



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION

**V&U**  
VERBAND KOMMUNALER  
UNTERNEHMEN e.V.



# TOWARDS GREEN RECONSTRUCTION OF UKRAINE

BEST PRACTICES FOR WASTE-WATER TREATMENT PLANTS

16 October 2024



# INTRODUCTION

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The reconstruction of Ukraine presents a crucial opportunity to align the country's rebuilding efforts with international best practices and foster partnerships that can expedite tangible results, ensuring that Ukraine's recovery is environmentally sound and resilient. By leveraging standards, Ukraine can rebuild in a way that supports long-term sustainability, making use of innovative practices and established frameworks. The war has severely impacted particularly water management in Ukraine, causing extensive damage to infrastructure and leading to widespread water shortages and quality issues. Millions of civilians face scarcity of safe drinking water, underscoring the vital role of water management in ensuring public health, environmental protection, and overall sustainability during conflict.

This workshop has been organized by UNIDO in partnership with the Association of Water Utilities of Ukraine (Vodokanal), VKU (Verband kommunaler Unternehmen), and associations of municipalities across Ukraine. By facilitating a dynamic exchange of knowledge between Ukrainian stakeholders and international experts, it addresses a critical component of the country's green reconstruction: sustainable water management practices. Through discussions on global best practices, the workshop provides valuable insights into how these approaches can be adapted to Ukraine's unique context. This collaborative effort will help rebuild Ukraine's infrastructure in a way that fosters environmental sustainability and resilience, establishing a solid foundation for the nation's recovery and long-term prosperity.

The event is organized in the context of the National Guiding Framework for Standards and Technical Regulations for the Green Reconstruction of Ukraine (NGF), developed by UNIDO and the Ministry of Economy of Ukraine. The NGF represents a comprehensive and pivotal framework to guide the rebuilding process, ensuring that it is environmentally sound and aligned with international standards. By establishing clear guidelines on standards and technical regulations, the NGF supports Ukraine's long-term vision of transitioning toward a low-carbon economy. The NGF is a collaborative effort of several partners, including the Ukrainian Standardization Body (UAS), CEN and CENELEC, and the British Standards Institution (BSI). It also benefits from substantial support from the Governments of Switzerland (through SECO) and Germany (through BMZ). The NGF focuses on several critical areas, with water management standing out as one of the most challenging topics for Ukraine at present.

Partnerships play a crucial role in addressing water management challenges during the war. The involvement of multiple stakeholders facilitates the mobilization of diverse resources, expertise, and funding, essential for implementing both short-term relief measures and long-term strategies. This workshop marks a pivotal step in advancing the implementation of the NGF, reaffirming UNIDO's commitment to supporting this process alongside key national and international partners to foster a sustainable future for Ukraine.

*With the participation  
of over 190 Ukrainian  
and international experts,  
municipality representatives,  
private sector representatives.*

## SPEAKERS

### OPENING REMARKS

**Mr. Dmytro Novytskyi**  
President, Association of  
Water Utilities of Ukraine

**Mr. Hans Joachim Fuchtel**  
Senior Expert, UNIDO

**Mr. Thomas Abel**  
Managing Director, Association of  
Local Public Utilities in Germany (VKU)



### PANEL DISCUSSION

**Mr. Oleksandr Kravchenko**  
Director, Institute of Municipal Infrastructure  
*Ukrainian perspective on sewage  
treatment plant operations*

**Mr. Siegfried Balleis (Prof.)**  
Former Mayor, Erlangen Municipality  
*Best practice in sewage treatment  
plant operations in Erlangen*



**Mr. Stefan Engelhardt**

**Head of the Department, Erlangen Municipality**

*Best practice in sewage treatment  
plant operations in Erlangen*



**Mr. Karam Koudary**

**Project manager on International  
cooperation, Hamburg Wasser**

*Best practice in sewage treatment  
plant operations in Hamburg*



## **CLOSING REMARKS AND MODERATION**

**Mr. Steffen Kaeser**

**Chief, UNIDO**



**Ms. Rita Bratash**

**National Expert on  
Green Recovery, UNIDO**



# OPENING REMARKS

## Mr. Dmytro Novytskyi

### President, Association of Water Utilities of Ukraine

- Given the substantial challenges Ukraine faces, there is a critical need to understand the standards and guidelines essential for the reconstruction of the country's infrastructure, facilities, and networks. Drawing from the experiences of European experts will serve as a strong foundation for effective rebuilding efforts.
- The economic issues confronting Ukraine's water utilities mirror national challenges, particularly concerning operational costs. Currently, major water utilities either lack established tariffs or have suspended them. Addressing this matter requires engaging with local and state authorities to identify sustainable funding solutions.
- Ongoing discussions with European colleagues explore the potential to translate and adapt European standards into Ukrainian, paving the way for their future implementation. This initiative is seen as a crucial step toward a structured and successful rebuilding process, offering a clear framework for the path ahead.

*“The support from European partners - with their extensive experience and tested practices - has already played a vital role in modernizing many Ukrainian water utilities prior to the war and will be even more relevant during the reconstruction phase of the Country.”*

## Mr. Hans Joachim Fuchtel

### Senior Expert, UNIDO

- Ukraine is at a transformative stage in its history, where the reconstruction process brings not only challenges but also unique opportunities to integrate sustainability into all aspects of its recovery. Innovative approaches and international standards can help this process to be more resilient, environmentally friendly, and with a long-term impact.
- This workshop highlights the strength of international cooperation, demonstrating how pooling expertise, knowledge, and resources from diverse backgrounds can generate effective solutions to Ukraine's current challenges. Through collaborative efforts, innovative frameworks can be developed to address pressing needs while establishing new benchmarks in resilience and sustainability.

*“Partnerships play an important role in Ukraine's green reconstruction. UNIDO remains committed to working with the Association of Water Utilities of Ukraine (Vodokanal), VKU (Verband kommunaler Unternehmen), the associations of municipalities across Ukraine, and other international partners to reinforce Ukraine's pathway toward a robust, sustainable future.”*

## Mr. Thomas Abel

### Managing Director, Association of Local Public Utilities in Germany (VKU)

- Representing Germany's public sector, VKU comprises over 1,500 members active in energy, water, and waste management. While national opportunities remain a core focus, members also engage in numerous international initiatives.
- VKU is a platform funded by the German Federal Ministry for Economic Development, established to promote global water management and foster partnerships, including with Ukraine. Despite the substantial challenges faced by Ukraine at present, VKU is committed to continue cooperating to support our Ukrainian partners. Water management is a field that directly impacts the lives of all people, it is therefore of paramount importance to provide Ukraine with sustainable and innovative solution in this area.

***“We are fully prepared to share best practices and hope our contributions will be beneficial. Our goal is to provide practical insights and experience that can be effectively implemented in Ukraine. It is a privilege to have the opportunity to collaborate with Ukrainian colleagues.”***



## PANEL DISCUSSION

### Mr. Oleksandr Kravchenko

#### Director, Institute of Municipal Infrastructure

##### *Ukrainian perspective on sewage treatment plant operations*

- Ukraine's water utilities face immense challenges due to the ongoing conflict, including damage to infrastructure, frequent power outages, limited resource supplies, and workforce shortages. Additionally, economic pressures from rising costs of energy and materials, combined with regulated tariffs, exacerbate the financial strain on these utilities. Ensuring sustainable operations and protecting water sources remain critical priorities, especially in conflict-affected regions.
- Nevertheless, notable advancements are being made despite these challenges, notable advancements are being made. Initiatives such as iron removal stations in cities like Ternopil, Bucha, Chervonohrad, and Boryspil, and the construction or upgrading of sewage treatment facilities in Bucha, Kivertsi, and Zolotonosha demonstrate Ukraine's commitment to enhancing water infrastructure. Many of these projects are in collaboration with international partners, including the European Investment Bank, reflecting strong support from the global community.

- Ukraine is at the early stages of adopting green technologies for water and wastewater management. While the legislative framework is still developing, the market remains open to the introduction of sustainable solutions. The recent adoption of the Law on Wastewater Management and Treatment marks a foundational step, though implementation remains challenging under current conditions. This shift towards sustainable practices signifies a promising outlook for Ukraine's water sector, aligned with long-term environmental resilience goals.

***“While Ukraine has only just embarked on the path toward green technologies in water supply and wastewater management, the commitment to sustainable development is clear. With continued support and innovation, Ukraine's water sector has the potential to become a model of resilience and environmental stewardship, even in the face of unprecedented challenges.”***



**Mr. Siegfried Balleis (Prof.)**  
Former Mayor, Erlangen Municipality

**Mr. Stefan Engelhardt**  
Head of the Department, Erlangen Municipality

*Best practice in sewage treatment plant operations in Erlangen*

*“I served as the mayor of the Erlangen Municipality until 2014. During my tenure, we recognized the critical need to modernize our treatment facilities to meet growing environmental standards and community needs. It was at that time that we began a comprehensive plan to upgrade our wastewater treatment infrastructure, focusing on sustainability and energy efficiency. This modernization aimed not only to improve water quality but also to enhance the resilience of our facilities to support the city’s long-term environmental goals.”*

- The Erlangen sewage treatment plant stands as one of Europe’s most modern facilities, demonstrating significant advancements in energy efficiency, resource optimization, and regulatory compliance. After two decades of strategic modernization, the plant exemplifies sustainable wastewater management through the following key achievements:
  - **Modernization and Scale:** Over €120 million has been invested over the past 20 years to modernize the Erlangen sewage treatment plant, which serves a population equivalent of 350,000 and handles a combined sewage discharge of 1845 l/s, making it one of the largest facilities in Bavaria.
  - **Energy Efficiency and Self-Sufficiency:** The plant has reduced electricity consumption from 8 million kWh to 5 million kWh, achieving 100% energy self-sufficiency by using sewage gas from sludge digestion and capturing 60,000 m<sup>3</sup> of methane annually, contributing significantly to climate protection.
  - **Advanced Processes and EU Compliance:** The plant has implemented a first stage of phosphorus removal to comply with the EU Sewage Sludge Directive (Directive 86/278/EEC), with a second stage underway. Additionally, photovoltaic systems are being installed to support the energy-intensive fourth purification stage, in line with the EU Urban Waste Water Treatment Directive (Directive 91/271/EEC), which mandates this stage for large plants by December 31, 2035.





## Mr. Karam Koudary

### Project manager on international cooperation, Hamburg Wasser

#### *Best practice in sewage treatment plant operations in Hamburg*

- Hamburg Wasser adopts innovative approaches in water supply and wastewater treatment for the Hamburg metropolitan area. Serving over 2.2 million people, Hamburg Wasser oversees both water supply and wastewater treatment in the Hamburg metropolitan region. The utility manages 16 waterworks to provide high-quality drinking water and operates an extensive drinking water and sewage network spanning approximately 12,000 km.
- Wastewater treatment occurs at a central wastewater treatment plant (WWTP), incorporating mechanical and biological processes, sludge treatment and incineration, along with energy recovery. Key innovations in sludge management include biogas production, advanced drying techniques, and phosphorus recovery.

- Hamburg Wasser prioritizes energy-efficient technologies, such as modern aeration systems and biogas upgrading, with the aim of achieving energy independence. Remarkably, the utility generates approximately 130% of its energy needs annually through a mix of incineration, wind turbines, photovoltaic panels, gas and steam turbines, gas engines, and biomethane production.

*“At Hamburg Wasser we already collaborate globally with partners in Ukraine, Jordan, Tanzania, and South Africa, to promote knowledge exchange and sustainable practices in water and wastewater management. We are committed to continuously innovate, and we are pleased to share our practices with international cooperation partners, contributing to the creation of resilient infrastructure for the future.”*



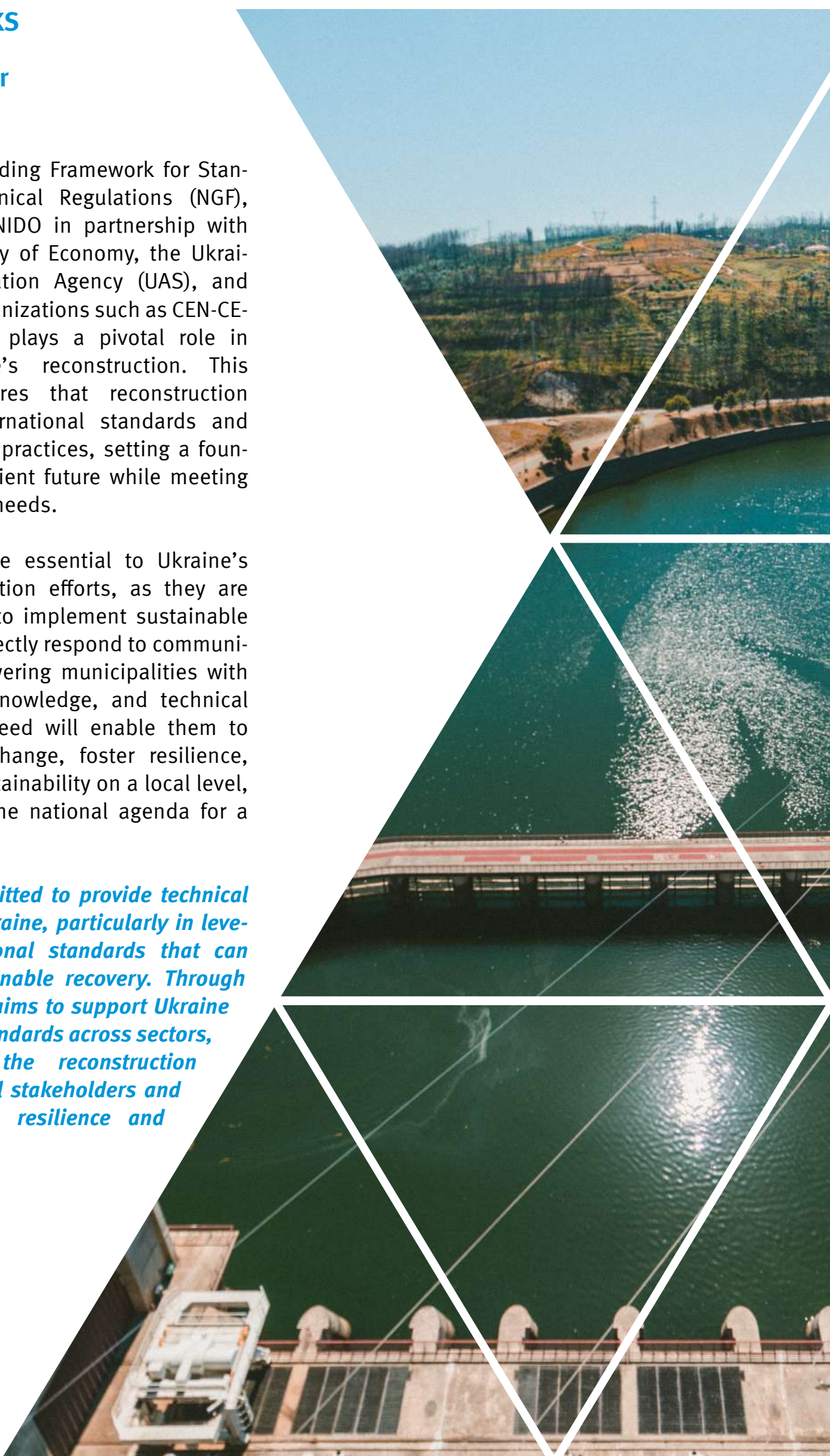
## CLOSING REMARKS

**Mr. Steffen Kaeser**

**Chief, UNIDO**

- The National Guiding Framework for Standards and Technical Regulations (NGF), developed by UNIDO in partnership with Ukraine's Ministry of Economy, the Ukrainian Standardization Agency (UAS), and international organizations such as CEN-CENELEC and BSI, plays a pivotal role in guiding Ukraine's reconstruction. This framework ensures that reconstruction aligns with international standards and sustainable best practices, setting a foundation for a resilient future while meeting today's recovery needs.
- Municipalities are essential to Ukraine's green reconstruction efforts, as they are best positioned to implement sustainable practices that directly respond to community needs. Empowering municipalities with the resources, knowledge, and technical expertise they need will enable them to drive effective change, foster resilience, and promote sustainability on a local level, contributing to the national agenda for a robust recovery.

***“UNIDO is committed to provide technical assistance to Ukraine, particularly in leveraging international standards that can accelerate sustainable recovery. Through the NGF, UNIDO aims to support Ukraine in embedding standards across sectors, ensuring that the reconstruction efforts benefit all stakeholders and foster long-term resilience and sustainability.”***



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