanged in substance during the additional financing project restructuring.

Relevance of the Objectives

This project was conceived as part of the Absheron Rehabilitation Program (ARP), a programmatic series of projects and advisory services that responded to the government of Azerbaijan's request for World Bank support for the Environmental State Program 2006–10. This project was one of three projects aimed at curtailing environmental degradation in the Absheron Peninsula. It was a comprehensive plan involving cleanup remediation, handling of hazardous and nonhazardous waste, and forward-looking environmental management through renovating facilities and improving laws and regulations. ARP I and ARP III were to rehabilitate contaminated sites and included cleanup activities at two former iodine production sites, land remediation, and oil recovery activities. The government subsequently completed these on its own, without World Bank financing.

The revised PDO was relevant to the government's Third State Program of Social and Economic Development of Regions for 2014–18, aimed at reducing regional inequalities and providing households with reliable public services (including solid waste collection). The revised PDO remained relevant to the objectives of the Country Partnership Framework for 2016–20, which aimed to contribute to improved human development outcomes through better access to water, sanitation, and communal services.

ARP II included a reform of the Greater Baku solid waste collection and disposal operations. The reform agenda was driven by a comprehensive operational, financial, and legal restructuring of the sector in the Baku area, including significant investments in collection and disposal infrastructure. However, the revised PDO was not formulated at a level to reflect the intended institutional reform and policy development of the solid waste management (SWM) sector, aside from improving solid waste disposal management (measured through creation of additional land capacity for disposal), increasing collection coverage, and enhancing waste data.

Relevance of the objectives is rated **substantial**.

2. Efficacy

Objective 1: To Improve Solid Waste Disposal Management

Theory of change. The upgrade of the Balakhani landfill was to lead to the disposal operation being run in an environmentally sound manner and to create additional disposal landfill capacity in Greater Baku. The closure of informal dumps was to help manage the contaminated land. All of these improvements, along with the establishment of a new SWM company responsible for the waste treatment and disposal services in Greater Baku and the municipal solid waste (MSW) sector diagnostics for future planning and reforms, were expected to lead to improved solid waste disposal management. However, the results from these important institutional strengthening and policy reforms were not sufficiently captured at the outcome level, which only measured additional landfill capacity and land area of the closed illegal dumps.

Outputs

- The Balakhani landfill was rehabilitated and upgraded to a sanitary landfill for a 20-year lifespan. The leachate and runoff water management system and the landfill gas collection system were installed and operational at the Balakhani landfill, as targeted.
- One hundred and thirty-two dump sites were closed at project closure. Per the borrower's comments and subsequent clarification from the team, 40 dump sites were closed under the World Bank project (slightly lower than the revised target of 50), and 92 were closed by the government. Five contaminated dump sites were cleaned, as planned.
- Tamiz Shahar joint stock company (JSC), responsible for solid waste treatment and disposal services, was established in Greater Baku, as planned.
- Three more strategies were developed as planned: the Greater Baku SWM strategy, the SWM Private Sector Participation Strategy (financed through a grant from the Public-Private Infrastructure Advisory Facility), and the National SWM Strategy. The National SWM Strategy was approved via a presidential decree in 2018.
- Eight feasibility studies and environmental impact assessments for new SWM systems were completed at project closure, as targeted.

Outcomes

- Landfill capacity of 9.7 million tons was created at project closure, as targeted.

- Overall, 132 dump sites were closed during the project period, corresponding to 199 hectares (core indicator). Forty dump sites closed with the support of the World Bank correspond to 143 hectares, close to the revised target of 154.18 hectares. The practice of illegal dumping, however, continues.

Solid waste disposal management was improved in Greater Baku through transforming the main city dump into a well-managed sanitary landfill with additional disposal capacity, closing of illegal dumps, establishment of the dedicated agency to provide waste treatment and disposal services, and preparing the sector strategies for Greater Baku and Azerbaijan, with adoption of the latter. The closure of illegal dump sites, however, did not eliminate the practice of waste dumping in the peri-urban areas of Baku, where some trucks dump waste after collection in their districts, rather than taking them all the way to the sanitary landfill. An estimated 50 percent of the collected waste is dumped informally and fails to reach the Balakhani sanitary landfill and treatment facilities. The planned construction of the transfer stations to shorten the distance for trucks to dispose of waste and new regional landfills has not yet materialized, after the feasibility studies prepared under the project.

The president approved the National SWM Strategy via a presidential decree on November 1, 2018. The strategy mandates that the tariff for SWM be increased in a phased approach over the planned implementation period. The first phase is defined for 2018–22. The plan also mandates that the SWM tariff be included in the utility bill instead of collected separately to ensure that the collected resources are channeled back into the waste sector. There is some progress in implementation of the National SWM Strategy, albeit slow. The government has not yet undertaken additional critical reforms in the sector. External factors such as the conflict with Armenia and the global COVID-19 pandemic in 2020–21 also affected the pace of implementation, as government priorities shifted to address these immediate concerns. Among the current activities in solid waste is a project in the city of Ganja under the European Bank for Reconstruction and Development Green Cities Program, along with public transport and street lighting investments.

Overall, the World Bank helped improve solid waste disposal management to a substantial extent. It successfully transformed the old dump into the sanitary landfill in the capital city of Baku, which is the only one in the country, and established a highly effective agency responsible for MSW disposal in Greater Baku. The World Bank bridged the gap in sector diagnostics to support decision-making and policy action in the MSW management in the country. The National SWM Strategy was adopted and is under implementation, albeit slow. The closure of illegal dump sites did not address the issue of illegal dumping, since new dumps are still forming, and this support did not prove to be sustainable. The construction of transfer stations was planned outside the

project scope (with feasibility studies done under the project), which have not been built. Their construction was considered critical to help eradicate illegal dumping, along with strengthening enforcement and accountability.

The PDO 1 efficacy rating is **substantial**, with moderate shortcomings.

Objective 2: To Increase Waste Collection Coverage

Theory of change. Deploying bins in Baku's outer regions and creating new collection points were to ensure the increase in waste collection coverage. The links between project activities and an increase in the bill collection ratio were not well established because there were no activities defined in the components to achieve this outcome, besides producing analytical work and data collection on tariffs, billing, and payments. However, the results framework explicitly stated that this was to be done through a rollout of a new billing and payment plan (World Bank 2008). The increase in the number of households paying for solid waste services was assumed based on the rollout of collection services rather than on applying a new billing and payment system in the Implementation Completion and Results Report (ICR).

Outputs

- The project distributed 6,345 bins in five outer districts of Baku at project closure. This exceeded the revised target of 6,000 bins.
- The equipment for solid waste collection was provided in Baku's five outer districts, as targeted.

Outcomes

- Solid waste collection services were received regularly by 2,774,416 beneficiaries at project closure. This exceeded the revised target of 2,700,000 beneficiaries. Of these, 1,414,952 were female. This exceeded the revised target of 1,350,000.
- Sixty-eight percent of the population expressed satisfaction with the improved solid waste collection services at project closure, according to the third service level and customer satisfaction survey. This was slightly short of the revised target of 70 percent.
- Approximately 70 percent of the population were paying for waste collection services per the revised target at project closure in 2018, versus 37 percent in 2008. This was short of the original target of 80 percent. Based on the data that could be obtained during the Independent Evaluation Group assessment, the waste fee collection rate in Greater Baku was estimated at approximately 65–70 percent in 2018, and Baku City's collection rate was 45 percent. Although the

project specifically targeted increasing the collection rate through a new a billing and payment collection plan, as described in the results framework at appraisal, its activities were limited to only the analytical work and data collection related to billing and payment for solid waste services. The increase in a bill collection ratio cannot be attributed to the project activities.

Overall, the increase in collection of generated waste recorded significant progress, from 51 percent in 2010 to 82 percent in 2020 in Greater Baku.

The PDO 2 efficacy rating is **substantial**, with moderate shortcomings.

Objective 3: To Enhance Waste Data Information and Financial Management Capacity in the Greater Baku Area

Theory of change. Capacity building of the newly created Tamiz Shahar JSC in Greater Baku included development of data and financial systems for waste management to enhance waste data information and financial management capacity.

Outputs

- The central waste data information system was installed, as targeted.
- The project installed four weighbridges at the Balakhani landfill for collecting information on waste data (the weighbridges calculated the weight of the truck and waste entering and exiting each facility to estimate the flow of waste, which was documented along with the truck information and the fees collected for dumping). Data are also recorded from the materials recovery facility, the waste-to-energy plant, and the eco-industrial park (companies using recyclables from the materials recovery facility).

Outcomes

Six facilities were providing regular information to the waste data information system at project closure, as targeted. Significant progress has been made with the provision of reliable information related to the treatment and disposal waste quantities in Greater Baku (waste volumes, waste composition, and financial data). The waste information system operated by Tamiz Shahar JSC is compiling data from multiple entry points and sources to ensure performance monitoring.

The data on solid waste treatment and disposal management are well developed and monitored. Although there are still significant data gaps on the MSW collection rate and collection coverage of the Greater Baku area, this is beyond the scope of responsibilities of Tamiz Shahar JSC. As evidenced by the Report on Implementation of the Action Plan to improve SWM in Azerbaijan (2021), the waste management system developed under

the World Bank project and managed by Tamiz Shahar JSC is planned to be replicated at the national level.

The PDO 3 efficacy rating is **high**.

Overall Efficacy

The project achieved the objectives of improving solid waste disposal and increasing in collection coverage in a substantial way, with some moderate shortcomings. The achievement of the objective of enhancing data and financial management capacity in Greater Baku is assessed as high.

The overall efficacy is rated **substantial**.

3. Efficiency

Economic Analysis

There was no economic analysis at appraisal or for the additional financing project. Economic benefits were assumed from the improved sanitary and environmental conditions for the population, lowering the incidence of disease and increasing property values over the long term, but these were not estimated. The additional financing restructuring paper (2013) specifies that the additional activities would contribute to generating economic benefits from supporting a fully integrated waste management center for sorting, recycling, energy recovery, and final disposal of waste. The central location of the Balakhani disposal site in Greater Baku was considered a significant economic benefit to the collection and transportation of waste. Furthermore, the additional financing would reduce the negative environmental impacts related to the need for additional landfill sites in the Greater Baku area. Expansion of landfill capacity at the Balakhani site was selected as the least-cost option because the cost and pressure on available land had increased substantially.

An economic analysis was conducted at closure for the following activities: (i) Balakhani for the Greater Baku area, with a size of 43 hectares; (ii) two large sites—Shuvalan and Garadakh—ranging from 0.6–1 hectare; (iii) five medium sites of approximately 0.04 hectares; and (iv) 32 small sites. The quantitative benefits were to come from improved land value of the surrounding areas, avoided greenhouse gas emissions resulting from more efficient waste management operations, and avoided leachate pollution of the improved Balakhani site and the capped sites. Using a 6 percent social discount rate over 20 years, the net present value of the project was \$85 million, and the economic internal rate of return was estimated at 20 percent.

Financial Analysis

No financial analysis was conducted at appraisal or closure. At appraisal, the sector was characterized by vastly insufficient tariffs, low collection rates, high arrears, and undefined subsidies. Because of wide gaps in basic data, the estimates for total revenue before subsidies were very rough. The ICR did not attempt to conduct a financial analysis of Tamiz Shahar JSC. It acknowledged that its services are subsidized.

Administrative and operational issues. The project experienced delays in the initial phase, with an effectiveness delay of more than a year after World Bank approval. Additional civil works associated with the upgrade of the Balakhani site led to the extension of the closing date for the original project. There were delays for the activities associated with additional financing related to permit delays for the Balakhani landfill works and the finalization of analytical studies.

Efficiency is rated **substantial** to acknowledge the satisfactory ex post economic rate of return, though the delays were significant, considering the total implementation period of 10 years.

4. Outcome

The objectives were substantially relevant to the government and the World Bank strategies. Efficacy of the three original objectives—to increase solid waste coverage, improve solid waste disposal management, and enhance waste data information and financial management capacity in the Greater Baku area—is rated **substantial**. Efficiency is rated **substantial**, considering the project’s economic viability at closure, though there were delays in completion. The overall outcome is rated **satisfactory**.

5. Risk to Development Outcome

Environmental risk. Informal waste dumping, mainly in remote parts of Greater Baku, poses environmental risks. The government has not yet proceeded to build two transfer stations as part of its National SWM Strategy. An estimated 50 percent of the collected waste is dumped informally and fails to reach the authorized treatment and disposal facilities. These unsustainable practices generate contamination of water, soil, and air and pose health risks to residents, including waste pickers on open dump sites.

Financial risk. Tamiz Shahar JSC depends on government subsidies, which poses financial risks. The issues associated with financial sustainability are yet to be addressed through the implementation of the National SWM Strategy, adopted by a presidential decree that mandates tariff increases in a phased approach. The decree also mandates

inclusion of the SWM tariff in the utility bill (instead of it being collected separately) to ensure that the collected resources are channeled back into the waste sector.

6. Bank Performance

Quality at Entry

This project was prepared based on the experience of previous World Bank–financed projects in the country and the region (Azerbaijan Urgent Environmental Investment Project and the Tashkent Solid Waste Management Project). Lessons incorporated at design included complementing capacity-building activities with investments, sequencing of activities with capacity-building activities for MSW management preceding investments, and linking service improvements on SWM to higher payment rates for financial sustainability (World Bank 2008, paragraph 20).

Risks were identified correctly at appraisal, including a financial sustainability risk. The team explicitly recognized a risk that the government would not be able to improve payments in line with the improvements in service delivery, meaning the sector would remain unsustainable. The project was structured “so as to combine improvements in collection coverage with better billing systems, more enforcement, and sustainable tariffs,” as described to mitigate the risk of a lack of financial sustainability. However, no specific activities were designed to support the financial sustainability, besides compiling the relevant sector data and building analytics. The risk materialized, undermining the project’s development outcomes, despite a sustained dialogue with the government on the need for sector financial reform.

The implementation arrangements were appropriate—the Project Management Unit was located within the Ministry of Economy, the agency for implementing the project. The arrangements made at appraisal for monitoring and evaluation (M&E) and safeguards and fiduciary compliance were appropriate.

Quality at entry is rated **satisfactory**.

Quality of Supervision

Supervision missions were held twice a year, and 20 Implementation Status and Results Reports were filed over a 10-year project implementation period (World Bank 2019). The project had four task team leaders over the 10-year project implementation period but, as the ICR describes, the continuity was well maintained (World Bank 2019). The team also brought additional resources and sector experience for a broader policy dialogue. For instance, the team secured grant funding from the Public-Private Infrastructure Advisory Facility to support analysis and policy recommendations for options of

increased private sector participation. The team's support aided in fiduciary and safeguards compliance.

With the additional financing, the team could have raised the ambition and defined new outcome targets for the sector's institutional and policy reform, dependent on the availability of data. The policy dialogue on the financial viability and a broader sector reform sustained over a decade has not yet yielded results. However, the project did establish a critical platform to serve for decision-making and as a key tool for policy action. The slow progress of the government on sector reforms also was affected by external factors, including the global COVID-19 pandemic in 2020–21.

Supervision is rated **satisfactory**.

The overall Bank performance rating is **satisfactory**.

7. Quality of Monitoring and Evaluation

Design

The five original outcome indicators were appropriate for monitoring performance, considering the wide gap in the sector data. The project envisioned substantial support for collecting data in the sector and developing the waste data systems. As reported, the information available at appraisal was largely qualitative. Baselines set at appraisal subsequently proved to be largely inaccurate (for example, number of households paying for waste collection).

The results framework was revised at the time of additional financing in 2013 to modify the PDO for clarity but without revising the outcome indicators in substance. The World Bank core sector indicators (hectares of contaminated land managed, or dump sites closed) and additional disposal capacity (tons) were added. Baselines and targets were revisited to reflect more accurate data available from the analytical studies, but the measurement of targets changed from a share (percentage) to absolute numbers.

The revised M&E design had shortcomings. The indicators pertaining to closing informal dump sites and creating landfill capacity were not sufficient to measure the improvement of the solid waste disposal management. No indicators were added at the outcome level to capture the sector institutional and policy reform supported under the project, with a quarter of project financing allocated for institutional strengthening (\$18 million). The indicator pertaining to the increased number of households paying for waste collection was appropriate because it was defined at appraisal to be achieved through rollout of a new billing and payment collection program at appraisal. However,

no activities were carried out in this regard, and the indicator was not dropped. The reported outcome could not be attributed to the project support.

The Project Management Unit was responsible for monitoring project performance, with assistance from the Ministry of Economy.

Implementation

As reported in the ICR, M&E was well implemented, with regular data collection throughout the project life. The project management team collected data and tracked progress effectively.

Use

The M&E indicators were used for monitoring project progress and as inputs for designing the National SWM Strategy. The waste information systems are being used for the daily operations of the entire treatment and disposal system operated by Tamiz Shahar JSC.

The M&E quality is rated **modest**, based on the deficiencies in the M&E design.

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World Bank. 2008. "Azerbaijan—Absheron Rehabilitation Program, ARP II: Integrated Solid Waste Management Project." Project Appraisal Document 42555-AZ, World Bank, Washington, DC.

World Bank. 2014. "Azerbaijan—Absheron Rehabilitation Program-ARP II: Integrated Solid Waste Management Project." Project Additional Financing Legal Agreement 83740-AZ, World Bank, Washington, DC.

World Bank. 2019a. "Azerbaijan—ARP II: Integrated Solid Waste Management Project." Implementation Completion and Results Report ICR00004491, World Bank, Washington, DC.

World Bank. 2019b. "Azerbaijan—ARP II: Integrated Solid Waste Management Project." Independent Evaluation Group, Implementation Completion and Results Report Review ICRR0021613, World Bank, Washington, DC.

Appendix B. Fiduciary, Environmental, and Social Aspects

Financial Management

Financial management. An assessment was conducted at appraisal of the implementing agency's capacity to address financial management issues (World Bank 2008, paragraph 46). The financial management risk was rated as substantial at appraisal, considering the implementing agency's limited experience in executing World Bank-funded projects. Mitigation measures were incorporated at design, such as hiring an external consultant with experience on World Bank-funded projects (World Bank 2008, 45). The Independent Evaluation Group (IEG) mission confirmed that the financial management was satisfactory during implementation. The annual project audits were submitted in a timely fashion during implementation and were unqualified.

Procurement

An assessment was conducted at appraisal to judge the implementing agency's ability for procurement management. Given that the agency had no previous experience with World Bank-funded projects, the Project Management Unit was to recruit a procurement specialist with experience in World Bank-funded projects (World Bank 2008, paragraph 47). The IEG mission confirmed that the procurement management was satisfactory during implementation.

Environmental and Social Safeguards

The project was classified as a category B project for environmental purposes. Besides Environmental Assessment (OP/BP 4.01), Involuntary Resettlement (OP/BP 4.12) was triggered.

Environmental assessment. The project expected negative environmental impacts of rehabilitation works, such as traffic and noise generated by vehicles; temporary pollution of air, soil, and ground and surface water; and potential disturbance of fauna and flora ecosystems (World Bank 2008, paragraph 56). An environmental impact assessment was conducted at appraisal, and an environmental management plan was prepared and disclosed publicly (World Bank 2008, paragraph 57). The IEG mission confirmed that there were no adverse environmental issues during implementation and that there was compliance with environmental safeguards.

Involuntary resettlement. World Bank (2008, paragraph 49) reported that six internally displaced person families (families supporting themselves by collecting waste for resale)

lived at the Balakhani landfill in small, self-built structures. A social impact assessment was conducted at appraisal to explore project impacts on the resident and nonresident waste pickers who lived nearby and came to the landfill to pick waste (World Bank 2008, paragraph 49). A Resettlement Policy Framework was prepared at appraisal, and a resettlement action plan was to be prepared for implementing activities associated with income restoration of waste pickers (World Bank 2008, paragraph 51). The Implementation Completion and Results Report notes that there were 144 project-affected people, according to a survey in 2011 (including six families living by the site). Those living by the site were offered apartments in Baku, and those with affected livelihoods were offered employment. The Implementation Completion and Results Report states that the project was in full compliance with OP 4.12 and the resettlement action plan. This was confirmed during the IEG mission (World Bank 2019, 22).

References

- World Bank. 2008. "Azerbaijan—Absheron Rehabilitation Program, ARP II: Integrated Solid Waste Management Project." Project Appraisal Document 42555-AZ, World Bank, Washington, DC.
- World Bank. 2019. "Azerbaijan—ARP II: Integrated Solid Waste Management Project." Implementation Completion and Results Report ICR00004491, World Bank, Washington, DC.

Appendix C. Methods and Evidence

This report is a Project Performance Assessment Report (PPAR). This instrument and its methodology are described at <https://ieg.worldbankgroup.org/methodology/PPAR>.

The Independent Evaluation Group (IEG) assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the World Bank's self-evaluation process and to verify that the World Bank's work is producing the expected results; and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn.

This PPAR evaluates the development effectiveness of the Absheron Rehabilitation Program II: Integrated Solid Waste Management Project in Azerbaijan (P110679). Given the World Bank's extensive involvement in the country's municipal solid waste sector over a 10-year period, the project was selected for a PPAR for the potential for learning from this experience for other upper- and middle-income countries with similar environmental legacy issues and weak financial sustainability. Azerbaijan is also a case study under the IEG global evaluation of the World Bank Group's contribution to the municipal solid waste management for 2010–20.

The main evaluation questions are as follows: (i) How effective the World Bank was in increasing collection coverage and improving solid waste disposal management in Greater Baku, Azerbaijan, and supporting institutional reform and capacity building in the sector? (ii) What worked and what did not work in project design and implementation? and (iii) What lessons can be drawn from this project experience? The PPAR emphasizes the report's learning function rather than project ratings. However, accountability elements are retained: project ratings and their justification are still present in appendix A, and these ratings are still based on the IEG Operations Policy and Country Services harmonized project evaluation guidelines, based on the assessment against project objectives.

This project assessment relies on a mixed methods approach that includes literature review, project documentation, sector technical background papers and feasibility analyses, and a country mission conducted from January 25 to February 5, 2021, involving semistructured interviews with different stakeholders and beneficiaries (see appendix F, List of People Interviewed). IEG would normally conduct a field mission, but given the coronavirus pandemic-related travel restrictions, it conducted a virtual mission instead, with meetings held through videoconferencing or by phone. Site visits by local consultants were not feasible because of coronavirus concerns. The interview questions were semistructured and some were open-ended to obtain a broader view of the participants.

Appendix D. Municipal Solid Waste Dimensions in Azerbaijan

Azerbaijan had a population of 10.7 million in 2020, with 53 percent urban population. Approximately 49 percent of the population is male, and 51 percent is female (AZSTAT 2019). Average population density is 116 persons per square kilometer in the country, and it is 1,072 persons per square kilometer in Baku. The average population growth rate over the past 30 years was 1.16 percent (AZSTAT 2020). Azerbaijan has a land area of 86,600 square kilometers; 47,404 square kilometers are agricultural lands, and 39,196 square kilometers are nonagricultural lands with high mountains and low-lying arid territory.

The country is divided into 10 economic regions and 5 Natural Economic Regions, including Nakhchivan Autonomous Republic. The Baku metropolitan area is included in the Absheron Economic Region, which is one of the 10 economic zones. Each economic region contains several districts (rayons). Azerbaijan has 59 rayons, 10 cities (Baku, Ganja, Sumgait, Lankaran, Shirvan, Mingechevir, Naftalan, Sheki, Khankendi, and Yevlakh), and 1 autonomous republic (Nakhchivan). Nakhchivan Autonomous Republic has also 7 rayons and 1 city (Nakhchivan city).

Municipal Solid Waste Composition and Character

Municipal solid waste (MSW) composition in the Baku area and outside the Baku area is consolidated in table D.1.

Table D.1. Consolidated Waste Composition for All Azerbaijan, 2020

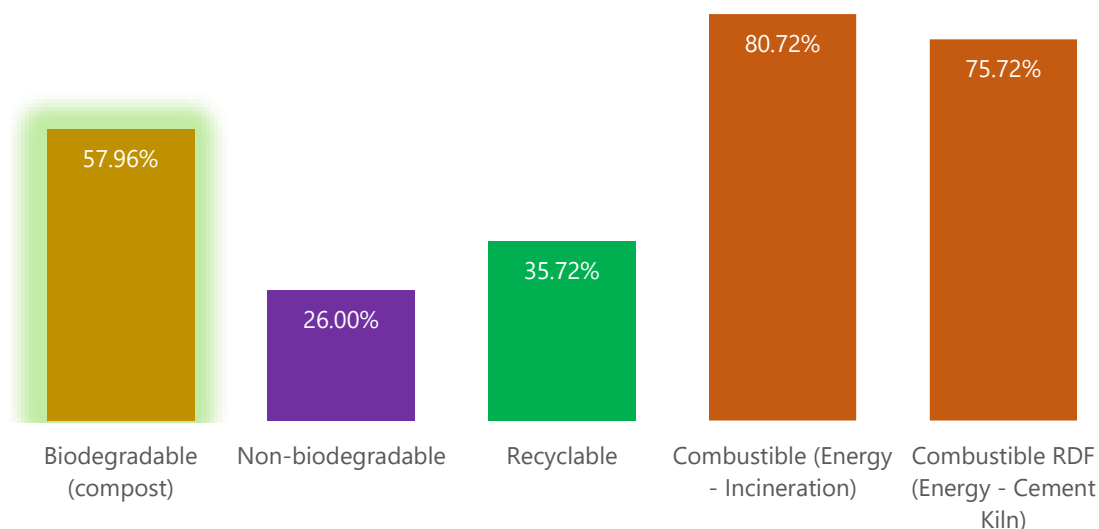
Waste	Proportion (percent)	Generated (tons, millions)	Collected (tons, millions)
Organic (food)	43.45	1.69	1.11
Cardboard and paper	14.52	0.56	0.37
Plastics	9.14	0.36	0.23
Glass	5.84	0.23	0.15
Metals	2.50	0.10	0.06
Textile	3.74	0.15	0.10
Baby diapers	4.89	0.19	0.12
Household hazardous waste	1.53	0.06	0.04
Other	14.42	0.56	0.37
Total	100.00	3.89	2.55

Source: Aim Texas Trading LLC 2021.

Overall, MSW composition shows a significant difference, according to a local government category and population size per categories and urban and rural characteristics.

The recovery potential of MSW generated in the country is depicted in figure D.2. The proportion of biodegradable MSW generated in the country is 57.96 percent, and 26.00 percent is nonbiodegradable. The percentage of recyclable MSW is 35.72 percent; 80.72 percent is suitable for combustion in incinerators for energy recovery (electricity or steam production for hot water or any industrial or domestic use), and 75.72 percent is suitable for combustion in cement kilns as refuse-derived fuel, replacing fossil fuels (oil, coal, and so on).

Figure D.1. MSW Recovery Potential for Azerbaijan



Source: Aim Texas Trading LLC 2021.

Note: MSW = municipal solid waste; RDF = refuse-derived fuel.

The consolidation of three laboratory analyses conducted in the winter, summer, and fall of 2011 showed the results presented in table D.2 on the moisture content and low and high calorific value of waste generated in Baku.

Table D.2. Moisture Content, High and Low Calorific Value, and Organic Content of Waste, Greater Baku

Parameter	Winter	Summer	Fall	Average
Humidity (percent)	52.56	41	29.25	40.9
Lower calorific value (kJ/kg)	4,078	7,414	15,548	9,013
High calorific value (kJ/kg)	12,830	14,209	22,256	16,432

Parameter	Winter	Summer	Fall	Average
Organic content (percent)	55.56	63.5	78.58	65.88

Source: Aim Texas Trading LLC, from Waste Characterization Survey Report 2011

Note: kJ/kg = kilojoules per kilogram.

MSW Generation

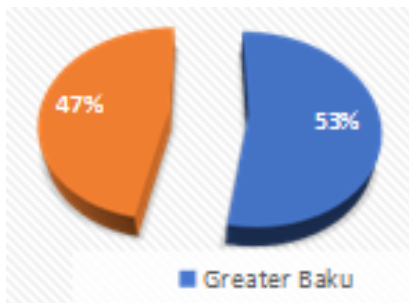
Countrywide MSW generation is estimated at 3.89 million tons in 2020, 53 percent of which is generated in the Greater Baku area and 47 percent outside the Baku area, including Ganja, Sumgait, Khirdalan, and Mingechevir cities (table D.3; figure D.3).

Table D.3. Waste Generation in Azerbaijan, 2020

	Waste Generation	
	(tonnes per year)	(percent)
Azerbaijan	3,889,930	100
Greater Baku	2,063,790	53
Outside Greater Baku	1,826,140	47

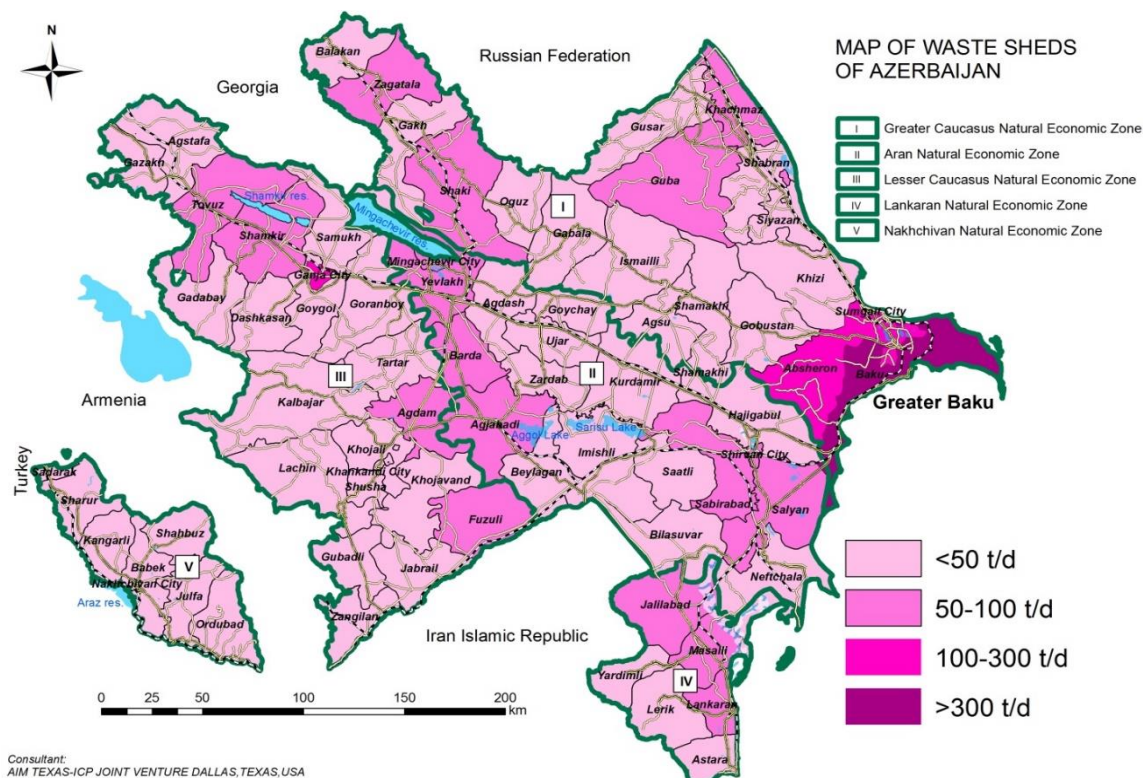
Source: Aim Texas Consultants' estimation based on data and information from different sources.

Figure D.2. Waste Generation in Azerbaijan, 2020



Source: Aim Texas Trading LLC 2021.

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



Source: Aim Texas Trading LLC, from Concept Paper for ISWMS of Azerbaijan 2015.

Note: The figures on total waste generation in Azerbaijan are compiled from different data sources because no detailed waste generation data are published by Azerbaijan Statistical Committee for municipal solid waste generation. t/d = tonnes per day.

Table D.4. Waste Generation by Local Government Units

Local Government Category	Population Range for Category	Share of Country Population (percent)	Population by 2020 (thousands)	Waste Generation	
				(t/y, thousands)	(percent)
Metropolitan-Greater Baku–100 percent urban	>1,000,000	22.78	2,293	2,059	53
Cities (cities)–100 percent urban	100,000–500,000	9.56	963	446	11
Large Urban (rayon center cities)	50,000–100,000	8.09	814	309	8
Medium urban (rayon center cities)	5,000–50,000	12.34	1,242	345	9
Rural (small towns, settlements, and villages)	500–5,000	47.23	4,755	728	19
Total		100	10,067	3,887	100

Source: Aim Texas Trading LLC's estimates 2021.

Note: t/y = tonnes per year.

Municipal Solid Waste Collection

An estimated 2.654 million tons of MSW was collected in 2019 in Azerbaijan, 64 percent of which was collected in the Greater Baku area and 36 percent outside the Baku area. Although the overall MSW collection efficiency rate in Azerbaijan is 68 percent, the rate in the Greater Baku area is 82 percent; the rate is 52 percent for outside the Baku area (table D.5).

Table D.5. Waste Collection throughout Azerbaijan, 2019 Estimates

	Generation (t/y, millions)	Collection (t/y, millions)	Collection	
			(percent)	Efficiency (percent)
Total Azerbaijan	3.89	2.65	100	68
Greater Baku	2.06	1.70	64	82
Azerbaijan excluding Greater Baku	1.83	0.95	36	52

Source: Aim Texas Trading LLC's estimates 2021.

Note: Collection efficiency refers to collection rates in urban areas because waste collection service is almost nonexistent for 47.23 percent of the population in rural Azerbaijan. t/y = tonnes per year.

Mainly, curbside collection is applied for the MSW collection in Azerbaijan. Separation at the source is not a common practice in the country, even though some efforts are observed in Greater Baku and the cities of Ganja, Sumgait, and Khirdalan. Two or three bins are used in and along the main roads and central business districts of those cities, including the shopping malls and international airports in Baku and Ganja.

MSW Disposal and Treatment

In Azerbaijan, 61 percent of waste collected in the country is still being dumped in open dump sites legally and illegally, and 5 percent is landfilled in the Balakhani sanitary landfill. An estimated 18 percent is recycled formally and informally, and 17 percent is incinerated for energy recovery in the Baku waste-to-energy (WtE) plant.

The Balakhani sanitary landfill, the material recovery facility (MRF), the WtE plant, and the eco-industrial park constitute the Waste Hub Area in the Greater Baku area (see figure D.4).

Figure D.3. Waste Disposal and Treatment Facilities in Baku (Balakhani Waste Hub)



Source: Aim Texas Trading LLC 2021.

Greater Baku

Balakhani Sanitary Landfill

The Balakhani landfill in Baku is the only sanitary landfill in the country.

Before 2011, Greater Baku had three active dump sites, which were Balakhani, Garadagh, and Shuvelan. The Garadagh and Shuvelan dump sites were closed in 2013. The Balakhani dump site was upgraded into an engineered sanitary landfill in 2012 to meet the entire Greater Baku requirement for disposal. The Balakhani landfill was designed to provide residual waste disposal capacity of approximately 12.17 million cubic meters by 2032. The landfill has 120 hectares of land near Buyukshor Lake in the Balakhani district of Sabunchu Rayon in Greater Baku area. It is the single destination for all the districts of Greater Baku (12 rayons). The Balakhani landfill is operated by state-owned Tamiz Shahar JSC of Azerbaijan since 2012.

Baku Materials Recovery Facility

The MRF was commissioned in December 2012 and has a design capacity of 200,000 tonnes per year. The facility was built to increase waste recovery, thereby reducing the amount of waste landfilled, and to encourage the development of the recycling sector.

The MRF sorted 0.389 million tons of MSW from 2013 to 2017, but no data exist on the share of recyclable materials sorted in the plant that is sold to waste processors and the share of sorted recyclables that is transferred to the WtE plant for incineration. The

following analysis shows the facility's operational efficiency in 2013–17, with the average efficiency of 39 percent (table D.6).

Table D.6. Operational Efficiency of Material Recovery Facility in Baku, 2013–17

	2013	2014	2015	2016	2017
Sorted recyclables (t/y)	67,604	85,061	80,890	84,497	70,876
Operational efficiency (percent)	34	43	40	42	35

Source: Tamiz Shahr JSC.

Note: t/y = tonnes per year.

Baku Waste-to-Energy Plant

The WtE plant was commissioned in December 2012, with a design capacity of 500,000 tonnes per year of MSW. This facility was developed under a 20-year design-build-operate contract between the government of Azerbaijan (represented by the Ministry of Economy) and the French company Constructions Industrielles de la Méditerranée. It consists of two process lines using advanced, fourth-generation technology and a turbine generating electrical energy. Although the facility was designed to process up to 10,000 tonnes per year of health care waste, no health care waste has been accepted yet. Health care waste is handled separately by the medical institutions under the control of the Ministry of Health. Each medical institution in Azerbaijan has a system and equipment for handling hazardous medical waste at its own facility since 2012. The Baku WtE plant incinerated 3.22 million tons of MSW from 2013 to 2019, generating 1.35 million megawatts of electricity, 85 percent of which is sold to Azerenergy at a rate of 0.04 Azerbaijan manat (about \$0.024) and generating income of about \$38.18 million in 2013–19.

The design capacity of the WtE plant is 231,500 megawatt hours of electricity generation per year, which means that operational efficiency is designed as 0.463 kilowatt-hours per kilogram, indicating an approximate “bathtub curve” pattern (ranging from 0.287 to 0.568 kilowatt-hours per kilogram). However, the analysis in table D.7 shows that the average operational efficiency from 2013 to 2019 did not reach the design values, even in 2018 and 2019, when the feedstock was provided fully, according to the plant's design capacity.

Table D.7. Operational Efficiency of the WtE Plant in Baku, 2013–19

	2013	2014	2015	2016	2017	2018	2019	Total
Incinerated waste (t/y)	339,850	437,994	506,139	476,139	450,756	501,306	512,492	3,224,676
Electricity produced (megawatts)	134,080	173,742	181,850	174,490	170,330	136,036	164,396	1,134,924
Operational efficiency (kWh/kg)	0.395	0.397	0.359	0.366	0.378	0.271	0.321	0.355
Income generated (Azerbaijan manat, millions)	4.56	5.91	6.01	5.83	5.66	4.63	5.59	38.18

Sources: Tamiz Shahar JSC; ADB 2020; Aim Texas Trading LLC's analysis.

Note: kWh/kg = kilowatt-hours per kilogram; t/y = tonnes per year; WtE = waste-to-energy.

Balakhani Eco-industrial Park

The Balakhani Industrial Eco-Park is a bold concept aimed at improving the economic performance of participating companies while minimizing their environmental impacts (photo D.1). The park is established on an area of 70,000 square meters adjacent to the WtE and MRF. It is reported that 19 recycling processors are currently active in the eco-industrial park working on green products manufacturing, that is, plastic recycling, tire and rubber recycling, nonferrous metal and cabling recycling, waste from electrical and electronic equipment and household hazardous waste recycling, and lead acid batteries recycling.

Photo D.1. MSW Disposal and Treatment Facilities in Baku

a. Balakhani landfill entrance

b. Baku waste-to-energy plant

c. One of the recyclers in Eco-Industrial Park



Source: Aim Texas Trading LLC 2021.

Note: MSW = municipal solid waste.

MSW Used in the Balakhani Waste Hub Area

MSW accepted and used in waste treatment facilities in the Balakhani Waste Hub in 2013–19 is shown in table D.8.

Table D.8. MSW Used in Balakhani Waste Disposal and Treatment Facilities (tons)

Data Year	Collected	Received	Sorted	Used in Baku WtE	Scrap Metal Recovered by WtE	MSW Landfilled ^a
2013	1,117,010	568,336	67,604	339,850	3,430	219,000
2014	1,128,180	676,767	85,061	437,994	2,441	235,000
2015	1,139,461	751,940	80,890	506,139	3,840	147,000
2016	1,150,856	629,982	84,497	476,139	6,768	157,000
2017	1,162,365	642,993	70,876	450,756	3,317	170,000
2018	1,173,988	650,000	80,000	501,306	6,201	170,000
2019	1,185,728	700,000	80,000	512,492	5,441	175,000

Sources:

- Data from Tamiz Shahar 2018.
- Data from Asian Development Bank case study (ADB 2020).
- Data from Collection Program Design Report for Greater Baku, Aim Texas 2013 (consultant's projection, including area cleaning waste).
- Aim Texas Consultant's estimation.
- Aim Texas Consultant's calculation.

Note: MSW = municipal solid waste; WtE = waste-to-energy.

a. Including treated and landfilled incineration bottom ash and fly ash generated by the Baku WtE.

Recycling

Informal diversion of recyclable fractions during the collection cycle is common. Recycling of plastic, metal, and paper scraps is implemented largely by the informal recycling sector for producing secondary materials from scrap plastics, such as new polyethylene terephthalate bottles and caps in the bottled water and soft-drink industry, plastics in HP and high-density polyethylene water pipe production, and scrap metals in rebar (construction steel) production. There are no statistics on production from secondary materials. Plastic recycling is processed mostly for plastic bottles and film in the production of plastic bottles, caps, film products, and bags in the country.

Metal scraps collected by waste scrap dealers and waste pickers are mainly processed by a large steel industry in Baku and Sumgait for the production of steel rebar, profiles, and I-beams, among other things, for the construction industry and light industries. Scrap paper supply is processed mainly by a large-scale secondary pulp producer and a few small scrap dealers in Sumgait and Balakhani and is processed in the production of packages, paper napkins and towels, and toilet paper, largely.

Currently, the Azerbaijan recycling industry provides employment for more than 6,000 people in Azerbaijan.

References

- ADB (Asian Development Bank). 2020. *Waste to Energy in the Age of the Circular Economy: Best Practice Handbook*. Manila: Asian Development Bank.
- Aim Texas Trading LLC. 2021. *Municipal Solid Waste Management in Azerbaijan*. Background Technical Paper. Baku, Azerbaijan: Aim Texas Trading LLC.
- AZSTAT (Azerbaijan State Statistical Committee). 2019.
- AZSTAT (Azerbaijan State Statistical Committee). 2020.

Appendix E. MSW Regulatory and Institutional Framework in Azerbaijan

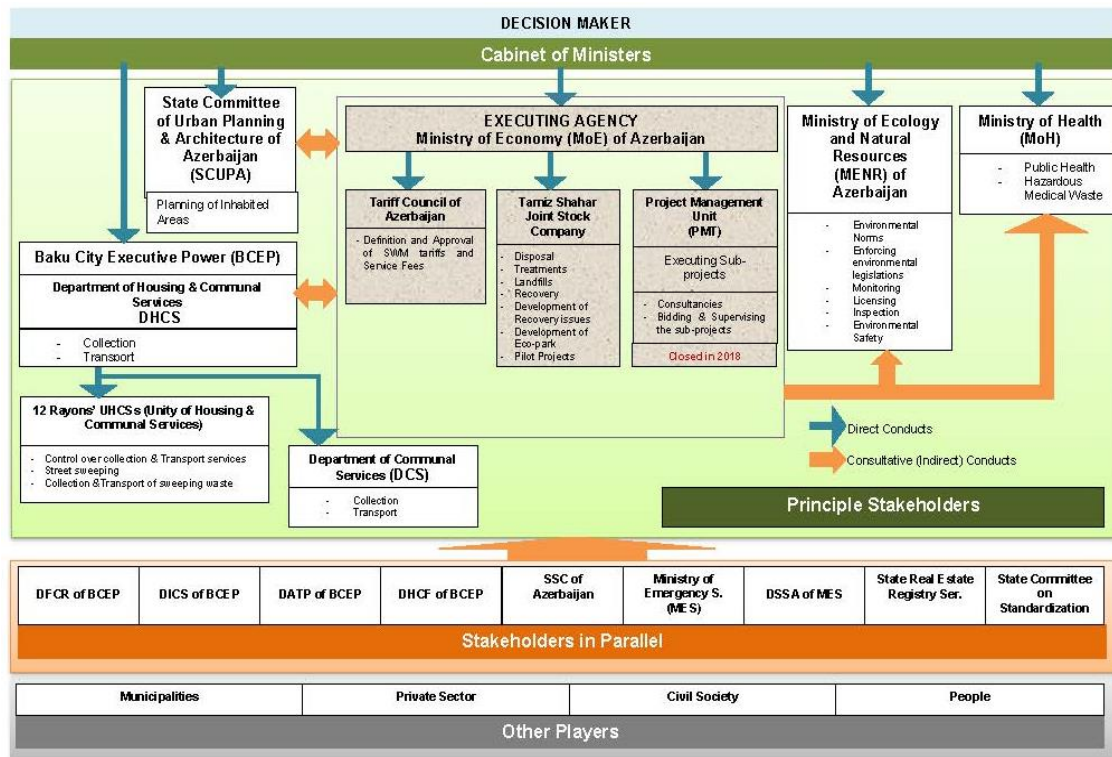
Municipal Solid Waste Institutional Framework

Azerbaijan is divided into 59 districts (rayons), 11 cities, 2,732 municipalities, and the autonomous Republic Nakhchivan, comprising 7 rayons and 1 city. The regional executive powers govern the rayons and cities. The president appoints the heads of the regional executive powers. Municipalities were created by law in 1999 and started to operate in 2000 with elected mayors and city councils. The actual transfer of responsibilities and financing has been lagging, however. The municipalities do not yet have adequate authorization under the Law on Industrial and Domestic Wastes or the capacity to participate significantly in the solid waste sector.

The institutional framework is fragmented, and a central coordinating body is envisioned but not yet created. The Ministry of Economy has emerged as the leading ministry for solid waste management (SWM) policy formulation, strategic planning, and legislation. The Ministry of Economy is a primary coordinating authority for the actions to be taken under the National SWM Strategy in the Republic of Azerbaijan for 2018–22. By its internal orders, it regularly controls the coordination of these actions, reporting and communication on actions taken in this area.

In Greater Baku, the institutional framework has been changed since the establishment of Tamiz Shahr joint stock company (JSC), a state-owned agency responsible for municipal solid waste (MSW) disposal and treatment in the city since 2009. At the same time, the responsibility of municipalities to undertake MSW services of collection, transport, and transfer remained unchanged in Greater Baku. MSW collection, transport, and transfer services are executed by the Department of Housing and Communal Services (DHCS) of 12 Baku rayons' regional executive powers and the DHCS of Greater Baku Executive Power (EP), and 16 municipalities (see figure E.1).

Figure E.1. MSW Management Responsibilities and Key Players in Greater Baku



Source: Aim Texas Trading LLC 2021.

Note: MSW = municipal solid waste; SWM = solid waste management.

Role of the Organizations Directly Involved in MSW Management in Greater Baku

Ministry of Economy of Azerbaijan

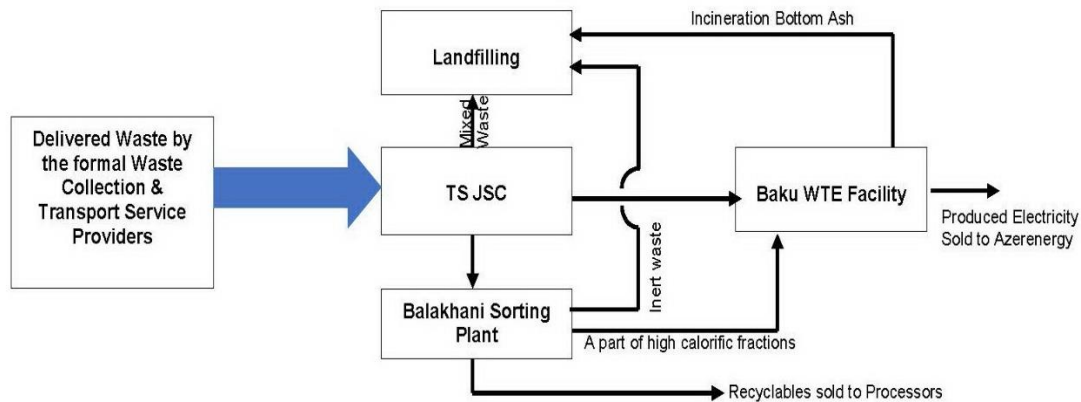
The Ministry of Economy has the authority to conduct the overall coordination of Tamiz Shahr JSC's activities and to assign its chair and members of the supervisory board.

Tamiz Shahr JSC

Tamiz Shahr JSC is a government-owned SWM company. It was established under the presidential order "On Improvement of Municipal Waste Management in Baku City," signed on August 8, 2008. It is responsible for carrying out works related to placement and disposal and treatment of all MSW generated in the metropolitan area of Baku.

Figure E.2 shows Tamiz Shahr JSC's operation functions and the waste flow in the Balakhani Waste Hub.

Figure E.2. Waste Flow in Balakhani Waste Hub



Source: Aim Texas Trading LLC 2018

Note: TS JSC = Tamiz Shahar joint stock company; WTE = waste-to-energy.

Baku City Executive Power

Baku City EP is the senior executive authority within the territorial boundaries of Greater Baku City's administrative area. The head of the EP is assigned by special presidential decree and reports directly to the president and the Cabinet of Ministers. Baku City EP has broad authority in managing different areas of activities in the Greater Baku area, including ensuring the implementation of state environmental protection and waste management policies. The rights and responsibilities of the EP in SWM are regulated according to the Regulation on Regional and City Executive Powers. Baku City EP is implementing its waste management responsibilities through the DHCS.

Key responsibilities of EP include the following:

- Establishment and operation of the rational domestic waste collection, storage, and removal system at places
- Calculation of solid and liquid municipal waste generation averages
- Development of the list of territories to be cleaned by different profile organizations
- Development of the schedule for mechanical cleaning and seasonal washing of streets, squares, and passages
- Collection of waste at residential areas
- Coordination of activities of the local waste management services
- Control over the sanitary situation

- Development and approval of sanitary primary plans
- Allocation of land for construction of landfills and other disposal and storage facilities for industrial and domestic waste
- Approval of local domestic waste management regulations for the use of communal services
- Licensing of entrepreneurs engaged in domestic waste management activities

DHCS of Baku City EP

DHCS was established based on Order 444 dated May 12, 1999, issued by the head of Baku City Executive Authority, and entitled on actions of improvement of the management system of Baku City's housing. The department was established as the sole management body dealing with the city's housing under the head of the Baku City EP.

The DHCS of Baku City EP currently provides the solid waste collection and transport services for almost 65 percent of the Greater Baku area. Responsibilities of the DHCS of Baku City EP include the following:

- Collection and transportation of waste from residential buildings, offices, squares, streets, gardens, and other areas of settlements
- Development, amendment, and control over the fulfilment of the schedule for transportation of collected waste by special vehicles
- Ensuring complete collection and transportation of waste to the landfills
- Making sure that separately collected waste is not mixed during its transportation, treatment, and disposal
- Prevention of negative environmental and health impacts during collection and transportation of waste
- Keeping the waste registry

Housing and Communal Services of 11 Rayons of the Greater Baku Area

The responsibilities of communal services that are part of the regional and city EPs include management of cleaning the residential areas from solid domestic waste.

- Collection and transportation of waste from residential buildings, offices, squares, streets, gardens, and other areas of settlements

- Development, amendment, and control over the fulfilment of the schedule for transportation of collected waste by special vehicles
- Ensuring complete collection and transportation of waste to the landfills
- Making sure that separately collected waste is not mixed during its transportation, treatment, and disposal
- Prevention of negative environmental and health impacts during collection and transportation of waste
- Keeping the waste registry

Ministry of Ecology and Natural Resources

The Ministry of Ecology and Natural Resources has the overall responsibility for the protection of the environment, including industrial and municipal waste management.

Key responsibilities include the following:

- Control over nature management and environmental protection activities of the other government agencies
- Enforce environmental legislation
- Ensure proper fulfilment of the environmental safety requirements
- Implement scientific and technical policy regarding nature management and environmental protection
- Implement environmental monitoring and expertise
- Approve environmental quality norms
- Issue and withdraw the air emission and wastewater discharge permits and issue the industrial and domestic waste use permits
- Monitor the cleanness of streets, blocks, and other public places of towns and other residential areas and the beaches

Ministry of Health

The Ministry of Health is concerned with and is responsible for the public health aspects of municipal SWM services, according to the Law on Sanitary-Epidemiological Services of 10 November 1992. The Ministry of Health is currently responsible for the management of medical wastes in Azerbaijan.

The Ministry of Health is the second-largest government authority responsible for the regulation of waste management activities.

Key responsibilities include the following:

- Control over the implementation of sanitary rules in different parts of the residential areas (streets, squares, parks, yards, and so on), public places, and beaches
- Approval of the lists of residential areas, public buildings, streets, squares, crosswalks, parks, gardens, beaches, and so on, for the organization of regular waste removal activities
- Development and approval of rules for collection, transportation, disposal, and landfilling of the domestic and toxic industrial wastes
- Enforcement of sanctions against violators of sanitary rules
- Training sanitary inspectors
- Training specialists from local communal services

Legal and Regulatory Setting

The main legal instrument in waste management in Azerbaijan is the Law on Industrial and Household Waste (1998, amended in 2007).

The law defines municipal waste as “substances, items, and materials originating in residential areas as a result of human life.” This definition does not include waste from the commercial, institutional, and industrial sector or street waste and wastes from green areas and parks, which typically are also defined as MSW.

There is only an old ordinance (prepared in the Soviet era), applied by the Baku City EP, that defines how much waste is generated by the commercial and institutional sector. However, this ordinance is prepared for only the estimation of commercial and institutional waste amounts from small and large commercial premises and institutions (including schools—per pupil, teacher, and administrative personnel), government departments and offices (per employee), and medical institutions (hospitals—per bed and per employee).

The following are key laws and legal instruments pertaining directly to SWM. Overall, there are more than 100 laws and instruments currently in force that relate to waste management.

- The Law of the Republic of Azerbaijan (RA) on the “Protection of the Environment”(08.06.1999, No: 678-IQ)
- The Law of the RA on “Industrial and Domestic Wastes” (30.06.1998, No: 514-IQ) with further amendments
- The Law of the RA on “the Status of Municipalities” (02.08.1999, No: 698-IQ)
- The Order by the President of the RA on “Improvement of Municipal Waste Management in Baku City” (06.08.2008, No: 2983)
- The Law of the RA on “Access to Environmental Information” (12.03.2001, No: 270)
- The Instruction on “Procedures of Inventory of Wastes Generated during Industrial Processes and from Service Sectors and Classification System” (entered into the State Registry of the Ministry of Justice of the RA; IPIWCS No: 419; Registration 14.07.2003, No: 2986)
- Regulations on “the Issuance of special permits (licenses) for wastes management.”

National Solid Waste Management Strategy

On November 1, 2018, the “National Strategy on the Improving Solid Waste Management in the Republic of Azerbaijan for the Years of 2018–22” was approved by Presidential Decree No. 637. The main objectives of the National Waste Management Strategy are as follows:

- To improve core collection and disposal processes, including the development of regional landfills and transfer stations that will provide disposal services for various groupings of rayons throughout the entire of Azerbaijan, including Nakhchivan Economic Region
- To ensure the efficient use of available resources in setting up the investments and development programs that would improve solid waste collection, recovery, and disposal in all the country’s rural and urban areas

The strategy’s duration is five years, but it constitutes the first phase of a 20-year-long government strategical development program.

The strategy consists of seven chapters. Chapter 1 describes the background of SWM sector development in Azerbaijan, including milestones achieved to the day of the

strategy's acceptance, the reason why the strategy is needed, and advantages expected from the strategy implementation.

Chapter 2 provides a summary of the following objectives pursued by the strategy:

- Expansion of solid waste collection services to cover all residential and nonresidential areas of the country
- Ensuring safe and efficient disposal of all nonrecyclable and expensive-to-recycle wastes
- Increasing waste sorting, processing, and recycling capacities through public education, effective public awareness campaigns, new solid waste systems, and market initiatives
- Improvement of a potentially hazardous waste management system
- Gradual elimination of open pits that do not meet environmental requirements

Chapter 3 cites the following five priority directions of the strategy:

- Improving the quality and efficiency of waste management through the application of advanced international experience and technologies
- Strengthening the material and technical base, construction of new infrastructure facilities, and provision of modern machinery and equipment
- Organizing a SWM system in accordance with international standards (waste reduction, sorting, recycling, processing, resource recovery)
- Gradually reducing subsidies allocated from the state budget for SWM and introducing a new tariff system and collection mechanisms
- Taking appropriate measures to extract energy from solid waste using modern methods

Chapter 4 sheds light on the financial issues, identifying budgetary allocations, microcredits, international grants, and local and foreign investments as major financing sources of the waste management projects.

Chapter 5 outlines the following results expected from the strategy implementation:

- Improved waste collection, transportation, recycling, and disposal systems
- Efficient use of available resources in investing in the waste management projects in both urban and rural areas

- Establishment of regional sanitary landfills and solid waste transfer stations that would cover the entire territory of the country
- Efficient waste fee collection and optimized tariff schedules
- Gradual reduction of budgetary subsidies in the SWM sector
- Improved public health
- Reduced negative waste-related environmental impacts and ensured sustainability in the use of natural resources
- Increased employment opportunities in the sector

Chapter 6 declares the government commitment to mobilizing all efforts to the strategy implementation.

Chapter 7 includes the list of specific activities (projects) put on the strategy implementation agenda for the next five years. The list consists of 17 projects grouped into five subcategories in the following four categories:

- Institutional development (six projects)
- Development of scientific and professional capacities, public awareness (two projects)
- Improvement of waste management infrastructure (seven projects)
- State support to the waste management system (two projects)

Needs for Improvement

The following actions could help improve the regulatory framework:

- Clarify the roles of waste owners, servers, agents, and state control authorities
- Develop a regulatory framework for increasing the role of local self-governance institutions
- Develop a regulatory framework for stimulating private and third-party participation
- Set out requirements for waste characterization to make data collection and comparison more feasible
- Define and develop a minimum design for controlled and sanitary landfills

- Set out emission standards for controlled landfills, waste treatment, and recycling facilities
- Specify minimum exclusion criteria for siting facilities handling wastes and minimum setback requirements
- Set out reporting requirements for all waste management facilities
- Develop waste treatment and recycling plans for the cities and districts
- Develop a quality certification program
- Develop regulatory incentives to enable district-level landfills and other waste management facilities to receive waste from the rural areas
- Develop regulations for source aggregation of hazardous medical wastes
- Develop regulations for medical waste treatment
- Develop regulations for construction waste management
- Set up targets for recycling and resource recovery
- Harmonize regulations with European Union and other internationally accepted standards

References

- Aim Texas Trading LLC. 2018. *Waste Fee Framework for the Greater Baku Area*. Baku, Azerbaijan: Aim Texas Trading LLC.
- Aim Texas Trading LLC. 2021. *Municipal Solid Waste Management in Azerbaijan*. Background Technical Paper. Baku, Azerbaijan: Aim Texas Trading LLC.

Appendix F. List of People Interviewed

Table F.1. List of People Interviewed

Name	Organization	Position/ Title
Sarah G. Michael	World Bank Group	Country Manager
Kremena M. Ionkova	World Bank Group	Task Team Leader/Sr. Urban Development Specialist
Björn Philipp	World Bank Group	Task Team Leader/ Program Leader
Frank Van Woerden	World Bank Group	Task Team Leader/ Lead Environmental Engineer
Hadji Huseynov	World Bank Group	Sr. Infrastructure Specialist
Silpa Kaza	World Bank Group	Sr. Urban Development Specialist/ ICR Author
Ülviyyə Valiyeva	Ministry of Economy	Head of Division for Cooperation with International Financial Institutions
Umid Aghazada	Ministry of Economy	Adviser of the Cooperation with International Organizations Department
Sabit Zeyniyev	Tamiz Shahar joint stock company	Deputy Chair of the Executive Board
Sabuhi Babayev	Tamiz Shahar joint stock company	Head of the Department of Environment and Occupational Safety
Faig Sadigov	Project Management Team	SWM/Environmental Engineer
Huseyngulu Ismayilov	Project Management Team	Procurement Specialist
Emil Huseynov	Project Management Team	Financial Specialist
Sevinj Muradova	Project Management Team	Social Specialist
Mehman Nabiyeu	Environmental policy department of MENR	Head of the Risk Analysis and Assessment Section
Yashar Karimov	Foreign relations department of MENR	Head of Foreign Relations Section
Mirzakhan Mansimov	IQLIM Research and Consulting	Director
Islam Mammadov	SULACO Construction Co.	Certified solid waste management expert
Gulara Mammadova	Chevre Local NGO	Environmental Project Manager
Elkhan Yusifov	Balakhani Sorting Plant	Waste Sorter (a former waste picker before rehabilitation of the landfill)
Rahman Garabeyov	Balakhani Sorting Plant	Waste Sorter (a former waste picker before rehabilitation of the landfill)
Nigar Mammadova	The Khojasan Municipality	Mayor
Chingiz Mammadov	United Nations Development Programme	Program Adviser on energy, environment, climate change and resilience
Real Hajiyev	European Bank for Reconstruction and Development	Principal Banker

Appendix G. Borrower Comments

Unofficial translation

June 30, 2021

No. X/O-6385/2021

From the Ministry of Economy of the Republic of Azerbaijan

To Mr. Christopher Nelson, Manager of Infrastructure and Sustainable Development
Project Evaluation Unit of Independent Evaluation Group

Re: Comment on the Draft Report

Dear Mr. Nelson,

We would like to inform you that the Ministry of Economy has accordingly reviewed your letter requesting our comment on the draft Project Performance Assessment Report for ARP II Integrated Solid Waste Management Project.

Hereby, we are presenting our comment on the draft report to your attention.

Regards,

Deputy Minister Rovshan Najaf

Attachment: 1 page

Comments of the Ministry of Economy on the draft Project Performance Assessment Report for ARP II Integrated Solid Waste Management Project prepared by the Independent Evaluation Group

1. Different parts of the Report mention the closure of 132 informal dump sites under the Project. However, in reality, 41 informal dump sites were closed, moved to Balakhani landfill and cleaned up. As this information is incorrect, please revise the respective parts of the Report accordingly.
2. In regard to the paragraph 2.19 of the Report, we would like to mention that the Ministry of Economy is a primary coordinating authority for the actions to be taken under the National Strategy for Improvement of Solid Waste Management in the Republic of Azerbaijan for 2018–22. Therefore, the Ministry of Economy, by its internal orders, regularly controls the coordination of these actions, reporting and communication in regard to taken actions in this area. In this regard, it will be advisable to revise the para 2.19 of the Report accordingly.

3. In the appendix of list of people interviewed, Nizami Mammadov is reported as staff of Human Resources Department of “Temiz Sheher” OJSC. As this information is incorrect, please revise the list accordingly.