



MINISTRY OF FOREIGN AFFAIRS
OF DENMARK



COWI

Assistance to the Development of the **Mykolaiv** **Masterplan**

Municipal Waste Management

Roadmap - Moving towards the Vision 2050

Final

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List of Abbreviations

CDW	Construction and demolition waste
IoT	Internet of things
IP	Investment package
EPR	Extended producer responsibility
EU	European Union
MBT	Mechanical biological treatment
MCA	Mykolaiv City Administration
MOA	Mykolaiv Oblast Administration
MFA	Ministry of Foreign Affairs
MW	Municipal waste
MWM	Municipal waste management
PIP	Priority Investment Programme
SB	Sounding Board
TBI	To be identified
WtE	Waste to Energy

1 Introduction

This report has been developed within the framework of the project “Mykolaiv - Denmark partnership – Technical support unit” financed by the Danish Ministry of Foreign Affairs (MFA). The project, which has been entrusted COWI, is a framework contract, which, among others, includes assistance to the Mykolaiv City Administration (MCA) in developing the Mykolaiv Masterplan in close cooperation with an Italian company, One Works.

Box 1-1 COWI's contribution to Mykolaiv Masterplan in a nutshell

Mykolaiv Masterplan, which has been requested by the Mayor of Mykolaiv City, has a time horizon till 2050. It provides a compass for actions to be taken by the Mykolaiv City to ensure that it will develop into a thriving city attractive to its citizens and business community.

In 2023 and 2024, COWI and One Works assisted Mykolaiv City Administration in developing the masterplan. In this work, COWI focused on three sectors:

- Water and wastewater
- Energy, including power, district heating and renewable energy sources
- Solid waste management.

Mykolaiv City Administration met weekly with COWI and One Works to ensure proper coordination.

COWI established a project organization consisting of a project management team and three sector teams of professionals, each headed by a Discipline Leader. Three sectoral Focal Points were responsible for monitoring cross-cutting activities, ensuring coordination between the parties and maintaining consistency in the deliverables.

To enhance transparency in the development of the Mykolaiv Masterplan, given its significant public interest and exposure, COWI established three sector-specific Sounding Boards inviting all potentially interested parties to take part in these.

It builds upon the results of the work carried out by the waste management team of COWI, in close cooperation with the MCA and coordinated with the Italian company One Works.

The work resulted in the four reports in addition to the current report, including the Priority Investment Programme, Waste, namely:

- Vision 2050
- Existing Situation Report
- Institutional Report
- Demolition Waste Report.

The Vision 2050 outlines the 2050 sector targets for municipal waste management (MWM) in Mykolaiv City. This vision has been discussed with all relevant stakeholders and approved by the MCA.

The findings outlined in the three other reports (Existing Situation Report, Institutional Report and Demolition Waste Report) describe and analyse the existing situation within MWM in the city and puts forward a few recommendations on the regulatory framework, demolition waste and others.

The current report outlines the steps required for the city, its residents, leaders, and industry professionals to meet the 2050 sector targets for MWM - taking into due account the existing situation. That is, it addresses the question: How to move from existing situation to the Vision 2050?

The principal audience for this report comprises the MCA, given its central role in the realization of the steps suggested in the roadmap. Following COWI's approach to visibility and transparency in supporting the process of rebuilding a better and greener Ukraine, this report, along with all others, has been made public available.

The report includes five chapters in addition to the current introduction, namely:

- **Chapter 2** presenting the Vision 2050 for MWM in the city of Mykolaiv and agreed with the MCA.
- **Chapter 3** briefly introducing the main conclusions of the assessment of the existing situation related to the status of the MWM in Mykolaiv, including legal, regulatory and institutional challenges, presently applied MW treatment system and the available infrastructure.
- **Chapter 4** outlining the basis for moving forward towards the sector targets laid down in Vision 2050. It presents the improvements in legal¹ and regulatory framework to be made, the main principles of public engagement and transparency that should be applied, as well as the projected affordability frames and funding opportunities.
- **Chapter 5** giving an overview of the Priority Investment Program (PIP) suggested for the development of the MW sector in Mykolaiv. The PIP is broken down by investment projects and enabling projects, as well as by short-term, mid-term and long-term projects. It also suggests grouping the projects included to the PIP into four Investment Packages, each consisting of a number of projects sharing a common objective and very much interlinked.
- **Chapter 6** providing an Action Plan listing specific activities related to each project and/or package, introducing responsible institutions and individuals that will be appointed for implementation of each task.

Box 1-2 Three cross-cutting reports

Three so-called cross-cutting reports have been prepared by COWI in connection with its contribution to the development of the Mykolaiv Masterplan. They are cross-cutting in the sense that they address issues of relevance for more than one of the three sectors (water, energy and waste). They are:

- Water and District Heating Affordability
- Financing Options for Municipal Infrastructure
- Impacts of Climate Changes.

¹ Please note that the legislative and regulative landscape in the field of waste management in Ukraine has undergone some changes since the Institutional Report was issued in January 2024. The changes are reflected in this report.

2 Vision for Solid Waste Management

As a result of thorough considerations and discussions between the experts and MCA, a consensus has been reached that articulates a vision reaching up to the year 2050. This vision integrates both short- and mid-term objectives for municipal waste (MW) management in Mykolaiv. The city looks to the future and bases its vision on global best practices, including EC Directives such as the Waste Framework Directive (2008/98/EC) and the Landfill Directive (1999/31/EC). Additionally, the vision adopts a circular economy approach, prioritizes environmental sustainability, and considers the needs of the city's residents.

In 2050, Mykolaiv is a clean, sustainable, and environmentally responsible city with a strong culture of modern solid waste management practices including waste reduction and recycling, advanced technologies and infrastructures that minimize waste generation and maximize resource utilization with an active community participation.

Figure 2-1 provides an overview of core elements of the Vision 2050.

Figure 2-1 Core elements of the Vision 2050

<p>Regulative basis</p> <p>a) Waste Framework Directive (2008/98/EC) integrate the principles and goals of a circular economy:</p> <ul style="list-style-type: none"> • by establishing the hierarchy of waste management • sets targets for waste reduction, recycling and promoting recycling practices. <p>b) Landfill Directive (1999/31/EC)</p> <ul style="list-style-type: none"> • Promote waste minimization • which has the goal to reduce environmental impact of landfill operation 	<p>Circular economy</p> <ul style="list-style-type: none"> • Optimized waste separation and collection system with transportation and transfer stations using smart solution and IoT • Network of modern waste sorting and recycling facilities and/or composting plants, MBT, ensuring that waste is processed in the most environmentally friendly manner • Recyclable materials will undergo specialized recycling processes and non-recyclable waste will undergo preliminary treatment • Remaining will be directed to a modern sanitary landfill.
<p>Community engagement</p> <ul style="list-style-type: none"> • Vision relies on effective collaboration with various stakeholders. • Strong cooperation with the community, the municipality, local businesses, NGOs, and waste management companies. • Joint efforts are made to explore innovative waste reduction strategies, develop recycling partnerships and sustainable waste management practices. • Effective public awareness and education campaign are implemented 	<p>Sound economy</p> <ul style="list-style-type: none"> • Cost-effective waste management system for the municipality specially by minimizing volumes of waste to be disposed of • Mykolaiv's local economies is invigorated by generating new business opportunities. • Rethinking production processes and product design leads to development of innovation and entrepreneurship -> This creates jobs in areas such as recycling, repair, remanufacturing, and eco-design

In addition to that, Vision-2050 envisions cross-cutting integration with the energy sector and suggests the possibility of integrating Waste-to-Energy and Renewable Energy, based on the existing potential of waste-to-energy technologies. Furthermore, it considers opportunities for the integration of renewable energy sources, such as solar or wind, into the waste management infrastructure.

Finally, Vision-2050 suggests that the amount of demolition waste has returned to pre-war conditions, and the required infrastructure that was established for short- and medium-term processing of demolition waste has transitioned to a different business model.

3 Summary of existing situation

Achieving the targets outlined in Vision-2050 will involve a challenging process of transitioning from the current situation to the envisioned state by 2050. This chapter presents the most important findings of the project, providing a description of the baseline situation in solid waste management in Mykolaiv. It offers a brief overview of the existing regulatory, legal and institutional challenges faced by the city, as well as the less than perfect technical conditions of the MW treatment infrastructure.

Additionally, the chapter describes the sector's economy, which is currently subsidized by the city budget and relies on the tariff system. The achievement of the targets set for 2050 will therefore only be viable if the suggested service level of municipal services remains affordable for the population.

3.1 Legal and regulatory challenges of Mykolaiv city

Being a candidate country for the EU membership, Ukrainian legislation experiencing serious changes of the legal framework. Transfer from the main law regulating basic principles of waste management since 1998, to EU legal requirements on waste management poses various challenges.

The adoption of the new Law of Ukraine "On Waste Management" in June 2022 is a significant and crucial development in the waste management sector. This law is instrumental in supporting the implementation of the Association Agreement and the provisions outlined in Directive 2008/98/EC. However, despite the official enforcement of the law on July 9, 2023, the full implementation is hindered by the dependency on sub-regulations related to the law from 1998. Furthermore, the lack of development of all necessary secondary legislation for the new law further complicates the implementation process. Comprehensive work on sub legislation development has been done at the second half of 2023 - beginning 2024 but some sub laws are still missing.

One of the evident challenges is faced in Mykolaiv city, where progress towards implementing the vision relies on the presence of the MW management plan (MWMP), which should be in alignment with the regional waste management plan (RWMP). To maintain consistency, the municipal planning process can only begin once the regional plan is established. The new law allows for one year of preparation for each document. As of July 2023, no RWMP has been adopted for Mykolaiv oblast, and this delay adds further complexity to the implementation process in the city.

More details on the legal challenges experienced in the waste management sector in Mykolaiv, as well as possible solutions suggested by the consultant, are provided in the Institutional Report.

3.2 Institutional challenges

The Law of Ukraine "On Waste Management" introduced changes to the current system of managing MW. These changes involve transferring the authority to issue permits for waste treatment operations to the central level and establishing for the municipalities with population more than 500,000 people a new administrative unit responsible for MW management services (administrator). Despite these modifications, the fundamental structure of the system remains unchanged, as the central executive body continues to shape state policy on MW management and implement it at the local level through regional and municipal/city councils and their executive bodies.

The Department of Sustainable Development of the City and the Department of Housing and Communal Economy of the Mykolaiv City Council serve as the executive body responsible for MW management in MCA. The Department of Utility Development is responsible for organizing the provision of MW management services in the city. Other departments, such as the Department of Economic Development and the Unit for Management of Communal Property, have their own responsibilities and powers concerning the economy, utilities, and other aspects of MW management.

Major part of MW collection services in the city are provided by two utility companies that were selected as winners of the competition for MW collection and transportation services. Additionally, there are a few smaller service providers that work directly with condominiums and the commercial sector.

The overview of the main Institutions involved in MW management in Mykolaiv City and their relations are presented in the Existing Situation Report and Institutional Report.

One of the new Law "On Waste Management" fundamental requirements is consistent planning for MW management at the regional and municipal levels. This entails finalising the regional planning before initiating municipal planning. Consequently, the major institutional challenge faced by the MCA is the lack of coordination with the regional authorities (MOA) that hampers the alignment and synchronization of waste management planning efforts between the regional and municipal levels.

Overall picture summarizing strengths, weaknesses, opportunities and threats of the MW management in Mykolaiv is presented in the SWOT analysis included in the Institutional Report.

3.3 Waste management system in Mykolaiv

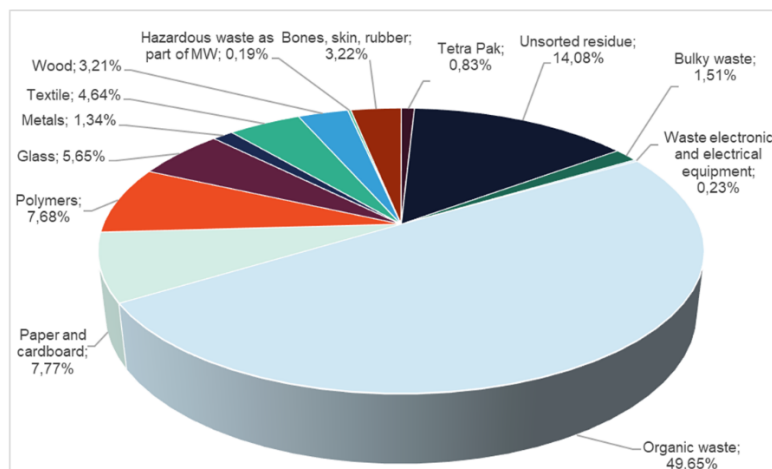
This chapter briefly outline the status and challenges of the waste management in the city of Mykolaiv, providing an overview of the project's findings related:

- MW generation, composition, recycling potential and applied sorting and collection practices
- Existing MW treatment infrastructure.

3.3.1 MW generation, composition, recycling potential and applied sorting and collection practices

The Figure 3-1 overleaf provides the update on the basic data related to the MW generation and composition in the city of Mykolaiv.

Figure 3-1 Basic data on MW generation and composition

Basic data:**Population: 469,545 persons (01.02.2022)****MW generation: 144,800t (919,800 m³)****Population coverage by MW collection service: 63%****MW landfilling: 99,9%****MW composition****3.3.2 Recycling potential and applied sorting and collection practices**

There is a recycling potential for traditional components like paper and cardboard, metals, glass, wood, and plastics, which was around 25-26% in 2023. Additionally, organic waste, accounting for nearly half of the MW generated in the city, has the potential for recycling, producing compost that can be further reused. However, the realization of this potential depends on the introduction and efficient operation of a separate collection system for organic waste.

To effectively utilize the recycling potential of MW, it is crucial that extended producer responsibility (EPR) is not only introduced in the legislation but also enforced and successfully implemented.

Two major service providers, namely UC "Obriy-DKP" and UC "Mykolaivcomuntrans," provided waste collection and transportation services to approximately 63% of the citizens of Mykolaiv in 2022. An additional 20% of the population is served by several smaller providers of MW collection services. All waste collected by these service providers is brought to the Landfill for MW in Mykolaiv City.

Separate waste collection in Mykolaiv is still in its initial stage. It has been implemented in some healthcare and educational institutions, as well as in a few areas with multistorey buildings. In 2023, only one vehicle was used for collecting sorted MW.

3.4 Waste treatment infrastructure

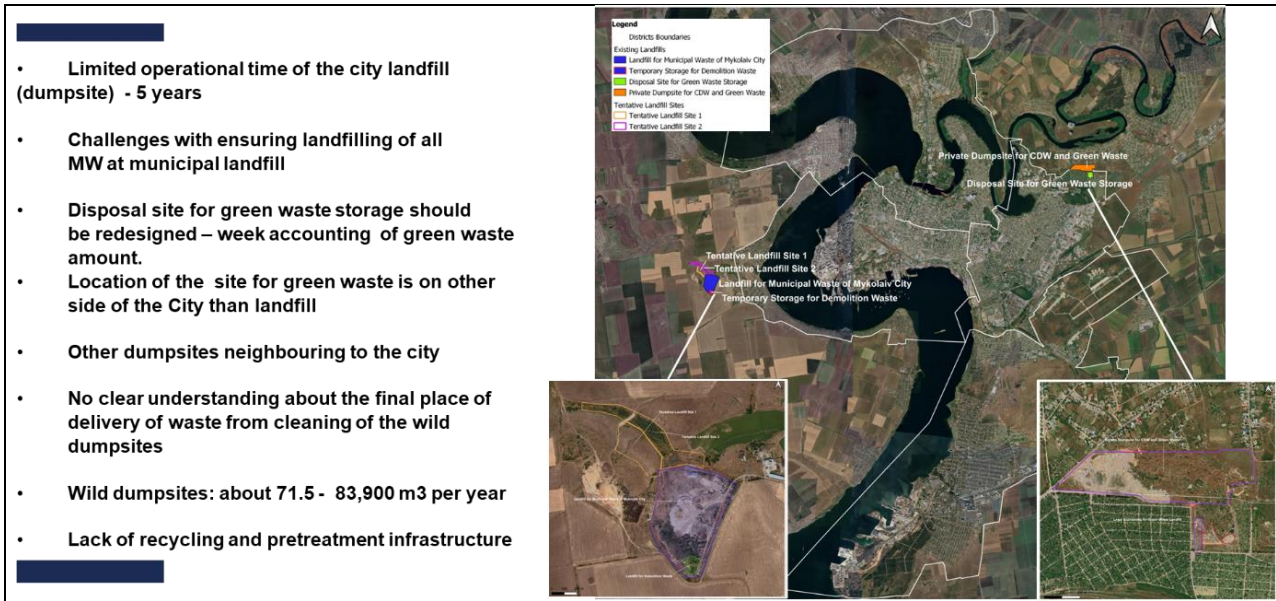
Multiple locations in Mykolaiv are designated to receive waste from its citizens. These include:

- Landfill for MW of Mykolaiv City
- Disposal site for green waste storage
- Private dumpsite for CDW and green waste

In addition to these designated locations, there are several unauthorized dumpsites scattered throughout the area. These dumpsites are cleared by the city authorities each year, only to reappear in different locations.

Figure 3-2 presents the overview of existing in Mykolaiv city landfills and list the biggest challenges related to MW treatment infrastructure.

Figure 3-2 Map of existing landfills and main challenges of the WM treatment infrastructure



4 Basis for moving forward

This chapter lays down the basis for the implementation of the masterplan that will require significant efforts to lead Mykolaiv's MW management from the existing situation to the future of the sector, as described in the Vision 2050 for the MW sector. The following three subchapters briefly describe this basis, focusing on the legal and regulatory framework (Chapter 4.1), principles of public engagement and transparency (Chapter 4.2), and financial capacity, including the potential for mobilizing capital investments on one hand and ensuring the financial capacity to operate the assets in the future on the other hand (Chapter 4.3).

4.1 Legal and regulatory requirements

As a candidate country for EU accession, Ukraine would need to align its legislation with the EU *acquis Communautaire* which means that the development of the Mykolaiv Master plan shall be performed in compliance with the EU directives which constitutes an important guiding principle for the implementation of the masterplan.

Together with the national legislation of Ukraine, the following key EU directives related to solid waste will, among others, serve as the basis for the roadmap:

- Waste Framework Directive (Directive 2008/98/EC), providing the basic concepts and principles for waste management, including waste prevention, recycling, and safe disposal
- Landfill Directive (Directive 1999/31/EC), setting out requirements for the landfilling of waste, including technical specifications for landfill design, operation, and closure, aiming to reduce environmental and health risks
- Packaging and Packaging Waste Directive (Directive 94/62/EC) focusing on the reduction of the environmental impact of packaging and promotes recycling and waste prevention measures for packaging waste
- Industrial Emissions Directive (Directive 2010/75/EU) aiming at prevention or reduction of emissions from industrial facilities, including waste treatment plants, to protect the environment and human health.

In 2014, Ukraine signed the Association Agreement with the EU and undertook number of obligations on implementation of the Directives related to waste management. Furthermore, a new "Law of Ukraine "On Waste Management" was adopted to implement the Association Agreement and to transpose the provisions of Directive 2008/98/EC. The Law entered into force on July 9, 2023.

This law and related secondary legislative documents that are currently being developed together with the basic EU directives constitute the legal background for implementation of the Masterplan for Mykolaiv in the sector of MW management.

4.2 Engagement and transparency

To enhance transparency in the development of the Mykolaiv Masterplan, given its significant public interest and exposure, COWI and MCA have established a sector-specific Sounding Board on waste, inviting all potentially interested parties, including national and international institutions, organizations, companies, and experts to take part in the process. All decisions made during the

development of the masterplan have been openly discussed with the members of the Sounding Board and all documents prepared thus far have been made publicly available.

To ensure a transparent, inclusive, democratic, and socially responsible approach to the implementation of the masterplan, the forthcoming process will continue to be based on the principles of transparency, public engagement and participation. These principles will remain the cornerstone and the fundamental basis for future progress towards the targets set in the Vision 2050 for the MW management in Mykolaiv.

4.3 Affordability

Affordability for MW services in Mykolaiv was calculated for two scenarios:

- › Scenario 1: Sorting + composting + MBT for mixed waste + landfilling
- › Scenario 2: Sorting + composting + WtE for mixed waste +landfilling

Calculation was based on the following data:

- macroeconomic data forecast for Ukraine from 2022-2032²
- household income and expenditure data in Mykolaiv for each of 10 income deciles in UAH for 2018-2021 (estimated by COWI)
- average household size in Mykolaiv for 2018-2022³
- Ukrainian tariffs MW waste service in UAH/m³ for 2018-2023
- Waste generation in Mykolaiv in kg per capita per day (calculated based on developed forecast for MW generation till 2032)
- Ukrainian VAT rates⁴ for MW⁵ service tariffs.

Conclusions of the affordability analysis are outline in the Table 4-1 shows average weighted tariffs on MW management service and affordability 2030 – 2032.

Table 4-1 Average weighted tariffs on MW management service and affordability 2030 - 2032

	2030	2031	2032
Generation of MW, t/person/year	0.313	0.314	0.315
Generation of MW, t/household/year*	0.793	0.794	0.796
Average revenue per household, UAH/ household/ month	29,877.0	33,253.0	37,010.0
Scenario #1 Sorting + composting + MBT for mixed waste (RDF/SRF production + biostabilisation) + landfilling **			
Average weighted MW management service tariff (Excluding VAT), UAH/t	6,195.62	7,063.00	8,051.82
Average weighted MW management service tariff (Including VAT), UAH/t	7,434.74	8,475.60	9,662.19

² EBRD

³ Mykolaiv City Administration

⁴ Ministry of Regional Development, Construction, Housing and Communal Services of Ukraine

⁵ Mykolaiv City Administration

Payment for MW management service (Including VAT), UAH/household/ month	491	561	641
% form average income	1.6%	1.7%	1.7%
Scenario #2 Sorting + composting + WtE for mixed waste + landfilling **			
Average weighted MW management service tariff (Excluding VAT), UAH/t	8,477.69	9,664.56	11,017.60
Average weighted MW management service tariff (Including VAT), UAH/t	13,221.12	13,221.12	13,221.12
Payment for MW management service (Including VAT), UAH/household/ month	672	768	877
% form average income	2.2%	2.3%	2.4%

* There is 2.53 persons per 1 household

** MW collection service and CAPEX recovery for new vehicles is included

4.4 Funding opportunities

This chapter presents short summary of observation of funding provided to the waste management sector by various IFIs, donors and other funding agencies in Ukraine previously. Following potential institutions have supported projects targeting waste management sector in Ukraine:

According to existing experience in Ukraine projects related to the landfill construction or waste treatment facilities were funded by loans and/or credits. Following funding agencies might be considered and could be approached with request for funding: EBRD, EIB, WB, AFD, KfW, JICA, NEFCO.

Various IFI may be interested in providing non-sovereign loans (directly to the municipality or to a public company, or through an intermediary financial institution) or involved in a blended financial scheme. Often, loans provided by these organisations could be supplemented with grant funding for up to 5 million EUR (depends on the IFIs and/or the Project). It is important to be aware of that all loans should be recovered through the tariffs on MW management and must still be affordable for the population.

From 2023 EU funding through so-called LIFE⁶ program became available for Ukrainian Municipalities. Unfortunately, very limited number of projects got financing so far due to limited budget and tough competition. LIFE Program provides financial inputs supporting projects for municipalities, requiring however co-financing from applicants. Another EU financial support program is Interreg Europe where Ukraine is considered as eligible for application country⁷

Following financial institutions may be involved in financing of *Enabling Projects*: GIZ, USAID, SIDA, SECO, UNDP, Swedish Government, Danish Ministry of Environment or MFA support programs. Funding from Royal Norwegian Embassy, Netherlands Embassy might be provided in the long-term perspective.

⁶ [AGENCE EUROPE - European Commission launches LIFE call for projects... \(agenceurope.eu\)](https://ec.europa.eu/interreg/en/interreg-europe)

⁷ <https://www.interregeurope.eu/next-call-for-projects>

5 Priority Investment Programme, Waste

This chapter introduces the Priority Investment Programme (PIP) for the MW management sector. Reference is made to 6Annex 1, which provides the PIP in extenso.

In the subsequent section of this chapter, two matters are addressed. Section 5.1 provides an overview of the PIP in question in terms of a timetable, whereas Section 5.2 puts forward a few investment packages (IPs), each of which is aimed at achieving a common objective and may be presented to possible investors, such as IFIs and donors, for a blended finance arrangement.

5.1 PIP, Timeline

The Table 5-1 below lists all short-, mid- and long-term investment and enabling projects that have been included to the PIP on waste. The projects are listed in the order of priority.

Table 5-1 PIP overview

CODE	PROJECT NAME	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036-2040	2041-2045	2046-2050	CAPEX*
INVESTMENT PROJECTS																	
STIP	Development of a new sanitary landfill																Capex: ~30-35 mln EUR (capacity of 180,000 tpa, 30 Ha)
MTIP	Closure of existing landfill																~ 30 mln EUR (800.000 Eur/ha, ca.38 ha)
STIP	Demolition and clean-up																Capex: ~500.000-800.000 EUR (project preparation); 20-50 MEUR project implementation (depending on ~400.000 - 650.000 EUR (project preparation)
STIP	Construction and demolition waste facility for emergency clean-up																Equipment: 1.350.000 to 2.000.000 EUR ~ 2 mln EUR (further details in the descriptopn of STIP 5)
STIP	Waste separation, collection and transportation in a pilot district																
MTIP	Improvement of MW collection and transportation system in Mykolaiv civt																~7-10 mln EUR (further details in MTIP 6)
STIP	Construction of the sorting line for the recyclables																~250,000 EUR, capacity 10,000 t/year with a possibly for extension with two more lines. OPEX 25 EUR/t
MTIP	Construction of MBT facility with RDF production and biostabilisation																Capex: ~35 mln EUR (capacity 95,000 – 100,000 tpa) Opex: 40 EUR/t
MTIP	Construction of composting plant for separately collected biodegradable and green waste																Capex: ~1.5 mln EUR for 38,000 tpa Opex: 35-40 EUR/t
ENABLING PROJECTS																	
STEP	Support to development Municipal Waste Management Plan for Mykolaiv																Time based. Estimated 60-100.000 EUR
STEP	Improvement of regulatory environment to support efficient handling of demolition waste																Time based. Estimated 60-100.000 EUR
LTEP	Enhancing capacity and fostering public awareness on MW management																Time based. Estimated 50-100.000 EUR, excluding direct costs related to capacity development (travel, ...)
MTEP	Implementation of the EU Waste Acquis at municipal level																TBD

Legend:
 Project preparation period
 STIP expected duration
 MTIP expected duration
 MTIP ad-hoc assistance
 STEP/LTEP expected duration
 STEP/MTEP/LTEP follow-on implementation

Detailed description of suggested investment and enabling projects is included in the PIP, where all projects are presented in the templates that have been discussed and adjusted to reflect suggested comments received from, among others, EBRD, NEFCO, EIB and Danish MFA.

Grouping the projects into Investment Packages (IPs) is presented in the Chapter 5.2.

5.2 Investment Packages (IPs)

The projects included in the PIP on waste address various challenges experienced by the MW sector in Mykolaiv. Grouping the projects that are united by common objectives into IP will make it more feasible to mobilize various IFIs and donors that work with specific aspects of the waste management sector.

The Table 5-2 Investment packages (IPs), Overview presents four IPs, specifying their objectives and referring to the number of projects from the PIP on waste that are targeting each specific objective. Each IP besides investment projects includes also enabling projects that will have to be carried out

to ensure effect of the investments. Enabling project proposing support for development of MWMP is highly relevant both to IP 1 and IP3 and is therefore included in both IPs. Other enabling projects support specific IPs.

Table 5-2 Investment packages (IPs), Overview

No	Title	Objective	Investment projects included	CAPEX, Total, EUR
1	Landfill	To ensure by the year of 2030 a successful transfer from the existing landfill, which has a limited remaining lifetime and poses several environmental challenges, to the new landfill that provides sufficient capacity for the safe disposal of residual municipal solid waste	STIP 1, MTIP 2 & STEP 1	60-65 Mln. EUR
2	Demolition waste	To reduce the environmental impact from the demolition and clean-up of damaged buildings and establish infrastructure for the recycling of demolition waste.	STIP 3, STIP 4 & STEP 2	20-50 Mln. EUR
3	MW recycling	To implement a waste management hierarchy approach in Mykolaiv through the development and executing of an effective system for waste separation, collection, and transportation	STIP 5, MTIP 6, STIP 7, STEP 1, LTEP 3	10-12 Mln EUR
4	MW treatment	To implement the most feasible model for the treatment of MW	MTIP 8, MTIP 9	35-38 Mln EUR

6 Action Plan

This chapter address the issue of implementation of the steps indicated in the roadmap thus contributing to achievement of the Vision 2050 for MW management in Mykolaiv. Suggested roadmap foresee implementation of four IPs and the Table 6-1 Actions, responsible authority and contacts to authorised person for specific IPs below presents an Action Plan that includes an overview of duties and responsibilities related to preparation and implementation of each specific IP.

The Action Plan presented below in the Table 6-1 has been developed in close cooperation with the Municipal Service Department of MCA and forms the foundation for project database. This database initially consisting of the projects and investment packages proposed by COWI in the MW PIP. However, in the future, it will also accommodate other projects initiated, considered or implemented by MCA. The database may be made publicly accessible on the city's website, thereby promoting transparency and facilitating the coordination of efforts among various IFIs and donors. This will help prevent overlapping activities and ensure effective collaboration.

Table 6-1 Actions, responsible authority and contacts to authorised person for specific IPs

Nr.	Package Nr.	Project Title	Priority	Expected duration	Estimated CAPEX/Euro	Key tasks (from PIP)	Status	Available documentation (link to MCA's server)	IFI potentially interested in the project	Responsible authority	Contact person
1	1	Development of a new sanitary Landfill	1	72 months	30.000.000 - 35.000.000	<ul style="list-style-type: none"> • Site Selection and land plot allocation • Define the landfill in regional waste management plan and municipal waste management Plan • Feasibility Study • Environmental Impact Assessment (EIA) • Design and Engineering Plans • Permitting and Regulatory Approvals • Earth works and construction. • Monitoring and Control Systems • Operational Guidelines • Training and Capacity Building 	Urgent need for selection of the site and landplot allocation, EIA and formal site allocation. This ensures that the new landfill site is operational prior to the closure of the current landfill.	NA	TBI	MCA, Department of Municipal Services Cooperation with the Oblast Administration is required	Krysina Iryna +380989678656 Head of the Operation Support Department of Housing and Communal Services of Mykolaiv City Council
2	1	Closure of existing landfill	1	96 months	30.000.000	<ul style="list-style-type: none"> • Environmental Impact Assessment (EIA) • Design and Engineering Plans (design documentation of the landfill reconstruction) • Permitting and Regulatory Approvals • Earth works and closure. • Maintenance of the integrity and effectiveness of the final cover • Operation of the leachate collection system and gas collection system • Monitoring and Control Systems (groundwater monitoring and Gas migration monitoring) 	Existing landfill's lifetime was prolonged till the end of 2025. Urgent need to commencing activities that will allow responsible closure of existing landfill.		JICA supplied some equipment that could be used on the existing landfill	MCA, Department of Municipal Services	Krysina Iryna +380989678656 Head of the Operation Support Department of Housing and Communal Services of Mykolaiv City Council

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3	2	Demolition and clean-up	1	Preparation: 12 months Implementation: 24 months - 36 months	Preparation: 500.000 - 800.000 Implementation: 20.000.000 - 50.000.000	Preparation: • Damage assessment and prioritization of buildings (tasks related to the damage assessments are foreseen to be conducted by the municipality administration supported by specialists and legal advisors as required) • Development of tender documents • Tendering • Contracting • Project follow-up Implementation: • Demolition and clean-up work • Transportation of the DW to the allocated area	Ongoing small scale Further support is required, especially in relation to legal/ownership issues and development of responsible demolishing practices	• Damage assessments carried out by OneWorks and COWI in the frame of preparation of Mykolaiv Masterplan • Macro-economic waste study for the reconstruction of the Mykolaiv region, Neo-Eco & Mission East, October 2023 • 70 rural settlements in Mykolaiv, Debris volumes, costs and potential, Neo-Eco. Damage UA & Mission East, June 2023	Mission East supported Neo Eco for DW treatment in Mykolaiv Oblast	MCA, Department of Municipal Services Cooperation with the Oblast Administration is required	Krysina Iryna +380989678656 Head of the Operation Support Department of Housing and Communal Services of Mykolaiv City Council
4	2	Construction and demolition waste facility for emergency clean-up	1	Preparation: 12 months Implementation: 36 months - 48 months	Preparation: 400.000 - 650.000 Implementation: 1.350.000 - 2.000.000	Preparation: • Feasibility study (including estimation of CAPEX, OPEX, market analysis, institutional setup, etc.) • Define the CDW facility in Regional waste management plan and municipal waste management Plan • Localisation of CDW Facility • Development of Tender Documents for provision of machinery and equipment • Procurement • Contracting • Project follow-up Implementation and Operation: • Provision of equipment and machinery • Setting up a CDW facility • Crushing and sorting at CDW facility • Promotion and sale of recyclables	Project preparation is ongoing	• Background note, social infrastructure - Strategic framework for Danish assistance to rebuilding Ukraine, COWI, April 2023 • Assistance to the Development of the Mykolaiv Masterplan - Construction and Demolition Waste Report, COWI, November 2023 • Macro-economic waste study for the reconstruction of the Mykolaiv region, Neo-Eco & Mission East, October 2023 • 70 rural settlements in Mykolaiv, Debris volumes, costs and potential, Neo-Eco. Damage UA & Mission East, June 2023	JICA supplied DW treatment equipment, sufficient for implementation of the tasks described by COWI Neo Eco will rent DW treatment equipment from August 2024 and start treatment of DW in Shevchenkivsky (Mykolaiv Oblast)	MCA, Department of Municipal Services Cooperation with the Oblast Administration is required	Krysina Iryna +380989678656 Head of the Operation Support Department of Housing and Communal Services of Mykolaiv City Council

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5	3	Waste separation, collection and transportation in a pilot district	2	60 months	2.000.000	<ul style="list-style-type: none"> • Design of various optional setups for waste separation, collection and transportation • Procurement and installation of containers • Establishment of containers sites • Design and construction of a drop-off centre • Procurement of vehicles for waste collection • Evaluation of the results and reporting 	NA	<ul style="list-style-type: none"> • The scheme of the sanitary cleaning of the city approved by the MCA (indicating, among others, number of defined containers and vehicles could serve as the basis for further consideration) 	TBI	MCA, Department of Municipal Services	Krysina Iryna +380989678656 Head of the Operation Support Department of Housing and Communal Services of Mykolaiv City Council
6	3	Improvement of MW collection and transportation system	2	96 months	7.000.000 - 10.000.000	<ul style="list-style-type: none"> • Assess the amount of assets requiring upgrading • Purchase necessary assets • Maintain workshops, container sites and drop-off centres 	NA	<ul style="list-style-type: none"> • The scheme of the sanitary cleaning of Mykolaiv city 	TBI	MCA, Department of Municipal Services	Krysina Iryna +380989678656 Head of the Operation Support Department of Housing and Communal Services of Mykolaiv City Council
7	3	Construction of sorting line for recyclables	3	60 months	250.000	<ul style="list-style-type: none"> • Develop Feasibility Study Define the sorting line in Regional waste management plan and municipal waste management Plan • Develop design documentation • Allocate a land plot • Conduct EIA • Obtain a permit • Provide construction works, buy and maintain sorting line equipment • Implement MW separate collection within the MTIP 6 “Improvement of MW collection and transportation system” 	MCA have ordered "Technical and Economic Feasibility Study for construction of MWT complex in Mykolaiv City " that is considering various technical options, providing a detailed cost comparison, and defining the facility's capacity. The FS is anticipated to be finalized by the end of March 2024	<ul style="list-style-type: none"> • ToR for "Technical and Economic Feasibility Study for construction of MWT complex in Mykolaiv City" • Feasibility Study for construction of MWT complex in Mykolaiv City 	TBI	MCA, Department of Municipal Services, Cooperation with the Oblast Administration is required	Krysina Iryna +380989678656 Head of the Operation Support Department of Housing and Communal Services of Mykolaiv City Council

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8	4	Construction of mechanical biological treatment facility (MBT) for mixed waste with RDF production and biostabilisation	3	84 months	35.000.000	<ul style="list-style-type: none"> Assess various waste treatment options Develop Feasibility Study for selected MBT options Define the waste treatment facility in Regional waste management plan and municipal waste management Plan Conduct negotiations with cement plant or another RDF user and define specification for RDF in case of MBT plant with RDF production Develop design documentation Allocate a land plot Proceed with EIA Obtain a permit Provide construction works, buy and maintain equipment 	The Mykolaiv City ordered implementation of "A technical and economic feasibility study for the object: New construction of MW treatment complex in Mykolaiv City" with the SE "Scientific-research and design-technological institute of urban economy". According to the ToR the FS will analyse different technical options for MW treatment facility and assess the costs of various options. The FS should be finalised in March 2024.	ToR for "A technical and economic feasibility study for the object: New construction of MW treatment complex in Mykolaiv City" Draft "A technical and economic feasibility study for the object: New construction of MW treatment complex in Mykolaiv City"	TBI	MCA, Department of Municipal Services, Cooperation with the Oblast Administration is required	Krysina Iryna +380989678656 Head of the Operation Support Department of Housing and Communal Services of Mykolaiv City Council
9	4	Construction of composting plant for separately collected biodegradable and green waste	4	72 months	1.500.000	<ul style="list-style-type: none"> To develop Feasibility Study Define the composting plant in regional waste management plan and municipal waste management Plan To develop design documentation To allocate a land plot To proceed with EIA To obtain a permit To provide construction works, buy and maintain equipment To implement separate collection of biodegradable waste 	MCA have ordered "Technical and Economic Feasibility Study for construction of MWT complex in Mykolaiv City " that is considering various technical options, providing a detailed cost comparison, and defining the facility's capacity. The FS is anticipated to be finalized by the end of March 2024 Within FS the Modeling of the Optimal Waste Management System in Mykolaiv is expected	<ul style="list-style-type: none"> ToR for "Technical and Economic Feasibility Study for construction of MWT complex in Mykolaiv City" Feasibility Study for construction of MWT complex in Mykolaiv City 	TBI	MCA, Department of Municipal Services, Cooperation with the Oblast Administration is required	Krysina Iryna +380989678656 Head of the Operation Support Department of Housing and Communal Services of Mykolaiv City Council

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10	1	Support to development Municipal Waste Management Plan (MWMP) for Mykolaiv	1	24 months	60.000 - 100.000	<ul style="list-style-type: none"> • Analysis of the basic situation • Supporting MCA in its participation in the development of RWMP • Establishment of a working group for development of the MWMP • Drafting MWMP, including key performance indicators • Submission for SEA and assistance in organising of public hearings • Incorporating of comments of SEA and views expressed in the process of public hearing 	N/A	NA	TBI	MCA, Department of Municipal Services Cooperation with the Oblast Administration is required	Krysina Iryna +380989678656 Head of the Operation Support Department of Housing and Communal Services of Mykolaiv City Council
11	2	Improvements of regulatory and administrative system for demolition and clean-up activities	1	Preparation: 12 months Development of new regulations and instruments: 12 months - 24 months	60.000 - 100.000	<ul style="list-style-type: none"> • Legal consultations • Drafting new regulations and development of administrative instruments • Workshops 	NA	NA	TBI	MCA, Department of Municipal Services	Krysina Iryna +380989678656 Head of the Operation Support Department of Housing and Communal Services of Mykolaiv City Council

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12	3	Enhancing capacity and fostering public awareness on MW management	1	84 months	50.000 - 100.000	<ul style="list-style-type: none"> • Baseline assessment and reporting, including targets definition of the recyclable ratio and reduction of MW landfilled • Targeted online training of the staff from municipality and service providers • Planning and implementation of the study tour to Denmark for key staff the city administration, municipal service providers, and NGOs • Promoting partnership between relevant organisations in Mykolaiv city and Danish organisations (https://cirkulaer.dk/, e.g. Ålborg or Odense Municipalities (TBD)) • Based on the experience from the study tour to establish a working group responsible for the design and implementation of a public awareness campaign 	NA	NA	TBI	MCA, Department of Municipal Services	Krysina Iryna +380989678656 Head of the Operation Support Department of Housing and Communal Services of Mykolaiv City Council
13		Implementation of the EU Waste Acquis at municipal level	2	108 months	TBD	<ul style="list-style-type: none"> • Development of Guide on EU Waste Acquis • Deep dive into the key directives within the EU Waste Acquis focusing on service levels and legal and regulatory framework • Development and execution of training program (preferably, modular training program) • Development of guide on data collection, processing and reporting, including templates, and ad-hoc assistance implementing this guide 	NA	NA	TBI	MCA, Department of Municipal Services Cooperation with the Oblast Administration and Central/National authorities is required	Krysina Iryna +380989678656 Head of the Operation Support Department of Housing and Communal Services of Mykolaiv City Council

Annex 1 Priority Investment Programme (PIP)

This annex is provided in a separate file.