Ministry of Natural Resources, Ecology and Technical Supervision
Kyrgyz Republic

Report on Technology Plans Actions

Part II
Technology action plans for climate change mitigation (energy and waste sectors)

Supported by:

GREEN CLIMATE FUND

CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

UN environment programme | copenhagen climate centre
supported by UNOPS

Bishkek, September 2023

Technology Needs Assessment (TNA) for Mitigation. Report on Technological Action Plans for the Energy and Waste sectors

National TNA Coordinator:
Mr. Azamat Temirkulov, Director of the Climate Finance Centre under the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic.

Local technical experts
Mr. Edilbek Bogombaev, energy sector
Ms. Oksana Zabenko, waste sector

Project coordination, UNEP Copenhagen Climate Centre
Mr James Haselip
Mr. Paul Riemann

International TNA consultants:
Ms. Ala Druta, Republic of Moldova
Mr. Yuriy Matveev, Republic of Ukraine

Note
This publication is the result of a technology needs assessment project funded by the Green Climate Fund (GCF) and implemented by the United Nations Environment Program Copenhagen Climate Center (UNEP-CCC) on behalf of the Climate Technology Center and Network (CTCN). The views expressed in this publication are those of the authors and do not necessarily reflect the views of UNEP-CCC. We regret any errors or omissions that may have been made unintentionally. This publication may be reproduced in whole or in part and in any form for educational or non-commercial purposes without express permission of the copyright owner, provided the source is acknowledged.

Content

Executive Summary

This report marks the third instalment in the Technology Needs Assessment (TNA) project for mitigating climate change in the Kyrgyz Republic. It aims to delineate technological activities, identify responsible authorities, and present an action plan for prioritized technologies in the Kyrgyz Republic, resulting from the TNA project implementation.

The TAP is a concise plan outlining the adoption, dissemination, and transfer of priority technologies contributing to the country's social, environmental, economic development, and climate change mitigation. It encompasses specific actions derived from the analysis of barriers and enabling conditions.

Developed following the UNEP CCC guidance[1] this report focuses on two mitigation sectors: energy and solid waste. Selection was based on GHG emissions inventory, mitigation scenarios until 2050, time series for 2000-2020, trends, and recommendations from relevant Kyrgyz Republic departments, aligned with the country's development priorities.

Following the TNA methodology, national experts compiled a long list of technologies and technical fact sheets (TFS) for each sector. Prioritization criteria spanned economic, social, environmental, climate, and institutional-political groups. Three technologies were identified as priorities for mitigation sectors based on a Multi Criteria Analysis (MCA) approach[2].

Building on the second edition of the UNEP CCC guide, "Overcoming Barriers to the Transfer and Dissemination of Climate Technologies," the report aimed to identify and remove barriers to technology transfer[3]. An industry technology working group, representing stakeholders, facilitated the barrier analysis process. Logical problem analysis (LPA) and problem trees were employed to understand cause-and-effect relationships among barriers[4].

Market mapping techniques, including stakeholder consultations, informed the categorization of barriers and identification of cross-technology relationships. The subsequent phase involved working groups identifying measures to support technology transfer. In collaboration with the barrier analysis, logical problem analysis (LPA) was employed to determine and describe measures for overcoming barriers. The proposed measures were evaluated based on their financial and economic profiles and the incentive measures.

The National Supervisory Council oversees project implementation, consisting of deputy ministers from relevant ministries, fostering efficient multi-stakeholder decision-making and promoting awareness of technology needs assessment. The TNA project, funded by Green Climate Fund Readiness allocation, is coordinated by the Ministry of Natural Resources, Ecology and Technical Supervision, the project is executed by UNEP through the CTCN and the Copenhagen Climate Center.

Sectoral technology working groups, representing stakeholders, were formed to organize the TAP process. National consultants adopted a collaborative approach, engaging stakeholders in two working groups focused on energy and waste sectors.

[1] https://tech-action.unepccc.org/tna-methodology/
[2] https://tech-action.unepccc.org/wp-content/uploads/sites/2/2019/05/final-mca-guidance-mitigation-september2015-1.pdf
[3] https://tech-action.unepccc.org/publications/identifying-and-prioritising-technologies-for-mitigation/
[4] http://www.tech-action.org

The TAP process began with a national needs-focused analysis, followed by a desk study of policies and technical documents. Consultations involved direct meetings, interviews, and surveys with stakeholders. Draft Technology Action Plans (TAPs) were presented, discussed, and refined through stakeholder meetings.

The action plans were developed to overcome barriers for each technology, discussed in group working sessions with stakeholders. The plans underwent revisions based on meeting recommendations and were approved by the National Supervisory Council, ensuring alignment with UNFCCC requirements.

Each action plan details the sector, goals, list of actions, funding sources, responsible bodies, timelines, risks, success criteria, monitoring indicators, and budgets. Priority technologies are elaborated in the First Technology Needs Assessment Report, with the second report focusing on Barrier Analysis and Incentive Framework.

Emphasizing that all analysed technologies within the project have real opportunities for financing and implementation, the reports provide comprehensive insights into the supporting framework and market mapping for these technologies. The TAPs were used to inform the elaboration of project-specific Concept Notes for the GCF, which is the final stage deliverables of the TNA project.

2. Technology action plan and project ideas for the Waste sector

2.1. TAP for the Waste sector

Necessary actions for the introduction and dissemination of technologies in the Waste sector were selected based on working discussions and barriers identified in previous stages of the project, the implementation of proposed measures to overcome barriers and the interconnectedness of creating an enabling framework. The purpose of the action is to remove barriers and implement proposed measures to create an enabling environment in the Waste sector, as well as for the transfer and dissemination of the mentioned technologies.

The actions presented below in the Waste sector have been identified based on the results of discussions with stakeholders/stakeholders in various formats and are guided by the National Development Strategy of the Kyrgyz Republic for 2018-2040[5],Green Economy Development Program in the Kyrgyz Republic for 2019-2023.[6], National Development Program of the Kyrgyz Republic until 2026[7].

The key objectives of the above strategic documents are:

- taking measures to reduce the level of their formation (introduction of low-waste, resource-saving technologies), recycling, recycling, safe disposal;
- introduction of economic mechanisms to promote recycling, with the extraction of useful components, waste, including electronic and electrical waste;
- development of cost-effective infrastructure for the processing and disposal of household waste in cities, reduction of specific fuel use in the production of electrical and thermal energy;

[5]National Development Strategy of the Kyrgyz Republic for 2018-2040https://www.gov.kg/ru/programs/8
[6]Green Economy Development Program in the Kyrgyz Republic for 2019-2023.https://mineconom.gov.kg/ru/direct/302/335
[7]National Development Program of the Kyrgyz Republic until 2026http://cbd.minjust.gov.kg/act/view/ru-ru/430700

- development and implementation of economic mechanisms for waste recycling (recycling fees, tax incentives and preferences for waste recyclers, etc.);
- development of a state program for greening the collection, disposal and processing of solid waste, including issues of introducing mandatory separate waste collection, stimulating the development of solid waste processing enterprises, introducing administrative and other responsibility of producers and consumers for improper collection and disposal of household waste, developing healthy competition in the household waste management market waste, establishing standards for the processing and storage of solid waste using new technologies, creating a regulatory framework to control the collection, transportation, processing, disposal and storage of solid waste;
- the introduction of waste sorting, waste processing and waste incineration facilities in cities, the introduction of a complete ban on the burning of solid household waste (except for specialized permits) and the introduction of appropriate administrative and other penalties for violators;
- reducing the volume of industrial waste by taking measures for recycling, reuse, and safe disposal;
- stimulating the transition to alternative energy sources and increasing the energy efficiency of the technologies used to reduce emissions in the heating and utilities sector;
- strengthening control over wastewater treatment plants of cities and economic entities, especially those located in the coastal zone of Lake Issyk-Kul, with support for the introduction of modern technologies;
- informing and involving the public in the problem of safe waste disposal.

2.1.1. Waste sector overview

Today, in the Kyrgyz Republic, the problem of reducing, disposing and processing solid household waste is important due to the growing amount of accumulated and annually generated waste, requiring the allocation of large areas for their disposal. The demographic situation in the republic tends to increase the population, which creates new preconditions for increasing the volume of generated solid household waste.

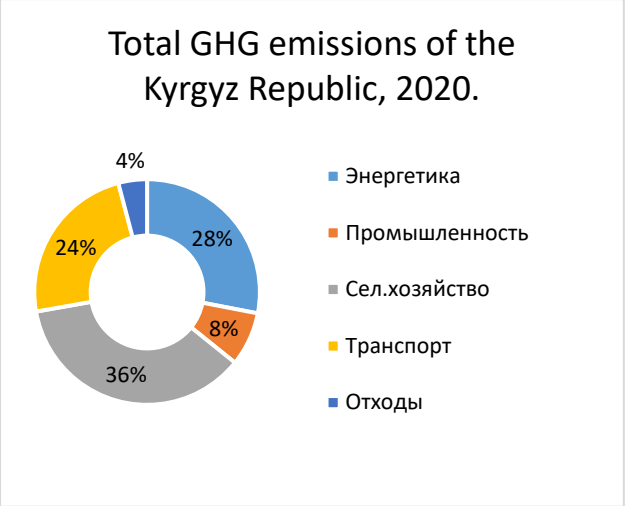
According to statistics, 1.2 million tons of solid household waste were removed in 2020, of which about half (49.4%) was household waste. More than 70 percent of the municipal solid waste removed was from the cities of Bishkek, Osh and Chui region[8].

In the Kyrgyz Republic, solid waste is disposed of by disposal at sanitary landfills and unorganized landfills. As a result of an inventory of consumer waste disposal sites in the Kyrgyz Republic, as of 2018, 406 landfills were installed throughout the republic, which occupy about 616,306 hectares[9]. Of the 406 existing landfills, only 107 are authorized, sanitary protective zoning is not observed, there is practically no quantitative and qualitative accounting of waste, there is no data on the depth of waste disposal sites, regular observations of changes in the morphological composition are not carried out, standards for the accumulation of solid waste per capita and density of solid waste; no records are kept of the amount of waste processed.

According to the NIPG results, the Unmanaged Landfills subcategory accounts for about 57% of the total greenhouse gas emissions in the Waste sector in 2020. GHG emissions directly depend on the amount of waste disposed and, if steps are not taken to reduce the amount of waste disposed and

[8] http://www.stat.kg/media/publicationarchive/aff32455-587b-478f-b293-07087a033cb6.pdf, page 11
[9] http://eco-expertise.org/wp-content/uploads/2009/06/201805251451523.pdf

recycled, emissions from this subcategory will constantly increase. The subcategory Domestic wastewater accounts for 37%, industrial wastewater accounts for 2%. GHG emissions in the Open combustion category amounted to 3%, in the Composting category 1%[10].



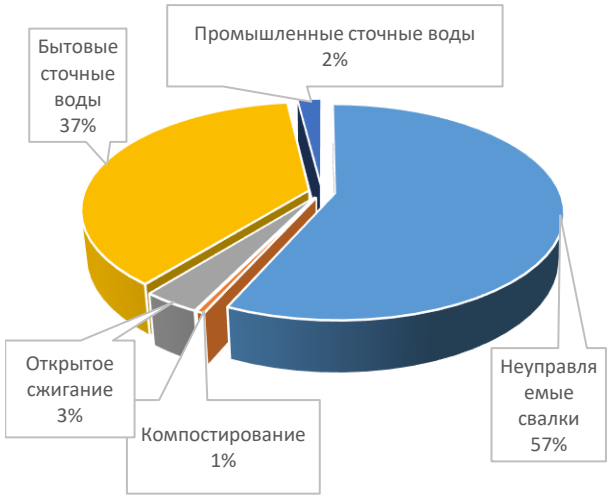


Fig.1. Total GHG emissions in the Kyrgyz Republic Fig.2. GHG emissions in the Waste sector

2.1.2. Action plan for the technology "Mechanical-biological treatment of solid waste" (MBT)

2.1.2.1 Introduction

Today, the problem of reducing, disposing and processing solid household waste is important due to the growing amount of accumulated and annually generated waste, requiring the allocation of large areas for their disposal. The demographic situation in the republic tends to increase the population, which creates new preconditions for increasing the volume of generated solid household waste. The growth of the urban population due to the increased level of migration from rural areas to cities makes a certain contribution to the deterioration of the socio-economic and environmental condition of cities. According to statistics, 1.2 million tons of solid household waste were removed in 2020, of which about half (49.4%) was household waste. More than 70 percent of the removed municipal solid waste occurs in the cities of Bishkek,

In the Kyrgyz Republic, solid waste is disposed of by disposal at sanitary landfills and unorganized landfills. As a result of an inventory of consumer waste disposal sites on the territory of the Kyrgyz Republic, as of 2018, 406 landfills were installed throughout the republic, which occupy about 616,306 hectares.

Currently, there are practically no large enterprises for processing solid household waste in the republic. Today, less than 10% of all generated household waste is used as secondary raw materials. Recycling is primarily confined to the private sector, and the infrastructure needed to increase recycling rates or move to separate collection is still lacking.

2.1.2.2. Ambitions for the TAP

[10]NIPG. Fourth National Communication, 2020

In the adopted National Development Program of the Kyrgyz Republic for the period 2018-2040. It is indicated that the policy of sustainable waste management should become an issue of national importance, implemented through intersectoral, interregional and intermunicipal interaction aimed at the complete elimination of spontaneous landfills, preventing the expansion of new ones and the reduction of the territory of existing landfills. During the implementation of the National Program, measures will be taken to reduce the level of their education (introduction of low-waste, resource-saving technologies), recycling, reuse, and safe disposal. In parallel, economic mechanisms will be introduced to facilitate recycling with the extraction of useful components.

On July 29, 2023, the Law of the Kyrgyz Republic "On Production and Consumption Waste" was adopted, which filled the gaps in the field of waste management. Thus, the law is supplemented with such concepts as "recycled raw materials", "secondary material resources", "waste disposal", "municipal waste", "waste recycling" and others. Norms of ownership of waste and transactions with it have also been introduced, since waste can acquire value during further processing. In order to achieve more complete control in the field of waste management, the powers of the executive authority in the field of waste management are being strengthened.

The use of the "Mechanical-biological processing" technology corresponds to the economic, climatic and environmental development priorities of the country, which are aimed at solving issues related to the recycling of waste, minimizing its formation, safe collection, processing and neutralization. Therefore, the introduction and dissemination of this technology is a solution to both the issue of reducing disposed waste and using it as a raw material for processing.

2.1.2.3. Activities and activities selected for inclusion in the TAP

Barriers associated with the implementation of this technology in waste management were identified in seven categories: 1) Economic/financial; 2) Market; 3) Legal; 4) Institutional; 5)Human Resources/Capacity Building; 6) Technical; 7) Informational.

The barriers identified in the field of waste management are interconnected and appropriate measures have been recommended to overcome these barriers, as well as create favorable conditions for the development of technologies. The main barriers included: high costs of investment and operation, low tariffs, imperfect legal framework in the field of management of solid household waste and secondary resources, as well as personnel, technical and information.

Measures to overcome barriers were also identified for each technology, and the project team developed corresponding technology action plans. Using LPA, the working groups were able to collect the main characteristics of problems, apply logical analysis of interrelated elements, and identify connections between problem components and external factors.

Analysis of the measures showed that the TAP needs to include the following actions:

- attracting investment through public-private partnership (PPP);
- improvement of the legislation of the Kyrgyz Republic in the field of solid waste management
- development of a state program for waste management;
- strengthening the current system of state regulatory institutions in the field of waste management;
- development of special requirements for waste processing enterprises, as well as processing technologies;

- increasing the level of awareness of the population about the separate collection of solid household waste at the places of generation and collection.

Actions selected for inclusion in the TAP

- attracting investment through public-private partnership (PPP). The use of PPP in the waste management sector requires effective interaction between the state and business, pooling of resources and potential, which makes it possible to find solutions that reconcile environmental requirements and requirements for the quality of services with the economic opportunities of business and consumers of utility services.
- revision of tariffs for waste removal, support and development of the recycling sector. The tariff system should: ensure coverage of current and capital costs, stimulate producers and consumers to more rational waste management, support the solid waste processing sector;
- capacity building, trained and qualified personnel are required for proper plant management and control of technological operations;
- increasing the level of awareness of the population about the separate collection of solid household waste at the places of generation and collection.

To implement the selected actions, it is necessary to take practical steps, primarily in the category of normative/legal and regulatory acts. Thus, the Government of the Kyrgyz Republic needs to instruct the authorized ministries and departments to develop a package of regulations, and then adopt them to launch the implementation of a separate waste collection system, develop mechanisms to encourage the population for separate collection, develop a strategy/program for sustainable waste management and secondary resources, special requirements for waste processing enterprises, as well as recycling technologies.

The state support system should also include increasing awareness and informing the population about the separate collection of solid waste at the places of generation and collection.

The measure “Monitoring changes in the morphological composition, studying the accumulation rates, density of solid household waste” should be implemented as an independent project, which with practical steps can provide support in obtaining information on the morphological composition of waste by season, density and accumulation rates. Obtaining this information will ensure effective planning and management of waste management, determining the actual content of useful components suitable for recycling.

2.1.2.5.Stakeholders and timing of TAP implementation

The Kyrgyz Republic ratified the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) in 2019 with the relevant law, which makes it mandatory for Kyrgyzstan to implement all provisions of the Paris Agreement. The government of the Kyrgyz Republic is the main stakeholder in the implementation of the TAP to reduce GHG emissions, improve the environmental situation, and reduce the level of disease in the republic.

Target group interested in this TAP:

- policy and decision makers;
- national stakeholders represented from the business sector, consumers (population), civil society (NGOs);
- international donor organizations and investors.

To overcome these and other important barriers described above, the following planned actions must be implemented in the process of technology diffusion:

1. Bishkek City Hall, represented by the Bishkek City Development and Investment Attraction Agency, which is an authorized body within the structure of the Bishkek City Hall, carrying out the functions of developing and implementing investment policy:

a) during 2023-2024, together with interested business representatives, will conduct a thorough analysis of the costs and benefits of introducing technology in Kyrgyzstan; it is also necessary to conduct a preliminary feasibility study. If necessary, to achieve the goal, the City Hall will turn to donors for appropriate technical assistance;

b) in 2024, will develop a list of necessary documents for creating a State Support System and attracting foreign investment for the development of technology in the country, together with the Ministry of Economy;

In this regard, a corresponding decision of the Government should be published in order to increase the feasibility of the project and attract foreign investment to the project.

2. Ministry of Economy:

a) in 2024-2025, develop a set of regulations to create a financial support system for the implementation of technology and initiate their adoption by the Government of the Kyrgyz Republic;

b) in 2025, determine the need for exemption from import duties on equipment necessary for the implementation of the technology.

State Agency for Architecture, Construction and Housing and Communal Services under the Cabinet of Ministers of the Kyrgyz Republic:

A more detailed Technology Diffusion Action Plan, indicating the pre-established level of priority of measures, is presented in Table 2.1.2.8.

2.1.2.6.Assessing the resources needed for actions and activities

Building the capacity of decision-makers and specialists of the involved ministries and departments is one of the important areas for carrying out actions and activities. It may be advisable to identify target audiences for information measures (not only the general population, but narrow target groups “within” entrepreneurs), in specific areas of economic activity, for example, collection of secondary raw materials, recycling points.

Capacity building must be done through: information; familiarization with the best world practices; development of manuals and methodological material adapted for Kyrgyzstan with the involvement of local specialists; as well as regulatory documents for specialists.

The first stage requires the installation of a mobile sorting line with 15 posts. The total volume of processed solid waste will be about 50 tons per year. This measure is necessary for immediate solutions to issues of reducing the volume of buried solid waste and the removal of useful fractions. This sorting line will operate until the construction of the MBO. The estimated cost of a mobile sorting line is 2-2.5 million US dollars.

The estimated cost of constructing an MBO in the amount of up to 400 thousand tons will be 45-50 million US dollars. The exact cost will be determined when the feasibility study and feasibility study for the project are developed.

When assessing the activities, the expert was guided by experience in working in the NDC, in drawing up the implementation plan for the activities, as well as through consultations with stakeholders, and therefore the financial assessment may be subjective and indicative.

2.1.2.7.Management planning

2.1.2.7.1. Risks and contingency planning

Kyrgyzstan experienced a period of political turmoil in 2010-2011, but the country has developed a political system more oriented towards democracy. The government has set ambitious goals, which, in particular, are aimed at combating corruption and improving the investment climate. Political risks remain and they are associated mainly with the frequent change of heads of the Government, ministries and departments. It is required to increase the capacity of specialists who will be responsible for the development and adoption of many regulations to support the promotion and implementation of technology in the field.

These risks may affect the successful dissemination of the technology and should be taken into account when developing an action plan and implementing the project as a whole.

2.1.2.7.2. Next steps

Further steps to promote TAP are as follows:

- Expedite formalization of the TAP for submission to the National Steering Committee (NSC) for approval
- Launching the preparation process for developing a project concept for submission to the GCF
- Development of a project application based on the TAP as a demonstration of the specific use of the provisions of the TAP.
- Prepare TAP for approval by the leadership of the City Hall.
- Post the TAP on the Focal Point Convention and City Hall website

2.1.2.8.General TAP table

TAP overview table								
Sector	Waste							
Subsector	Waste disposal							
Technologies	Mechanical-biological processing							
Ambition	**Reducing GHG emissions from waste disposal**							
Advantages	Reducing the amount of waste disposed at a sanitary landfill, and, accordingly, the release of pollutants generated from the waste disposal process, a source of recyclable materials for processing, improving the state of the environment, reducing the area allocated for waste disposal.							
Action	**Activities to be implemented**	**Sources of financing**	**Responsible authority and focal point**	**Time frame**	**Risks**	**Success criterion**	**Indicators for monitoring implementation**	**Budget by Action $US, million dollars**
Action 1. Expanding access to financial resources	1.1 Preparation of the state programon sustainable management of waste and secondary resources	RB, MPR	MPRETN	2024-2025	Lack of financial resources in the Republic of Belarus	A new program for sustainable management of waste and secondary resources has been approved	Document	0.025
	1.2.Adoption/introduction of changes to regulatory documentsto introduce a separate waste collection system	RB, MPR	MPRETN, City Hall	2024-2025	Poor collaboration between stakeholders	A separate waste collection system has been developed and adopted	Document	0.1
	1.3. Develop mechanisms to encourage the population for separate collection	RB, MPR	MPRETN, Ministry of Economy, City Hall	2024-2025	Poor collaboration between stakeholders	Mechanisms to encourage the population for separate collection are reflected in national legislation	Document	0.02

Action 2. Development and launch of a state support system	Activity 2.1 Carrying out, together with interested business representatives, a thorough analysis of the costs and benefits of introducing the technology, a preliminary feasibility study (feasibility study)	RB, MPR	MPRETN	2023-2024	Political. Dependence on grants	Pre-feasibility study agreed with stakeholders	Feasibility study report	0.2
	Activity 2.2 Development of a list of necessary documents to create a regulatory framework for creating a system of state support and attracting foreign investment for the development of technology in the country	RB, MPR	City Hall, Ministry of Economy	2024	Political	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	List of specific regulations	0.02
Action 3. Creation of a financial support system for technology implementation	Activity 3.1 Publication of the Government decision to increase the feasibility of the project and attract foreign investment to the project	RB	Government of the Kyrgyz Republic	2024	Political	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Decree of the Government of the Kyrgyz Republic	0.002
	Activity 3.2. Launch of an ongoing program to raise awareness of the climate benefits of recycling	RB, MPR	Ministry of Culture and Information. Ministry of Digital Development	2024	Political . Dependence on grants	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Publications in the media, the Internet, social networks	0.1
	Activity 3.3 Development of a set of regulations to create a system of financial support for the implementation of technology and initiates their adoption by the Government of the Kyrgyz Republic	RB, MPR	Ministry of Economics	2024-2025	Politically. Dependence on grants	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	List of draft specific regulations	0.1

	Action 3.4 Exemption from import duties on necessary equipment	RB	Ministry of Economics	2025	Political	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Draft resolution and justification for the Government of the Kyrgyz Republic	0.01
	Activity 3.5 Publication of the decision on adoption by the Government in order to increase the feasibility of the project and attract foreign investment to the project	RB	Government of the Kyrgyz Republic	2025	Political	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Decree of the Government of the Kyrgyz Republic	0.002
Action 4. Pre-feasibility study assessment, project development and implementation	Activity 4.1 Feasibility Study Assessment	RB, MPR	City Hall	2024-2026	Political.	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Feasibility study	0.5
	Activity 4.2 Preparation of tender packages and organization of tenders for the implementation of the project.	RB, MPR	Ministry of Environment. Climate Finance Center	2025-2026	Political.	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Providing permission to conduct financial transactions on the project. Application to the Climate Fund	0.01
	Activity 4.3 Implementation of projects by the winning bidder	MPR	Ministry of Environment. Climate Finance Center	2025-2027	Political.	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Providing permission to conduct financial transactions on the project. Application to the Climate Fund	50.0
Action 5. Raising public awareness about	5.1.Increasing awareness and awareness of the population about the separate collection	RB, MPR	City Hall	2024-2025	Weak cooperation between government		Communication products developed	0.4

separate waste collection	of solid household waste at the places of generation and collection.				agencies and the media			
	5.2.Conducting information campaigns	RB, MPR	City Hall	2024-2025	Weak cooper-ation between government agencies and the media		Information campaigns carried out	0.3

2.1.3. Action plan for the technology "Use of organic waste as raw material for a biogas plant"

2.1.3.1 Introduction

The accumulation of household and industrial waste is a pressing environmental problem. According to forecast data, in the Kyrgyz Republic the amount of disposed municipal solid waste in 2030 under the "Business as usual" scenario will reach 1381.5 thousand tons, which will require both additional space (land resources) and additional financial costs for disposal. The amount of organic waste transported to the sanitary landfill is 49% of the total composition of household waste. As it stands, in the Kyrgyz Republic organic waste (food) is not used as a raw material for biogas plants, and there is no system for separate collection and sorting at the sites where food waste is generated.

2.1.3.2.Ambitions for TAP

During the implementation of the National Development Program of the Kyrgyz Republic until 2026, measures will be taken to reduce the level of their education (introduction of low-waste, resource-saving technologies), recycling, recycling, and safe disposal. In parallel, economic mechanisms will be introduced to facilitate recycling with the extraction of useful components. Particular attention will be paid to the development of cost-effective infrastructure for the processing and disposal of household waste in cities.

On July 29, 2023, the Law of the Kyrgyz Republic "On Production and Consumption Waste" was adopted, which filled the gaps in the field of waste management. Thus, the law is supplemented with such concepts as "recycled raw materials", "secondary material resources", "waste disposal", "municipal waste", "waste recycling" and others. Norms of ownership of waste and transactions with it have also been introduced, since waste can acquire value during further processing. In order to achieve more complete control in the field of waste management, the powers of the executive authority in the field of waste management are being strengthened.

The use of the technology "Use of organic waste as raw material for a biogas plant" corresponds to the economic, climatic and environmental development priorities of the country, which are aimed at solving issues related to the recycling of waste, minimizing its formation, safe collection, processing and neutralization. Therefore, the introduction and dissemination of this technology is a solution to both the issue of reducing disposed waste and, accordingly, reducing methane emissions from it, and using it as a raw material for biogas production.

2.1.2.3.Activities and activities selected for inclusion in the TAP

Barriers associated with the implementation of this technology in waste management were identified in seven categories: 1) Economic/financial; 2) Market; 3) Legal; 4) Institutional; 5) Human Resources/Capacity Building; 6) Technical; 7) Informational.

The barriers identified as a result of the analysis of the technology "Use of organic waste as raw material for a biogas plant" are identified in the following main categories: economic/financial barriers, market conditions, legal, institutional, capacity building/human resources, technical, information and awareness. One of the waspsnew barriers to the introduction of the technology "Use of organic waste as raw materials for a biogas plant" is the lack of a state program for waste management and the imperfection of the legal framework in the field of management of municipal solid waste and secondary resources

To overcome the identified financial barriers, it is planned to take the following measures: first of all, this is the development of projects with the aim of receiving investments from external donors, attracting external investors, allocating additional funds from the budget for the introduction of separate collection of solid waste.

Analysis of the measures showed that the TAP needs to include the following actions:

- attracting investment through public-private partnership (PPP);
- improvement of the legislation of the Kyrgyz Republic in the field of solid waste management
- development of a state program for waste management;
- strengthening the current system of state regulatory institutions in the field of waste management;
- to ensure the implementation of technology, it is necessary to organize a rational waste collection system, providing for the separate collection of food waste at the places of its generation;
- development of special requirements for waste processing enterprises, as well as processing technologies;
- increasing the level of awareness of the population about the separate collection of food waste at the places of generation and collection.

Actions selected for inclusion in the TAP

- attracting investment through public-private partnership (PPP). The use of PPP in the waste management sector requires effective interaction between the state and business, pooling of resources and potential, which makes it possible to find solutions that reconcile environmental requirements and requirements for the quality of services with the economic opportunities of business and consumers of utility services;
- to support and develop the solid waste processing sector, it is necessary to include in the tariff such waste management operations as the collection and processing of food waste;
- capacity building, trained and qualified personnel are required for proper plant management and control of technological operations;
- increasing the level of awareness of the population about the separate collection of solid household waste at the places of generation and collection.

To implement the selected actions, it is necessary to take practical steps, primarily in the category of normative/legal and regulatory acts. Thus, the Government of the Kyrgyz Republic needs to instruct authorized ministries and departments to develop a package of regulations, and then adopt them to launch the implementation of a system of separate collection of food waste, develop mechanisms to encourage the population for separate collection, develop a strategy/program for sustainable management of waste and secondary resources, special requirements to waste processing enterprises, as well as recycling technologies.

The state support system should also include raising awareness and informing the population about the separate collection of food waste at the places of generation and collection.

2.1.2.4.Stakeholders and timing of TAP implementation

The Kyrgyz Republic ratified the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) in 2019 with the relevant law, which makes it mandatory for Kyrgyzstan to implement all provisions of the Paris Agreement. The government of the Kyrgyz Republic is the main stakeholder in the implementation of the TAP to reduce GHG emissions, improve the environmental situation, and reduce the level of disease in the republic.

Target group interested in this TAP:

- policy and decision makers;
- national stakeholders represented from the business sector, consumers (population), civil society (NGOs);
- international donor organizations and investors.

To overcome these and other important barriers described above, the following planned actions must be implemented in the process of technology diffusion:

2. Bishkek City Hall, represented by the Bishkek City Development and Investment Attraction Agency, which is an authorized body within the structure of the Bishkek City Hall, carrying out the functions of developing and implementing investment policy:

a) during 2023-2024, together with interested business representatives, will conduct a thorough analysis of the costs and benefits of introducing technology in Kyrgyzstan; it is also necessary to conduct a preliminary feasibility study. If necessary, to achieve the goal, the City Hall will turn to donors for appropriate technical assistance;

b) in 2024, will develop a list of necessary documents for creating a State Support System and attracting foreign investment for the development of technology in the country, together with the Ministry of Economy;

In this regard, a corresponding decision of the Government should be published in order to increase the feasibility of the project and attract foreign investment to the project.

2. Ministry of Economy:

a) in 2024-2025, develop a set of regulations to create a financial support system for the implementation of technology and initiate their adoption by the Government of the Kyrgyz Republic;

b) in 2025, determine the need for exemption from import duties on equipment necessary for the implementation of the technology.

State Agency for Architecture, Construction and Housing and Communal Services under the Cabinet of Ministers of the Kyrgyz Republic:

A more detailed Technology Dissemination Action Plan, indicating a pre-determined level of priority for measures, is presented in Table 2.1.2.7.

2.1.2.5.Assessing the resources needed for actions and activities

Building the capacity of decision-makers and specialists of the involved ministries and departments is one of the important areas for carrying out actions and activities. It may be advisable to identify target audiences for information measures (not only the population as a whole, but narrow target groups “within” entrepreneurs), in specific areas of economic activity, for example, enterprises that generate food waste.

Capacity building must be done through: information; familiarization with the best world practices; development of manuals and methodological material adapted for Kyrgyzstan with the involvement of local specialists; as well as regulatory documents for specialists.

The estimated cost of the biogas plant will be 1.0 million US dollars. The exact cost will be determined when the feasibility study and feasibility study for the project are developed.

When assessing the activities, the expert was guided by experience in working in the NDC, in drawing up the implementation plan for the activities, as well as through consultations with stakeholders, and therefore the financial assessment may be subjective and indicative.

2.1.2.6.Management planning

2.1.2.6.1. Risks and contingency planning

Kyrgyzstan experienced a period of political turmoil in 2010-2011, but the country has developed a political system more oriented towards democracy. The government has set ambitious goals, which, in particular, are aimed at combating corruption and improving the investment climate. Political risks remain and they are associated mainly with the frequent change of heads of the Government, ministries and departments. It is required to increase the capacity of specialists who will be responsible for the development and adoption of many regulations to support the promotion and implementation of technology in the field.

These risks may affect the successful dissemination of the technology and should be taken into account when developing an action plan and implementing the project as a whole.

2.1.2.6.2. Next steps

Further steps to promote TAP are as follows:

- Expedite formalization of the TAP for submission to the National Steering Committee (NSC) for approval
- Launching the preparation process for developing a project concept for submission to the GCF
- Development of a project application based on the TAP as a demonstration of the specific use of the provisions of the TAP.
- Prepare TAP for approval by the leadership of the City Hall.
- Post the TAP on the Focal Point Convention and City Hall website

2.1.2.7.General TAP table

TAP overview table								
Sector	Waste							
Subsector	Waste disposal							
Technologies	"Use of organic waste as raw material for a biogas plant"							
Ambition	**Reducing GHG emissions from waste disposal**							
Advantages	Reducing the amount of waste disposed at a sanitary landfill, and, accordingly, the release of pollutants generated from the waste disposal process, a source of recyclable materials for processing, improving the state of the environment, reducing the area allocated for waste disposal.							
Action	**Activities to be implemented**	**Sources of financing**	**Responsible authority and focal point**	**Time frame**	**Risks**	**Success criterion**	**Indicators for monitoring implementation**	**Budget by Action $US, million dollars**
Action 1. Expanding access to financial resources	1.1 Preparation of the state programon sustainable management of waste and secondary resources	RB, MPR	MPRETN	2024-2025	Lack of financial resources in the Republic of Belarus	A new program for sustainable management of waste and secondary resources has been approved	Document	0.025
	1.2.Adoption/introduction of changes to regulatory documentsto introduce a system for separate collection of food waste	RB, MPR	MPRETN, City Hall	2024-2025	Poor collaboration between stakeholders	A separate waste collection system has been developed and adopted	Document	0.1
	1.3. Develop mechanisms to encourage the population for separate collection of food waste	RB, MPR	MPRETN, Ministry of Economy, City Hall	2024-2025	Poor collaboration between stakeholders	Mechanisms to encourage the population for separate collection are reflected in national legislation	Document	0.02

Action 2. Development and launch of a state support system	Activity 2.1 Carrying out, together with interested business representatives, a thorough analysis of the costs and benefits of introducing the technology, a preliminary feasibility study (feasibility study)	RB, MPR	MPRETN	2023-2024	Political. Dependence on grants	Pre-feasibility study agreed with stakeholders	Feasibility study report	0.2
	Activity 2.2 Development of a list of necessary documents to create a regulatory framework for creating a system of state support and attracting foreign investment for the development of technology in the country	RB, MPR	City Hall, Ministry of Economy	2024	Political	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	List of specific regulations	0.02
Action 3. Creation of a financial support system for technology implementation	Activity 3.1 Publication of the Government decision to increase the feasibility of the project and attract foreign investment to the project	RB	Government of the Kyrgyz Republic	2024	Political	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Decree of the Government of the Kyrgyz Republic	0.002
	Activity 3.2. Launch of an ongoing program to raise awareness of the climate benefits of recycling	RB, MPR	Ministry of Culture and Information. Ministry of Digital Development	2024	Political . Dependence on grants	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Publications in the media, the Internet, social networks	0.1
	Activity 3.3 Development of a set of regulations to create a system of financial support for the implementation of technology and initiates their adoption by the Government of the Kyrgyz Republic	RB, MPR	Ministry of Economics	2024-2025	Politically. Dependence on grants	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	List of draft specific regulations	0.1

	Action 3.4 Exemption from import duties on necessary equipment	RB	Ministry of Economics	2025	Political	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Draft resolution and justification for the Government of the Kyrgyz Republic	0.01
	Activity 3.5 Publication of the decision on adoption by the Government in order to increase the feasibility of the project and attract foreign investment to the project	RB	Government of the Kyrgyz Republic	2025	Political	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Decree of the Government of the Kyrgyz Republic	0.002
Action 4. Pre-feasibility study assessment, project development and implementation	Activity 4.1 Feasibility Study Assessment	RB, MPR	City Hall	2024-2026	Political.	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Feasibility study	0.2
	Activity 4.2 Preparation of tender packages and organization of tenders for the implementation of the project.	RB, MPR	Ministry of Environment. Climate Finance Center	2025-2026	Political.	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Providing permission to conduct financial transactions on the project. Application to the Climate Fund	0.01
	Activity 4.3 Implementation of projects by the winning bidder	MPR	Ministry of Environment. Climate Finance Center	2025-2027	Political.	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Providing permission to conduct financial transactions on the project. Application to the Climate Fund	1.0

2.1.3. Action plan for the technology "Use of organic waste as raw material (wastewater) for a biogas plant"

2.1.3.1 Introduction

The National Statistical Committee does not regularly collect data on the amount of sludge generated and the volume placed at storage sites, and there is no information on its further use. Reporting to the National Statistical Committee is carried out on the volume of wastewater passed through treatment facilities, thousand m3/year. Also, a big problem is the wear and tear of existing treatment facilities. According to the Bishkekvodokanal PA, the aeration station (sewage treatment plant) of the city of Bishkek was built in the 70s of the last century. The wastewater treatment plant is located in the village of Prigorodnoye and serves not only the city of Bishkek, but also partially the Chui region. Currently, in the Kyrgyz Republic, organic waste (wastewater) is not used as a raw material for biogas plants.

2.1.3.2.Ambitions for the TAP

During the implementation of the National Development Program of the Kyrgyz Republic until 2026, measures will be taken to reduce the level of their education (introduction of low-waste, resource-saving technologies), recycling, recycling, and safe disposal. In parallel, economic mechanisms will be introduced to facilitate recycling with the extraction of useful components. Particular attention will be paid to the development of cost-effective infrastructure for the processing and disposal of household waste in cities.

In 2023, within the framework of the international project "Rehabilitation of water supply and sewerage systems in the city of Bishkek", financed by the Government of the Swiss Confederation and the EBRD, it is planned to complete the construction of a sewerage collector with a length of 11 km. The pipeline will connect the new sewer line with the Bishkek wastewater treatment plant. Social facilities, private and apartment buildings in the southwestern part of the city will be connected to sewer networks. And this is an additional load on the station.

Obviously, from the current situation, the introduction of the technology "Use of wastewater as raw material for a biogas plant" will require additional financial investments for the reconstruction of wastewater treatment facilities in Bishkek.

2.1.3.3.Activities and activities selected for inclusion in the TAP

Barriers associated with the implementation of this technology in waste management were identified in seven categories: 1) Economic/financial; 2) Market; 3) Legal; 4) Institutional; 5) Human Resources/Capacity Building; 6) Technical; 7) Informational.

The barriers identified as a result of the analysis of the technology "Use of organic waste as raw material for a biogas plant" are identified in the following main categories: economic/financial barriers, market conditions, legal, institutional, capacity building/human resources, technical, information and awareness. One of the waspsnew barriers to the introduction of the technology "Use of organic waste as raw materials for a biogas plant" is the lack of a state program for waste management and the imperfection of the legal framework in the field of management of municipal solid waste and secondary resources

To overcome the identified financial barriers, it is planned to take the following measures: first of all, this is the development of projects with the aim of receiving investments from external donors,

attracting external investors, allocating additional funds from the budget for the introduction of separate collection of solid waste.

The main barriers to this technology were identified as:

- high cost of capital, investments in technology are considered risky;
- low expected rate of return, low tariffs for water consumption and wastewater disposal.
- the absence of an industry-specific regulatory legal act to regulate tariffs in the sector of domestic and drinking water supply and sanitation;
- lack of a program for the development of renewable energy sources;
- lack of specialists in the field of sustainable waste management;
- the problem of further maintenance of biogas plants due to the lack of local service companies and;
- lack of positive practice in applying this Technology in the Kyrgyz Republic.

Actions selected for inclusion in the TAP

- attracting investment through public-private partnership (PPP). The use of PPP in the waste management sector requires effective interaction between the state and business, pooling of resources and potential, which makes it possible to find solutions that reconcile environmental requirements and requirements for the quality of services with the economic opportunities of business and consumers of utility services.
- the absence of an industry-specific regulatory legal act to regulate tariffs in the sector of domestic and drinking water supply and sanitation;
- lack of a program for the development of renewable energy sources.

To implement the selected actions, it is necessary to take practical steps, primarily in the category of normative/legal and regulatory acts. Thus, the Government of the Kyrgyz Republic needs to entrust the authorized ministries and departments with a program for the development of renewable energy sources, special requirements for waste processing enterprises, as well as processing technologies.

2.1.3.4.Stakeholders and timing of TAP implementation

The Kyrgyz Republic ratified the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) in 2019 with the relevant law, which makes it mandatory for Kyrgyzstan to implement all provisions of the Paris Agreement. The government of the Kyrgyz Republic is the main stakeholder in the implementation of the TAP to reduce GHG emissions, improve the environmental situation, and reduce the level of disease in the republic.
Target group interested in this TAP:

- policy and decision makers;
- national stakeholders represented from the business sector, consumers (population), civil society (NGOs);
- international donor organizations and investors.

To overcome these and other important barriers described above, the following planned actions must be implemented in the process of technology diffusion:

3. Department for the Development of Drinking Water Supply and Sanitation under the State Agency for Architecture:

a) during 2023-2024, together with interested business representatives, will conduct a thorough analysis of the costs and benefits of introducing technology in Kyrgyzstan; it is also necessary to conduct a preliminary feasibility study. If necessary, to achieve the goal, the Department will seek appropriate technical assistance from donors;

b) in 2024, will develop a list of necessary documents for creating a State Support System and attracting foreign investment for the development of technology in the country, together with the Ministry of Economy;

In this regard, a corresponding decision of the Government should be published in order to increase the feasibility of the project and attract foreign investment to the project.

2. Ministry of Economy:

a) in 2024-2025, develop a set of regulations to create a financial support system for the implementation of technology and initiate their adoption by the Government of the Kyrgyz Republic;

b) in 2025, determine the need for exemption from import duties on equipment necessary for the implementation of the technology.

A more detailed Technology Diffusion Action Plan, indicating the pre-established priority level of measures, is presented in Table 2.1.3.7.

2.1.3.5.Assessing the resources needed for actions and activities

Building the capacity of decision-makers and specialists of the involved ministries and departments is one of the important areas for carrying out actions and activities. Capacity building must be done through: information; familiarization with the best world practices; development of manuals and methodological material adapted for Kyrgyzstan with the involvement of local specialists; as well as regulatory documents for specialists.

The estimated cost of the biogas plant will be 0.14 million US dollars. The exact cost will be determined when the feasibility study and feasibility study for the project are developed.

When assessing the activities, the expert was guided by experience in working in the NDC, in drawing up the implementation plan for the activities, as well as through consultations with stakeholders, and therefore the financial assessment may be subjective and indicative.

2.1.3.6.Management planning

2.1.3.6.1. Risks and contingency planning

Kyrgyzstan experienced a period of political turmoil in 2010-2011, but the country has developed a political system more oriented towards democracy. The government has set ambitious goals, which, in particular, are aimed at combating corruption and improving the investment climate. Political risks remain and they are associated mainly with the frequent change of heads of the Government, ministries and departments. It is required to increase the capacity of specialists who will be responsible for the development and adoption of many regulations to support the promotion and implementation of technology in the field.

These risks may affect the successful dissemination of the technology and should be taken into account when developing an action plan and implementing the project as a whole.

2.1.3.6.2. Next steps

Further steps to promote TAP are as follows:

- Expedite formalization of the TAP for submission to the National Steering Committee (NSC) for approval
- Launching the preparation process for developing a project concept for submission to the GCF
- Development of a project application based on the TAP as a demonstration of the specific use of the provisions of the TAP.
- Prepare TAP for approval by the leadership of the City Hall.
- Post the TAP on the Focal Point Convention and City Hall website

2.1.3.7.General TAP table

TAP overview table								
Sector	Waste							
Subsector	Waste disposal							
Technologies	"Use of organic waste as raw material for a biogas plant"							
Ambition	**Reducing GHG emissions from waste disposal**							
Advantages	Reducing the amount of waste disposed at a sanitary landfill, and, accordingly, the release of pollutants generated from the waste disposal process, a source of recyclable materials for processing, improving the state of the environment, reducing the area allocated for waste disposal.							
Action	**Activities to be implemented**	**Sources of financing**	**Responsible authority and focal point**	**Time frame**	**Risks**	**Success criterion**	**Indicators for monitoring implementation**	**Budget by Action $US, million dollars**
Action 1. Expanding access to financial resources	1.1 Preparation of the state programRES development	RB, MPR	MPRETN, Department for the Development of Drinking Water Supply and Sanitation under the State Agency for Architecture	2024-2025	Lack of financial resources in the Republic of Belarus	A new program for sustainable management of waste and secondary resources has been approved	Document	0.025
	1.2.Adoption/introduction of changes to regulatory documentswaste	RB, MPR	Department for the Development of Drinking Water Supply and Sanitation under the State Agency for Architectural Design	2024-2025	Poor collaboration between stakeholders	A separate waste collection system has been developed and adopted	Document	0.1
Action 2. Development and launch of a state support system	Activity 2.1 Carrying out, together with interested business representatives, a thorough analysis of the costs and benefits of introducing the technology, a preliminary feasibility study (feasibility study)	RB, MPR	MPRETN	2023-2024	Political. Dependence on grants	Pre-feasibility study agreed with stakeholders	Feasibility study report	0.2

	Activity 2.2 Development of a list of necessary documents to create a regulatory framework for creating a system of state support and attracting foreign investment for the development of technology in the country	RB, MPR	City Hall, Ministry of Economy	2024	Political	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	List of specific regulations	0.02
Action 3. Creation of a financial support system for technology implementation	Activity 3.1 Publication of the Government decision to increase the feasibility of the project and attract foreign investment to the project	RB	Government of the Kyrgyz Republic	2024	Political	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Decree of the Government of the Kyrgyz Republic	0.002
	Activity 3.2. Launch of an ongoing program to raise awareness of the climate benefits of recycling	RB, MPR	Ministry of Culture and Information. Ministry of Digital Development	2024	Political . Dependence on grants	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Publications in the media, the Internet, social networks	0.1
	Activity 3.3 Development of a set of regulations to create a system of financial support for the implementation of technology and initiates their adoption by the Government of the Kyrgyz Republic	RB, MPR	Ministry of Economics	2024-2025	Politically. Dependence on grants	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	List of draft specific regulations	0.1
	Action 3.4 Exemption from import duties on necessary equipment	RB	Ministry of Economics	2025	Political	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Draft resolution and justification for the Government of the Kyrgyz Republic	0.01

	Activity 3.5 Publication of the decision on adoption by the Government in order to increase the feasibility of the project and attract foreign investment to the project	RB	Government of the Kyrgyz Republic	2025	Political	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Decree of the Government of the Kyrgyz Republic	0.002
Action 4. Pre-feasibility study assessment, project development and implementation	Activity 4.1 Feasibility Study Assessment	RB, MPR	City Hall	2024-2026	Political.	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Feasibility study	0.2
	Activity 4.2 Preparation of tender packages and organization of tenders for the implementation of the project.	RB, MPR	Ministry of Environment. Climate Finance Center	2025-2026	Political.	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Providing permission to conduct financial transactions on the project. Application to the Climate Fund	0.01
	Activity 4.3 Implementation of projects by the winning bidder	MPR	Ministry of Environment. Climate Finance Center	2025-2027	Political.	Obligations to fulfill NDCs represented by the Government of the Kyrgyz Republic	Providing permits to conduct financial transactions on the project. Application to the Climate Fund	1.0

2.2. Project ideas for the Waste sector

2.2.2. Summary of project ideas for the Waste sector

The project idea represents a specific action that supports the implementation of the overall goal specified in the Technology Action Plans (TAPs) for the Waste sector and relates to the following technology: “Mechanical-biological treatment of solid waste”.

Introduction: Project idea: “Monitoring changes in morphological composition, studying accumulation rates and density of solid waste in Bishkek.” The morphological composition characterizes the ratio of individual components of solid production and consumption waste (homogeneous groups of waste), expressed inpercentage of the total mass.

Goals: This project will be able to provide support in obtaining information on the morphological composition of waste by season, density and accumulation rates.

Results: The result of this project is quantitative information on the morphological composition of waste by season, density and accumulation rates.

Project results: Obtaining this information will ensure effective planning and management of waste management, determining the actual content of useful components suitable for recycling. Information on the morphological composition of waste by season, density and accumulation rates is necessary when analyzing solid waste for a more accurate assessment of the volumes of waste removed and/or to be processed. Also, the results obtained can be used to solve practical applied problems:

- updating of territorial schemes (TSOO);
- development of sectoral and regional planning documents,
- building financial models and business plans for the implementation of projects in the field of waste management,
- to determine the capacity needs of waste treatment and disposal facilities,
- development of projects for the construction and modernization of waste sorting complexes and waste processing plants.

Project scope: Research on the morphological composition of waste by season, density and accumulation rates will be carried out on the territory of Bishkek and residential areas adjacent to the city. The last study of the morphological composition of Bishkek was carried out in 2012 as part of the project “Improving the municipal solid waste management system”

Project activities: Studying the morphological composition, density, accumulation standards, recording the results, preparing a report on the results, holding working meetings with stakeholders to present and discuss the results.

Dates: Considering the need to study the morphological composition of solid waste by season, the duration of the study is 1 year, registration of the results and preparation of the report is 6 months. The total duration of the project is 1.5 years.

Budget/resource requirements: about 25 thousand $

Measurement/Evaluation: Quantitative indicators of morphological composition by season in percentage, density kg/m3, rate of solid waste accumulation per person/year.

Possible complications/problems: Difficulties may arise with allocating a site for waste sorting and hiring employees for sorting. Weak coordination between departments.

Responsibility and coordination:
City Hall: allocation of territory for a sorting site, coordination of actions,
MP "Tazalyk":
- organizing the collection of solid waste into containers and ensuring the safety of received waste, limiting access for persons engaged in unauthorized removal of useful fractions.
MP "Bishskek Sanitary Landfill":
- providing access to the territory of the sanitary landfill to study the morphological composition of incoming waste.

1.3. Cross-cutting issues

Technology sector Waste mainly falls into the category “Other non-market goods”. The introduction of technology involves fairly large projects: the software and organizational components of technology predominate. Typically, the transfer of such technologies is financed and carried out by parties involved in the development process, such as donors and government agencies. At the same time, the main obstacles to launching the projects under discussion are insufficient access to financing and the lack of feasibility studies. On the other hand, barriers to long-term and successful technology adoption are complex and multifaceted.

Barriers are mainly of an institutional and normative nature: they are determined by forms of ownership, changes in management systems, professionalism of the top management of these systems, etc.

The identified barriers in the field of waste management are interconnected to the extent that they are caused by the vagueness of strategic plans adopted by the state, the lack of relevant normative and regulatory acts and their implementation that is not legally enshrined. Thus, the actions are mainly aimed at removing these obstacles and implementing the proposed measures to create an enabling environment and enable technology transfer and dissemination in the waste management sector. Strengthening international cooperation to exchange experience and transfer technologies and attract climate investments is a common measure for all technologies.

Bibliography

1. UNEP DTU Partnership. 2017. Enhancing Implementation of Technology Needs. Guidance for Preparing a Technology Action Plan.
2. Prakriti Naswa, Subash Dhar, Sudhir Sharma. 2017. Evaluating measures for inclusion in a technology action plan. UNEP-DTU Partnership.
3. Nygaard, I. and Hansen, U. (2015). Overcoming Barriers to the Transfer and Diffusion of Climate Technologies: Second edition. UNEP DTU Partnership, Copenhagen.
4. NSC. 2023 Yearbook. Kyrgyzstan in numbers.
5. Climate Risk Profile: Kyrgyz Republic (2021): World Bank Group and Asian Development Bank.
6. *IUCN*(2020). Global Standard for Nature-based Solutions. A user-friendly framework for the verification, design and scaling up of NbS. First edition.

Appendix I. List of stakeholders involved and their contacts

List of working group, Waste sector

No.	Full name	Organization, position	Contacts
1.	Ulanbekov Talantbek Ulanbekovich	Bishkek City Hall, head of the OBO department	0505002007 ulanbekovtalantbek@gmail.com
2.	Dzhumaliev Nurlan Japarbekovich	Director of the Bishkek Sanitary Landfill	0559233233 mp_bsp@mail.ru
3.	Maatkulov Abas Atantaevich	Deputy Director for Planning and Development of Small Enterprises at the Tazalyk Enterprise	0312 345-102, (reception) 0312 345-073, (general department) 0555080810 mptazalyk@mail.ru abas1609@mail.ru
4.	Karimov Alibek Abdyganievich	Specialist of the development and monitoring department of housing and communal services of Gosstroy	0312 312-924 Common department ali.k.7189@mail.ru
5.	Orozbakieva Shayirgul Galievna	Leading specialist of the department for the development of drinking water supply and sanitation at the State Agency for Architecture of Construction and Housing and Communal Services	0312 312-924 Common department orozbakieva@mail.ru
6.	Jumanalieva Ainura Satybekovna	Center for Climate Finance under the Ministry of Natural Resources, Ecology and Technical Supervision of the Kyrgyz Republic	555 56 20 00 ainuradjm@gmail.com adjumanaliyeva@gmail.com
7.	Moldokulov Kurmanbek	Bishkek Development Agency, Director	0557-858888 kurmanbek78@gmail.com
8.	Kulmurzaeva Aisuluu Kuvatbekovna	Bishkek Development Agency	0505043044 aisuluukulmurzaeva@gmail.com
9.	Bakirov B.Zh.	Bishkek Development Agency	0999117709 Bakytbek.bakirov.76@mail.ru
10.	Sultambaev Medetbek Oroskulovich	ARIS Senior Monitoring and Evaluation Specialist	MSultanbaev@aris.kg, 30-17-78 ext. 197 0702803251
11.	Baydakova Natalya Sergeevna	CSR Central Asia Environmental safety expert	0700 204-734 wastenet.projects@gmail.com
12.	Vedeneva Tatyana	Center for RES and EE. The president	0312 533-766 0555 755306 info@creeed.net

No.	Full name	Organization, position	Contacts
13.	Abduldaev Maksat Sekenovich	Institute of Water Problems Hydropower NAS KR. Head of Hydropower Laboratory	abduldaev59@mail.ru 0550056442
14.	Podrezov Andrey Olegovich	KRSU, Head of the Department of Meteorology, Climatology and Environmental Protection	0550 428-379 andrey_podrezov@mail.ru
15.	Obozov Alaybek Zhumabekovich	NAS KR, Laboratory of RES, Doctor of Technical Sciences, Professor	0559 190 606 obozov-a@mail.ru