MINISTRY OF FOREIGN AFFAIRS
OF DENMARK

Mykolaiv
city on the wave

Assistance to the Development of the Mykolaiv Masterplan

WSS
PIP - Annex to the Roadmap
Final

November, 2023

COWI

ADDRESS COWI A/S
Parallelvej 2
2800 Kongens Lyngby
Denmark

TEL +45 56 40 00 00
FAX +45 56 40 99 99
WWW cowi.com

Assistance to the Development of the Mykolaiv Masterplan

WSS
PIP - Annex to the Road Map
Final

Project No.	Document No.
A246262	D8_Annex to Road map_Water_F1

Version	Date Of Issue	Description	Prepared	Checked	Approved
2	November 2023	PIP, Water	VP, CIVY, TEKB, JKP, TAJ	TEKB	JKP

Contents

List of Abbreviations

DMAs	District Metered Areas
EC	European Commission
MCA	Mykolaiv City Administration
MFA	Ministry of Foreign Affairs
MVK	Mykolaiv Vodokanal (Water Utility)
NGO	Non-Governmental Organisation
NRW	Non-Revenue Water
SDGs	Sustainable Development Goals
WSS	Water Supply and Sanitation
WWTP	Wastewater treatment plant

1 Introduction

This annex provides the PIP for WSS prepared as part of the contribution of COWI to the Mykolaiv Masterplan. The PIP is broken down by investment projects and enabling projects, as well as by short-term, mid-term and long-term projects. priority investments broken down by short-term, mid-term and long-term investments. Box 1-1 below provides the definitions of the terms used.

Box 1-1 Definitions

A Priority Investment Programme (PIP) comprises several projects, categorized into investment projects and enabling projects. These projects vary in duration, with some being short-term, others mid-term, and yet others long-term.

Investment projects (IP) – these are municipal investment projects aimed at improving and maybe enlarging current infrastructure and, hence, improving municipal services provided to the population.

Enabling projects (EP) – these are projects aimed at ensuring that infrastructure investments may be implemented and operated successfully, not only in the short- to mid- term but also in the long-term.

Short-term projects (ST) – these are projects to be launched and finalised before 2030.

Mid-term projects (MT) – these are projects to be launched and finalised before 2040.

Long-term projects (LT) - these are projects to be launched before 2050.

Table 1-1 below provides an overview of the PIP for WSS.

Table 1-1 PIP for WSS, Overview[1]

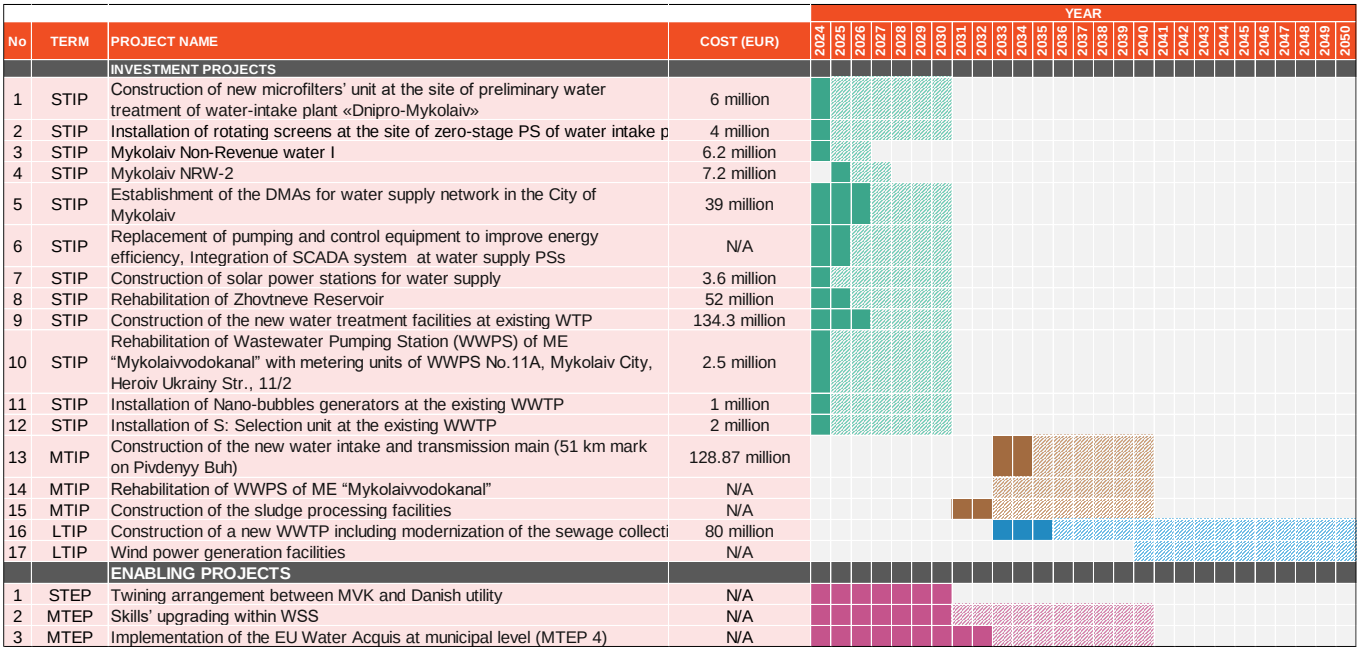
Project # & type	Title	CAPEX, 2024 prices	Beneficiary
Investment projects			
Short-term projects			
1 - STIP	Preliminary water treatment (Construction of New Microfilters' Unit)	EUR 6 million	MVK
2 - STIP	0-Pumping Station (Installation of Rotating Screens at Zero-Stage PS at Water Intake Plant "Dnipro-Mykolaiv")	EUR 4 million	MVK
3 - STIP	Mykolaiv Non - Revenue water 1	EUR 6.2 million	MVK
4 - STIP	Mykolaiv Non - Revenue water 2	EUR 7.2 million	MVK
5 - STIP	Establishment of the DMAs for water supply network in the City of Mykolaiv	EUR 39 million	MVK
6 - STIP	Replacement of pumping and control equipment with SCADA integration	N/A	MVK
7 - STIP	Solar power station for the water supply	EUR 3.6 million	MVK
8 - STIP	Zhovtneve Reservoir	EUR 84 million	MVK
9 - STIP	New water treatment facilities	EUR 134.3 million	MVK
10 - STIP	Rehabilitation of WWPS, No.11A	EUR 2.5 million	MVK
11 - STIP	Nano-Bubbles at WWTP	EUR 1 million	MVK
12- STIP	Sludge Installation	EUR 2 million	MVK
Mid-term projects			

13 - MTIP	New water intake	EUR 128.87 million	MVK
14 - MTIP	Modernization of WWPS	N/A	MVK
15 - MTIP	Sludge Processing	N/A	MVK
Long-term projects			
16 - LTIP	New WWTP	EUR 80 million	MVK
17 - LTIP	Wind power for WSS	N/A	MVK
Enabling projects			
Short-term projects			
1 - STEP	Twinning arrangement	N/A	MVK
Mid-term projects			
2 - MTEP	Technical education	N/A	MVK
3 - MTEP	EU Water Acquis	N/A	MVK

Table 1-2 below presents the project implementation timeline.

Table 1-2 Project implementation timline

No	TERM	PROJECT NAME	COST (EUR)
		INVESTMENT PROJECTS	
1	STIP	Construction of new microfilters' unit at the site of preliminary water treatment of water-intake plant «Dnipro-Mykolaiv»	6 million
2	STIP	Installation of rotating screens at the site of zero-stage PS of water intake p	4 million
3	STIP	Mykolaiv Non-Revenue water I	6.2 million
4	STIP	Mykolaiv NRW-2	7.2 million
5	STIP	Establishment of the DMAs for water supply network in the City of Mykolaiv	39 million
6	STIP	Replacement of pumping and control equipment to improve energy efficiency, Integration of SCADA system at water supply PSs	N/A
7	STIP	Construction of solar power stations for water supply	3.6 million
8	STIP	Rehabilitation of Zhovtneve Reservoir	52 million
9	STIP	Construction of the new water treatment facilities at existing WTP	134.3 million
10	STIP	Rehabilitation of Wastewater Pumping Station (WWPS) of ME "Mykolaivvodokanal" with metering units of WWPS No.11A, Mykolaiv City, Heroiv Ukrainy Str., 11/2	2.5 million
11	STIP	Installation of Nano-bubbles generators at the existing WWTP	1 million
12	STIP	Installation of S: Selection unit at the existing WWTP	2 million
13	MTIP	Construction of the new water intake and transmission main (51 km mark on Pivdenyy Buh)	128.87 million
14	MTIP	Rehabilitation of WWPS of ME "Mykolaivvodokanal"	N/A
15	MTIP	Construction of the sludge processing facilities	N/A
16	LTIP	Construction of a new WWTP including modernization of the sewage collecti	80 million
17	LTIP	Wind power generation facilities	N/A
		ENABLING PROJECTS	
1	STEP	Twining arrangement between MVK and Danish utility	N/A
2	MTEP	Skills' upgrading within WSS	N/A
3	MTEP	Implementation of the EU Water Acquis at municipal level (MTEP 4)	N/A



In the remaining part of this annex the investment projects and enabling projects are presented.

2 Investment projects

Proposed investment projects in Mykolaiv City for the Vodokanal encompass various initiatives aimed at enhancing the city's water infrastructure, addressing water supply and treatment issues, and improving overall water management services as well as watewater management. These investment projects are crucial for the Vodokanal to enhance service delivery, ensure sustainable water management, meet growing demands, repair critical infrastructure related to the war situation, comply with regulations, and ultimately improve the quality of life for residents in Mykolaiv City. They represent a proactive approach towards addressing water-related challenges and securing a reliable and sustainable water supply and wastewater services for the community.

2.1 STIP – Preliminary water treatment

Title	Construction of new microfilters' unit at the site of preliminary water treatment of water-intake plant «Dnipro-Mykolaiv».
Sector	Water supply
Objective(s)	• Objective 1 Renovation of microfiltration technological line for improvement of initial quality of the raw water from the Dnipro River • Objective 2 Construction of new building due to the demolition of the existing facilities • Objective 3 Decrease of the volume of NRW
Key outputs	• New building of the preliminary water preparation constructed. • 12 microfiltration units installed
Key tasks	• The existing design documentation should be fully reviewed. • BoQs to be reviewed. • Tendering documentation should be developed. • Tender procedure to be carried. • Construction of a new building • Installation of 12 microfiltration units
Expected timeline of project	Tentative duration of the construction – 12 months.
Estimated investment cost (CAPEX)	UAH 240,0 million EUR 6,0 million VAT and overhead costs excluded. 2024 prices.
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. Key activities according to the EU Taxonomy Compass: 5.1 - Construction, extension and operation of water collection, treatment and supply systems
Critical observation points	• The building of the water-treatment plant has been completely destroyed, the new design should be developed and approved that can take time. • Prices increased, therefore the new BoQs should be approved. • Increased CAPEX. • Insecure situation with the time planning of the project due to the area where it is risky to perform any works for now.
Related studies, projects and programmes	• "Long-term strategic program for rehabilitation and modernization of the water supply and wastewater system in the City of Mykolaiv", developed by Mykolaiv City, 2020. Program has been approved by the City Council, 2020 • "Concept document for rehabilitation of the existing WTP", developed by Posch and Partners, 2017.
Readiness of project documents, including design documents	• The existing design should be fully reviewed due to the entire demolition of the building of microfiltration unit. • Due to the serious price increase on the world market the BoQs have to be also reviewed.
Funding opportunities	• EBRD
Interested local companies	To be identified
Background	Microfiltration unit plays important role in the process of purification of the raw water during the season of algae blooming (eutrophication). Due to the massive presence of the algae in the raw water MVK has to spend in two times more clean water for the process of backwashing of the sand filters at the WTP. It has direct negative impact on the energy consumption.

Beneficiary	MVK
Other stakeholders	Mykolaiv city administration, Mykolaiv City Council

2.2 STIP – 0-stage Pumping station

Title	Installation of rotating screens at the site of zero-stage PS of water intake plant «Dnipro-Mykolaiv»
Sector	Water supply
Objective(s)	• Objective 1 Renovation of anti-shell protection system. • Objective 2 Protection of the pumps at water intake facilities.
Key outputs	• Rehabilitated and protected PS at the water intake. • Installed new modern three stainless rotating screen. • Secured preliminary water cleaning at the water intake at the plant.
Key tasks	• BoQs to be reviewed. • Tendering documentation should be developed. • Tender procedure to be carried. • The construction of a new building should be done. • Installation of rotating screens to be executed.
Expected timeline of project	Duration of the project – 2 months after supply of the equipment
Estimated investment cost (CAPEX)	UAH 160,0 million EUR 4,0 million VAT and overhead costs excluded. 2024 prices.
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. Key activities according to the EU Taxonomy Compass: 5.2 - Renewal of water collection, treatment and supply systems
Critical observation points	• The building of the water-treatment plant has been completely destroyed, the new design should be developed and approved that can take time. • Prices increased, therefore the new BoQs should be approved. • Increased CAPEX. • Insecure situation with the time planning of the project due to the area where it is risky to perform any works for now.
Related studies, projects and programmes	• “Long-term strategic program for rehabilitation and modernization of the water supply and wastewater system in the City of Mykolaiv”, developed by Mykolaiv City. Program has been approved by the City Council, 2020 • “Concept document for rehabilitation of the existing WTP”, developed by Posch and Partners, 2017.
Readiness of project documents, including design documents	Design documents passed state expertise and ready.
Funding opportunities	EBRD
Interested local companies	To be identified
Background	The installation of rotating screens at the preliminary water treatment site is a strategic measure aimed at enhancing the initial stages of the water purification process. These screens, often referred to as rotary drum screens or sieves, are pivotal components that aid in the removal of larger debris, solids, and foreign particles from untreated water before it undergoes further treatment. Planned overall budget from the state budget is 274 mio. UAH budget for pumping.
Beneficiary	MVK
Other stakeholders	Mykolaiv City Council

2.3 STIP – Mykolaiv Non-Revenue Water 1

Title	Mykolaiv Non-Revenue water I
Sector	Water supply
Objective(s)	• Objective 1 Lowering NRW. • Objective 2 Improvement of the energy efficiency of the enterprise. • Objective 3 Enhancement of the quality of water supply services. • Objective 4 Network Monitoring. • Objective 5 Leak Detection and Control. • Objective 6 Operational Optimization.
Key outputs	• Sustainable water supply in a microdistrict of Korabelnyy district in Mykolaiv. • Reduced production and or extraction of the already scarce local water resources. • Improved water consumption metering
Key tasks	• Development of the related Feasibility Study and Design documents. • Tendering documentation should be developed. • Tender procedure to be carried. • PIU consultant to be chosen. • Executing a tender. • Replacement of pumping equipment, pipes. • Installation of master water meters in multistoried buildings.
Expected timeline of project	Duration of the project – 12 months totally and 2 months after supply of the equipment
Estimated investment cost (CAPEX)	UAH 240 million EUR 6.2 million VAT and overhead costs excluded. 2024 prices.
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. Key activities according to the EU Taxonomy Compass: 5.2 - Renewal of water collection, treatment and supply systems
Critical observation points	• None
Related studies, projects and programmes	• Feasibility Study on the Project “Development of the Water Supply and Wastewater System in the City of Mykolaiv”, prepared by TACIS, 2006. • “Diagnostic analysis of the water supply network of the MVK”, 2023 prepared by GFA on the request of ICRC. • “Non-Revenue Water: Technical Assessment and Investment Plan for a selected district in Mykolaiv city, Ukraine”, 2024 prepared by iC Consulenten Ukraine.
Readiness of project documents, including design documents	Design documents passed state expertise and ready.
Funding opportunities	DSIF, NEFCO
Interested local companies	To be identified
Background	The project financed by DSIF in Korabelnyi district of Mykolaiv city. NEFCO, as Fund Manager, intends to prepare for and later integration of a non-revenue water project in Mykolaiv City. The Project aims to reduce the amount of NRW, which is currently around 40%. The Project is requested by the Vodokanal and City of Mykolaiv, who would like to expand the ongoing work within the city related to NRW.

Beneficiary	MVK
Other stakeholders	Mykolaiv City Council

2.4 STIP – Mykolaiv Non-Revenue water 2

Title	Mykolaiv NRW -2
Sector	Water supply
Objective(s)	• Objective 1 Lowering NRW. • Objective 2 Improvement of the energy efficiency of the enterprise. • Objective 3 Enhancement of the quality of water supply services. • Objective 4 Network Monitoring. • Objective 5 Leak Detection and Control. • Objective 6 Operational Optimization.
Key outputs	• Sustainable water supply in Mykolaiv. • Complete and update GIS database on network assets. • Calibrated hydraulic model of entire network.
Key tasks	• Development of the related Feasibility Study and Design documents. • Tendering documentation should be developed. • Tender procedure to be carried. • PIU consultant to be chosen.
Expected timeline of project	Duration of the project – 12-15 months, start in 2025
Estimated investment cost (CAPEX)	UAH 300,0 million EUR 7.5 million VAT and overhead costs excluded. 2024 prices
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. Key activities according to the EU Taxonomy Compass: 5.2 - Renewal of water collection, treatment and supply systems
Critical observation points	• None
Related studies, projects and programmes	• Feasibility Study on the Project “Development of the Water Supply and Wastewater System in the City of Mykolaiv”, prepared by TACIS, 2006. • “Diagnostic analysis of the water supply network of the MVK”, 2023 prepared by GFA on the request of ICRC. • “Non-Revenue Water: Technical Assessment and Investment Plan for a selected district in Mykolaiv city, Ukraine”, 2024 prepared by iC Consulenten Ukraine.
Readiness of project documents, including design documents	Design documents passed state expertise and ready.
Funding opportunities	MFA Denmark, NEFCO
Interested local companies	To be identified
Background	The project is financed by MFA-DK. Based on existing experiences from Mykolaiv and building on top on a project financed by DSIF in Korabelnyi district of the city, NEFCO, as Fund Manager, intends to prepare for and later integration of a second non-revenue water project in selected area of Mykolaiv City.
Beneficiary	MVK
Other stakeholders	Mykolaiv City Council

2.5 STIP – DMAs

Title	Establishment of the DMAs for water supply network in the City of Mykolaiv
Sector	Water supply
Objective(s)	• Objective 1 Lowering NRW. • Objective 2 Improvement of the energy efficiency of the enterprise. • Objective 3 Enhancement of the quality of water supply services. • Objective 4 Network Monitoring. • Objective 5 Leak Detection and Control. • Objective 6 Operational Optimization.
Key outputs	• Sustainable water supply in Mykolaiv • Complete and update GIS database on network assets. • Calibrated hydraulic model of entire network. • DMA design for entire network. • General Plan for Network Rehabilitation, including - Replacement of 980 km network pipes with pipes of appropriate diameter and material. - Installation of isolation valves, bulk water meters, SCADA. - Installation of flow control valves, air release valves, fire hydrants, manholes, washout chambers, siphons, river crossings and other relevant structures. • Reconstruction of 150,000 house connections. • Rehabilitation of 25 BPS
Key tasks	• Hydraulic modelling. • Identification of the DMAs • Development of the related Feasibility Study and Design documents. • Conduct a comprehensive network survey incl. a combination of GIS-based site data collection and surveying available records in MVK to develop a complete database with all parameter of the entire distribution network. • Procure hydraulic modelling software for MVK. • Develop a complete and calibrated hydraulic model (pre-condition for DMA design). • Design an estimated 70 DMAs for the entire network. • Elaborate BoQs and specifications for DMA implementation (considering SCADA). • Elaborate BoQs and specifications for pipe replacement and network upgrading (considering SCADA). • Elaborate a sequenced pipe replacement implementation plan, incl. bankable investment packages (incl. BPS rehabilitation and design of house connections). • Determine priority areas for most urgent implementation.
Expected timeline of project	Tentative project duration – 36 months
Estimated investment cost (CAPEX)	Estimated Costs: UAH 1.56 bln Estimated Costs: EUR 39 million VAT and overhead costs excluded. 2024 prices.
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. Key activities according to the EU Taxonomy Compass: 5.1 - Construction, extension and operation of water collection, treatment and supply systems.
Critical observation points	• Current situation related to war. • Hydraulic modelling is the key task to implement DMA.

	• Verification GIS network to be executed as well.
Related studies, projects and programmes	• Feasibility Study on the Project “Development of the Water Supply and Wastewater System in the City of Mykolaiv”, prepared by TACIS, 2006. • “Diagnostic analysis of the water supply network of the MVK”, 2023 prepared by GFA on the request of ICRC.
Readiness of project documents, including design documents	The documents are ready
Funding opportunities	• ICRC, EIB, NEFCO Some part of this project is started by ICRC
Interested local companies	• To be identified
Background	The establishment of District Metered Areas (DMAs) for the water supply network in the City of Mykolaiv signifies a strategic initiative to enhance the efficiency and management of the city's water distribution system. DMAs are delineated sections within the water supply network equipped with meters to monitor and control water flow.
Beneficiary	MVK
Other stakeholders	Mykolaiv City Council

2.6 STIP – Replacement of pumping and control equipment with SCADA integration

Title	**Replacement of pumping and control equipment to improve energy efficiency, Integration of SCADA system at water supply PSs**
Sector	Water supply
Objective(s)	• Improvement of energy efficiency of the Mykolaiv City central water supply system, through harmonization of main pumping stations characteristics with the characteristics of the water distribution system and consumption modes. • Improving operational efficiency and setting the foundation for automated control system.
Key outputs	• Detailed efficiency assessment of Lift III, IV and Northern Lift PS. • Detailed hydraulic models for all three lifting stations. • Verified pumping equipment characteristics. • Automatic control stations, ready to be integrated into SCADA. • New pumping and control equipment in three lifting stations • Energy consumption reduction of 25% to more than 50%. • Reduced maintenance and repair needs. • Longer lifespan of pumps and motors. • Reduction of operational interruptions at pumping stations due to reduced maintenance and repair needs • Continuous and real-time monitoring of various parameters. • Immediate alerts and alarms for critical events or deviations from normal operating conditions. • Storage of historical data, allowing operators to review trends, patterns, and performance over time. • Visualization of network conditions through graphical representations, maps, and dashboards. • Modern SCADA systems with encryption, user authentication, and access controls. • Monitoring and optimizing energy usage. • System which can be scaled in accordance with demand
Key tasks	• Detailed pumping station efficiency assessment. (It will be mandatory to organize the collection of objective characteristics of energy consumption and corresponding water supply volumes for each pumping station). • Selection of pumping characteristics and appropriate automatic control stations with frequency converters: • Verification of correctness of selection of pumping equipment characteristics and assessment of predicted efficiency of their operation in different consumption modes should be done through creation of hydraulic models of their operation. • Automatic control stations should be selected based on the required capacity and with functions that take into account their subsequent use in SCADA and possibly DMA systems. • Procurement and installation of necessary equipment • Assess needs define main tasks. • Develop detailed system design – hardware, software, network architecture and data flow. • Identify and install necessary data collection devices. • Procure appropriate SCADA software. • Integrate SCADA with other existing systems. • Conduct comprehensive system testing to validate SCADA functionality. • Prepare system manuals, operation procedures and maintenance instructions.

	• Train operators.
Expected timeline of project	Tentative project duration – 10-12 months
Estimated investment cost (CAPEX)	N/A VAT and overhead costs excluded. 2024 prices.
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. Key activities according to the EU Taxonomy Compass: 5.1 - Construction, extension and operation of water collection, treatment and supply systems.
Critical observation points	• Current situation related to war. • Limited support from MVK staff. • Long term queue for equipment production might cause significant delays
Related studies, projects and programmes	• Feasibility Study on the Project “Development of the Water Supply and Wastewater System in the City of Mykolaiv”, prepared by TACIS, 2006. • “Diagnostic analysis of the water supply network of the MVK”, 2023 prepared by GFA on the request of ICRC. • Concept document for the pilot DMA, 2017 prepared by Posch & Partners. Some part of this project is initiated by ICRC.
Readiness of project documents, including design documents	Mentioned documents provided recommendation on upgrade of the pumping station and integration of SCADA system.
Funding opportunities	ICRC, EIB
Interested local companies	• To be identified
Background	
Beneficiary	MVK
Other stakeholders	Mykolaiv City Council

2.7 STIP – Solar power stations for the water supply

Title	Construction of solar power stations for water supply
Sector	Water supply
Objective(s)	• Objective 1 Improvement of the energy efficiency of Mykolaiv water utility. • Objective 2 Decrease of CO2 emission. • Objective 3 Decrease of OPEX of the water utility. • Objective 4 Enhancement of the reliability of the power supply to water utility.
Key outputs	• Three (+) solar power generation stations at the water supply facilities of Mykolaivvodokanal.
Key tasks	• Development of the design documentation. • Tender documentation development. • Tender procedure. • Tender, procurement, delivery of the solar panels. • Construction of three (+) solar power generation stations at the water supply facilities of Mykolaivvodokanal (WTP, 3rd Stage water pumping station, water-intake). • Equipment supply and installation works.
Expected timeline of project	Project duration – 6 months
Estimated investment cost (CAPEX)	UAH 147.6 million EUR 3.5 million VAT and overhead costs excluded. 2024 prices.
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. • Climate change mitigation. Key activities according to the EU Taxonomy Compass: 5.1 - Construction, extension and operation of water collection, treatment and supply systems. 4.1 - Electricity generation using solar photovoltaic technology
Critical observation points	• Current situation of the war conditions. • Feasibility study to be aligned with the situation at the time when the project starts. • Potential changes of the feed in tariff legislation. • Storage of the generated power solar might be an issue.
Related studies, projects and programmes	• Pre-feasibility study, prepared by Solar Service, a Mykolaiv based company, and Helios, a Dnipro based company that deals with solar power systems.
Readiness of project documents, including design documents	The project documents are not ready yet.
Funding opportunities	EIB, NEFCO
Interested local companies	To be identified
Background	The construction of solar electrical power stations within the water supply sector represents a forward-looking initiative aimed at integrating renewable energy sources into the infrastructure to power water treatment and distribution systems. By utilizing solar energy, these power stations generate electricity through photovoltaic panels, converting sunlight into electrical power. The construction of solar power stations also provides security for the water supply along with the stable tariffs for consumers.
Beneficiary	MVK
Other stakeholders	Mykolaiv City Council, UkrEnergo, State agency for energy-efficiency

2.8 STIP – Zhovtneve Reservoir

Title	Rehabilitation of Zhovtneve Reservoir
Sector	Water supply
Objective(s)	• Objective 1 Alternative source of the raw water • Objective 2 Safety of the water supply system for the city
Key outputs	• Entirely rehabilitated and modernized water reservoir.
Key tasks	• According to the outcomes of the related Feasibility Study. • Preparation of the project design documentation. • Preparation of Tender Documents • Procurement of a Contractor. • Construction works.
Expected timeline of project	Tentative project duration – 24 months
Estimated investment cost (CAPEX)	UAH 3.39 billion EUR 52.0 million VAT and overhead costs excluded. 2024 prices.
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. Key activities according to the EU Taxonomy Compass: 5.2 - Renewal of water collection, treatment and supply systems.
Critical observation points	• Current situation related to war. • High cost of the project. • It is an issue to fill in reservoir sustainably as there is no stable source at present time. • Climate change and risk of water evaporation in case of higher temperatures.
Related studies, projects and programmes	• Feasibility Study by EGIS on the alternative source of the raw water, February 2023 • Note on Future sustainable raw water source by COWI, October 2023.
Readiness of project documents, including design documents	Feasibility Study and Pre-design documents by EGIS are ready.
Funding opportunities	EIB, Danish state (DSIF)
Interested local companies	To be identified
Background	The rehabilitation of Zhovtneve Reservoir stands as a crucial endeavor aimed at restoring and enhancing the functionality of this important water storage facility.
Beneficiary	MVK
Other stakeholders	Mykolaiv City Council, Ministry of Infrastructure

2.9 STIP – New water treatment facilities

Title	Construction of the new water treatment facilities at existing WTP
Sector	Water supply
Objective(s)	• Objective 1 Restoration of drinking water supply system. • Objective 2 Sustainable drinking water supply. • Objective 3 Decrease of NRW. • Objective 4 Improvement of the quality of the drinking water
Key outputs	• Construction of new building for technological line for purification of the raw fresh water. • Installation of new modern water treatment equipment (pressure filtration technology). • Secured water cleaning from the different sources of the raw water.
Key tasks	• Design documentation should be prepared. • Tendering documentation should be developed. • Tender procedure to be carried. • The construction of a new facilities should be done. • Installation of new water treatment equipment to be executed. • geodesic, geologic
Expected timeline of project	Duration of the project – 3 years
Estimated investment cost (CAPEX)	UAH 5.5 billion EUR 134.3 million VAT and overhead costs included. 2024 prices.
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use of the water resources in the conditions of the climate change. Key activities according to the EU Taxonomy Compass: 5.2 - Renewal of water collection, treatment and supply systems
Critical observation points	• Current situation related to war. • The final decision on the technology will be done only after the respective series of the technological tests. • Needs final decision on the potential option of the use of brackish water from the P. Buh estuary.
Related studies, projects and programmes	• “Long-term strategic program for rehabilitation and modernization of the water supply and wastewater system in the City of Mykolaiv”, developed by Mykolaiv City, 2020. Program has been approved by the City Council, 2020. • “Concept document for rehabilitation of the existing WTP”, developed by Posch and Partners, 2017. • Feasibility study and preliminary design, 2023 prepared by EGIS under UMIP, financed by EIB.
Readiness of project documents, including design documents	• Preliminary design is ready • Design documentation should be developed
Funding opportunities	• EIB, DSIF
Interested local companies	• To be identified

Background	Due to the reason of diversification of the sources of the raw water for the centralized water supply system, it is necessary to implement respective effective water treatment technology suitable for the different sources of raw water (including brackish water)
Beneficiary	MVK
Other stakeholders	Mykolaiv City Council

2.10 STIP – Rehabilitation of WWPS

Title	Rehabilitation of Wastewater Pumping Station (WWPS) of ME "Mykolaivvodokanal" with metering units of WWPS No.11A, Mykolaiv City, Heroiv Ukrainy Str., 11/2.
Sector	Wastewater treatment
Objective(s)	• Objective 1 Prevention of negative influence on the local environment due to the emergency interruption. • Objective 2 Enhancement of energy efficiency and general reliability of the WWPS and sanitation services. • Objective 3 Improvement of the reliability of the wastewater collection system.
Key outputs	• Entirely rehabilitated and modernized WWPS.
Key tasks	• Tender procedure. • Tender and constructs to be signed for the construction works. • Construction works.
Expected timeline of project	Project duration – 8,5 months
Estimated investment cost (CAPEX)	UAH 100 million EUR 2.5 million VAT and overhead costs excluded. 2024 prices.
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. Key activities according to the EU Taxonomy Compass: 5.3 - Construction, extension and operation of waste water collection and treatment.
Critical observation points	• Current situation related to war. • Hydraulic calculations for the networks and pumps should be reviewed. • Lack of the SCADA system. • Pressure out-coming collectors should be replaced.
Related studies, projects and programmes	• Long-term strategic program for rehabilitation and modernization of the water supply and wastewater system in the City of Mykolaiv", developed by Mykolaiv City, 2020. Program has been approved by the City Council, 2020.
Readiness of project documents, including design documents	• Design documents are ready. • BoQs 2021 should be updated.
Funding opportunities	• EIB
Interested local companies	• To be identified
Background	The rehabilitation of wastewater pumping station (WWPS) No. 11A, situated at Heroiv Ukrainy Str., 11/2 in Mykolaiv City, undertaken by ME "Mykolaivvodokanal," signifies a crucial step in upgrading the city's wastewater infrastructure. This project involves the comprehensive rehabilitation of the pumping station, including the installation of modern metering units aiming at optimizing the performance improved service reliability.
Beneficiary	MVK
Other stakeholders	Mykolaiv City Council.

2.11 STIP – Nano-Bubbels at WWTP

Title	Installation of Nano-bubbles generators at the existing WWTP
Sector	Wastewater
Objective(s)	• Objective 1. Improve biological treatment process. • Objective 2. Increase of energy efficiency. • Objective 3. Decrease of the negative influence on the Pivdennyi Buh River ecosystem.
Key outputs	• Two Nano-bubbles generators installed and put into operation.
Key tasks	• Development of the respective Feasibility Study. • Development of the design documentation. • Development of the tender documentation. • Procurement procedures. • Procurement, delivery and installation of the technological equipment.
Expected timeline of project	Project duration – 8 months
Estimated investment cost (CAPEX)	UAH 40,0 million EUR 1.0 million VAT and overhead costs excluded. 2024 prices.
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. Key activities according to the EU Taxonomy Compass: 5.3 - Construction, extension and operation of wastewater collection and treatment. 5.6 - Anaerobic digestion of sewage sludge.
Critical observation points	• It's a new technology that haven't proved itself with the time. This technology has been working in the EU countries for 2 years. • Integration of this new technology into the existing process of biological treatment.
Related studies, projects and programmes	• “Long-term strategic program for rehabilitation and modernization of the water supply and wastewater system in the City of Mykolaiv”, developed by Mykolaiv City. Program has been approved by the City Council, 2020. • “Concept document for rehabilitation of the existing WTP”, developed by Posch and Partners, 2017.
Readiness of project documents, including design documents	• Technical specification on equipment is ready, prepared by the Danish company Techras Nano.
Funding opportunities	• to be identified
Interested local companies	• Techras Nano
Background	The installation of Nano-bubble generators at the existing wastewater treatment plant signifies an innovative approach to enhance the treatment processes and improve the overall efficiency of wastewater treatment. Nano-bubbles are minuscule gas bubbles, typically smaller than 100 nanometers in diameter, known for their high gas dissolution and prolonged retention in water.
Beneficiary	MVK
Other stakeholders	Mykolaiv City Council

2.12 STIP – Sludge installation

Title	Installation of S: Selection unit at the existing WWTP
Sector	Wastewater
Objective(s)	• Objective 1 Improve biological treatment process • Objective 2 Increase of energy efficiency • Objective 3 Decrease of the negative influence on the Pivdennyi Buh River ecosystem.
Key outputs	• Installed technology for the more efficient sludge processing. • Significant improvement of the sedimentation process.
Key tasks	• Development of the respective Feasibility Study. • Development of the design documentation. • Development of the tender documentation. • Procurement procedures. • Procurement, delivery and installation of the technological equipment.
Expected timeline of project	Project duration – 12 months.
Estimated investment cost (CAPEX)	UAH 80.0 million EUR 2.0 million VAT and overhead costs excluded. 2024 prices.
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. Key activities according to the EU Taxonomy Compass: 5.3 - Construction, extension and operation of wastewater collection and treatment. 5.6 - Anaerobic digestion of sewage sludge.
Critical observation points	This technology has been proved already at the WWTP in Denmark and other countries in EU. Through integration of this new technology for Ukraine into the existing process of biological treatment and aligning it with the nano-bubbles technology can be an issue.
Related studies, projects and programmes	• "Long-term strategic program for rehabilitation and modernization of the water supply and wastewater system in the City of Mykolaiv", developed by Mykolaiv City. Program has been approved by the City Council, 2020. • "Concept document for rehabilitation of the existing WTP", developed by Posch and Partners, 2017.
Readiness of project documents, including design documents	• The technology is already applied at WWTP in Copenhagen. • Technical specification on equipment is ready, prepared by the Danish company TECHRAS Miljø.
Funding opportuntities	• To be identified
Interested local companies	• TECHRAS Miljø
Background	This technology is supplementary to the nano-bubbles technology that together gives efficient effect for the wastewater treatment from the point of air usage and ability of sludge production.
Beneficiary	MVK
Other stakeholders	Mykolaiv City Council

2.13 MTIP – New water intake

Title	Construction of the new water intake and transmission main (51 km mark on Pivdenyy Buh)
Sector	Water supply
Objective(s)	• Objective 1 Alternative source of the raw water • Objective 2 Safety of the water supply system for the city
Key outputs	• Sustainable water supply in Mykolaiv • New water intake and transmission facilities.
Key tasks	• Development of the respective Feasibility Study. • Development of the design documentation. • Development of the tender documentation. • Tender and procurement procedures. • Obtaining necessary permits. • Land allocation issues. • Connection to the electrical grid. • Tendering and constructs with the contractor. • Procurement of a Contractor. • Construction works and Supervision activities.
Expected timeline of project	Tentative project duration – 24 months
Estimated investment cost (CAPEX)	UAH 5.3 billion EUR 128.87 million VAT and overhead costs excluded. 2024 prices.
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. Key activities according to the EU Taxonomy Compass: 5.1 - Construction, extension and operation of water collection, treatment and supply systems
Critical observation points	• Current situation related to war. • Final decision on the construction site. • Climate change issue should be considered (total potential available yield at the abstraction point in the future). • Quality of the water due to the discharges from the local WWTP on Nova Odessa town.
Related studies, projects and programmes	• Feasibility Study by EGIS on the alternative source of the raw water, February 2023 • Note on sustainable raw water source by COWI, October 2023.
Readiness of project documents, including design documents	• Feasibility Study by EGIS, 2023 • High on agenda at Mykolaiv City and central government
Funding opportunities	• EIB, DSIF
Interested local companies	• To be identified
Background	The construction of a new water intake and transmission main at the 51 km mark on Pivdenyy Buh (Southern Bug River) marks a significant infrastructure development aimed at bolstering the region's water supply system providing an alternative water source for reliable water supply. This project involves the establishment of a new water intake facility and a transmission main along the Southern Bug River, spanning a distance of 51 kilometers.
Beneficiary	MVK

Other stakeholders	Mykolaiv City Council, Ministry of Infrastructure, local administrations in the area of new water intake construction.

2.14 MTIP – WWPS modernization

Title	Rehabilitation of WWPS of ME "Mykolaivvodokanal"
Sector	Wastewater treatment
Objective(s)	• Objective 1 Prevention of negative influence on the local environment due to the emergency interruption. • Objective 2 Enhancement of energy efficiency and general reliability of the WWPS and sanitation services. • Objective 3 Improvement of the reliability of the wastewater collection system.
Key outputs	• Entirely rehabilitated and modernized WWPS.
Key tasks	• Development of the respective Feasibility Study. • Development of the design documentation. • Development of the tender documentation. • Procurement procedures. • Procurement, delivery and installation of the technological equipment.
Expected timeline of project	Project duration – N/A
Estimated investment cost (CAPEX)	N/A
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. Key activities according to the EU Taxonomy Compass: 5.3 - Construction, extension and operation of wastewater collection and treatment.
Critical observation points	• Current situation related to war. • Hydraulic calculations for the networks and pumps should be reviewed. • Lack of the SCADA system. • Pressure out-coming collectors should be replaced. • Prioritization of the tasks and needs
Related studies, projects and programmes	• "Long-term strategic program for rehabilitation and modernization of the water supply and wastewater system in the City of Mykolaiv", developed by Mykolaiv City. Program has been approved by the City Council, 2020. • Projects: Rehabilitation of WWPS of ME "Mykolaivvodokanal" with recording units of WWPS No.11A, No 17, No2 and No1.
Readiness of project documents, including design documents	N/A
Background	The rehabilitation of wastewater pumping station signifies a crucial step in upgrading the city's wastewater infrastructure. This project involves the comprehensive rehabilitation of the pumping station, including the installation of modern metering units aiming at optimizing the performance improved service reliability.
Funding opportunities	To be identified
Interested local companies	To be identified
Beneficiary	MVK
Other stakeholders	Mykolaiv City Council

2.15 MTIP – Sludge processing

Title	Construction of the sludge processing facilities
Sector	Wastewater treatment
Objective(s)	• Objective 1 Prevention of negative influence on the local environment due to the emergency interruption. • Objective 2 Enhancement of energy efficiency of the enterprise. • Objective 3 Improvement of general reliability of sanitation cervices.
Key outputs	• Construction of the new modern facilities for the sludge processing (including co-generation).
Key tasks	• Development of the respective Feasibility Study. • Development of the design documentation. • Development of the tender documentation. • Tender and procurement procedures. • Procurement, delivery and installation of the technological equipment. • Construction
Expected timeline of project	Tentative project duration – 24 months
Estimated investment cost (CAPEX)	N/A
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. Key activities according to the EU Taxonomy Compass: 5.3 - Construction, extension and operation of wastewater collection and treatment. 4.20 - Cogeneration of heat/cool and power from bioenergy.
Critical observation points	Constructing a sludge processing facility requires a comprehensive approach that encompasses technological considerations, environmental impact assessments, regulatory compliance, safety protocols, and community engagement to ensure efficient and sustainable operations. All of these observations needs to form part of the feasibility study and allocation of adequate risks and mitigations shall be catered for in the feasibility study. • Final decision on the construction site should be done. • Selection of respective technology is in not finalized yet. • Co-generation component has to be considered. • ESIA should be done.
Related studies, projects and programmes	• “Long-term strategic program for rehabilitation and modernization of the water supply and wastewater system in the City of Mykolaiv”, developed by Mykolaiv City. Program has been approved by the City Council, 2020.
Readiness of project documents, including design documents	N/A
Funding opportunities	To be identified
Interested local companies	To be identified
Background	The construction of sludge processing facilities is integral in establishing a comprehensive and environmentally conscious approach to managing wastewater treatment by effectively addressing the handling, treatment, and utilization of sludge, contributing to sustainable resource management and environmental protection. These facilities encompass the development and implementation of specialized units and systems designed to handle, treat, and manage sludge.
Beneficiary	MVK

Other stakeholders	Mykolaiv City Council

2.16 LTIP – New WWTP

Title	Construction of a new WWTP including modernization of the sewage collection infrastructure
Sector	Wastewater
Objective(s)	• Objective 1 Prevention of negative influence on the local environment due to the emergency interruption. • Objective 2 Enhancement of energy efficiency and general reliability of the WWPS and sanitation services. • Objective 3 Improvement of the living condition in the city of Mykolaiv
Key outputs	• Entire new wastewater treatment plant and modernized sewage collection infrastructure (including sewage collectors and respective wastewater pumping stations).
Key tasks	• Development of the respective Feasibility Study. • Development of the design documentation. • Development of the tender documentation. • Tender and procurement procedures. • Procurement, delivery and installation of the technological equipment.
Expected timeline of project	Tentative project duration – 36 months
Estimated investment cost (CAPEX)	UAH 3200 million EUR 80 million VAT and overhead costs excluded. 2024 prices.
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. Key activities according to the EU Taxonomy Compass: 5.3 - Construction, extension and operation of wastewater collection and treatment.
Critical observation points	• Current situation related to war. • Land availability for the construction site is not finally confirmed. • Related hydraulic modelling is necessary. • ESIA should be done.
Related studies, projects and programmes	• “Long-term strategic program for rehabilitation and modernization of the water supply and wastewater system in the City of Mykolaiv”, developed by Mykolaiv City. Program has been approved by the City Council, 2020. • “Concept document for rehabilitation of the existing WTP”, developed by Posch and Partners, 2017. • MVK presentation of concept for new WWTP to DSIF, November 2021.
Readiness of project documents, including design documents	Concept document is ready. Source: MVK. Concept developed by Posch and Partners, 2017
Funding opportunities	DSIF
Interested local companies	To be identified
Background	The construction of a new Wastewater Treatment Plant (WWTP) alongside the modernization of sewage collection infrastructure represents a transformative endeavour aimed at enhancing wastewater management in Mykolaiv. Building a state-of-the-art Wastewater Treatment Plant equipped with advanced technologies and processes to efficiently treat and purify wastewater before discharge.
Beneficiary	MVK
Other stakeholders	Mykolaiv City Council

2.17 LTIP – Wind power for WSS

Title	Wind power generation facilities
Sector	Water supply/Wastewater
Objective(s)	• Objective 1 Improvement of the energy efficiency of Mykolaiv water utility • Objective 2 Decrease of CO2 emission • Objective 3 Decrease of OPEX of the water utility • Objective 4 Enhancement of the reliability of the power supply to water utility
Key outputs	• Installation of wind power generation facilities at the WWTP, WTP and water intake facilities.
Key tasks	• Development of the respective Feasibility Study. • Development of the design documentation. • Development of the tender documentation. • Tender and procurement procedures. • Obtaining necessary permits. • Land allocation issues. • Connection to the electrical grid. • Tendering and constructs with the contractor. • Procurement of a Contractor. • Construction works and Supervision activities. • Mention envisaged key tasks to be carried out to produce the outputs.
Expected timeline of project	Project duration – N/A
Estimated investment cost (CAPEX)	UAH N/A EUR N/A
Expected environmental impacts	Key environmental objectives of the EU Taxonomy addressed: • Sustainable use and protection of water and marine resources. • Climate change mitigation. Key activities according to the EU Taxonomy Compass: 5.1 - Construction, extension and operation of water collection, treatment and supply systems. 4.3.- Electricity generation from wind power
Critical observation points	• Current situation related to the war. • Selection of the construction sites. • Distance to the settlements. • Green tariff availability in the future. • Possibility to output to the centralized grid. • To define if it is an optimal solution
Related studies, projects and programmes	• “Long-term strategic program for rehabilitation and modernization of the water supply and wastewater system in the City of Mykolaiv”, developed by Mykolaiv City. Program has been approved by the City Council, 2020.
Readiness of project documents, including design documents	• Should be developed
Funding opportunities	• To be identifed
Interested local companies	• N/A
Background	The installation of wind power generation facilities at WWTPs, WTPs, and water intake facilities signifies a commitment to embracing renewable energy solutions, advancing sustainability goals, and promoting environmentally conscious practices within essential water infrastructure.
Beneficiary	ME “Mykolaivvodokanal

Other stakeholders	Mykolaiv City Council, UkrEnergo, State Agency for Energy-efficiency.

3 Enabling projects

In this section the proposed enabling projects are presented.

3.1 STEP – Twinning arrangement

Title	Twining arrangement between MVK and Danish utility
Sector	Water supply and sanitation
Objective(s)	The main objective of the twinning agreement is to strengthen the capacity of the recipient utility to improve the overall performance. More specifically, this implies to assist the recipient utility to maintain a sustainable infrastructure, secure a sound financial basis, improve customer satisfaction, increase staff competences and their sustained employment. A twinning agreement can either be established with focus on a pure capacity building of the recipient utility or more likely in connection with a larger infrastructure project. In Mykolaiv, an important part of the twinning agreement will focus on preparing the utility to include and apply the new facilities. Organizational changes due to the new infrastructure, a different paradigm for O&M activities, this both for infrastructure but also for the utility as a whole.
Key outputs	• Improved services in water supply and wastewater treatment • Establishing a service level, which encourages customers payments and thereby ensuring a sound financial utility • Increased staff competences and staff job satisfaction • MVK get introduced to new technology through Danish utility • Operation and maintenance practices based on asset management principles
Key tasks	• Study tours to Danish utilities • Internship at Danish utilities for MVK staff • On the job training • Introduction to new technology • Training of trainers • Establishment of good practices • Hotline between MVK and Danish utility
Expected timeline of project	2024-30, with a possible extension
Estimated investment cost (CAPEX)	N/A
Estimated operation and maintenance costs (OPEX)	N/A
SDGs affected	
Critical observation points	Staff with relevant competences shall be available. Staff will continue their engagement with MVK also after having received relevant training.
Related studies, projects and programs	N/A
Funding opportunities	EIB, DSIF
Interested local companies	VCS Denmark
Background	MVK will after the war become a utility with new staff having to operate new technology. Therefore, MVK needs intensive staff training and capacity building.
Beneficiary	MVK
Other stakeholders	Department of Housing and Municipal Services within Mykolaiv City Administration

3.2 MTEP – Technical education

Title	Skills' upgrading within WSS
Sector	WSS
Objective(s)	The objective is to facilitate a skills' upgrading of MVK staff and others involved in or working in the WSS sector.
Key outputs	• Staff within both the drinking water and wastewater sector will have obtained a background knowledge and understanding which will improve their performance at MVK. • Relevant Ukrainian institutions will have received assistance in development of curriculum for courses within the area of water supply and wastewater. For operational staff this could be inspired by the two Danish educations as Drinking Water Operator and Wastewater Operator. • Universities and technical colleges will provide theoretical courses on new technology regarding wastewater treatment processes, materials and process programming.
Key tasks	• Identify areas for capacity building • Identify relevant institutions • Develop Curriculum • Conduct the education
Expected timeline of project	2024-2030
Estimated investment cost (CAPEX)	N/A
Estimated operation and maintenance costs (OPEX)	N/A
SDGs affected	
Critical observation points	MVK management - and Department of Housing and Municipal Services within Mykolaiv City Administration – committed to skills' upgrading of staff.
Related studies, projects and programs	N/A
Funding opportunities	To be identified
Interested local companies	VCS, Denmark
Background	After the war MVK will need to include new staff, most likely also without any background in the water sector. Existing staff will need a boost when new facilities are established. The abovementioned twinning arrangement (STEP – Twinning arrangement) will provide transferral of knowledge on practical operation. It is assumed that several staff will need also increased theoretical background.
Beneficiary	MVK
Other stakeholders	Department of Housing and Municipal Services within Mykolaiv City Administration, as well as technical schools in Mykolaiv.

3.3 MTEP - EU Water Acquis

Title	Implementation of the EU Water Acquis at municipal level (MTEP 4)
Sector	WSS
Objective(s)	• Contribute to implementation of the EU Water Acquis in Ukraine • Facilitate successful implementation of the EU Water Acquis in Mykolaiv City
Key outputs	• Guide on EU Water Acquis highlighting key directives and enforcement mechanism • Gap analysis focusing on service levels and legal and regulatory framework • Training programme targeting Department of Housing and Municipal Services within Mykolaiv City Administration, as well as Mykolaiv Vodokanal • Ad-hoc assistance in data collection, processing and reporting to assess progress made in implementation of the EU Water Acquis on Mykolaiv City
Key tasks	• Development of Guide on EU Water Acquis • Deep dive into the key directives within the EU Water Acquis focusing on service levels and legal and regulatory framework • Development and execution of training programme (preferably, modular training programme) • Development of guide on data collection, processing and reporting, including templates, and ad-hoc assistance implementing this guide
Expected timeline of project	2024-2032
Estimated investment cost (CAPEX)	NA
Estimated operation and maintenance costs (OPEX)	NA
SDGs affected	
Critical observation points	• Availability of staff within Department of Housing and Municipal Services within Mykolaiv City Administration and Mykolaiv Vodokanal
Related studies, projects and programs	NA
Funding opportunities	To be identified
Related local companies	To be identified
Background	Implementation of the EU Water Acquis as part of the accession process of Ukraine to the EU constitutes a major challenge, not least because of the many heavy cost investments to be made, changes in legal and regulatory framework and altered work procedures. Lessons learned at the municipal level may make the challenges and, not least, actions to address the challenges clear and, hence, enlighten the actions at national level.
Beneficiary	Department of Housing and Municipal Services within Mykolaiv City Administration Contact person: Serhii Korenev, Deputy Mayor
Other stakeholders	Mykolaiv Vodokanal and Ministry of Infrastructure of Ukraine