

DEPLOYMENT OF VOLUNTEER ENGINEERS TO THE DANISH RECONSTRUCTION PROGRAM IN MYKOLAIV, UKRAINE

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Deployment of Volunteer Engineers to the Danish Reconstruction Program in Mykolaiv, Ukraine

Summary

Engineers Without Borders Denmark (EWB-DK) is deploying volunteers for the first phase of the reconstruction effort in Mykolaiv, Ukraine (see figure 1). We aim to provide immediate and effective engineering support to address urgent infrastructure challenges, particularly in the areas of water, heating, and electricity.

Mykolaiv sustained significant damage during the Russian assault in 2022, but many refugees and internally displaced persons from Russian-occupied areas have returned during the 2023-2024 period. This influx is placing additional pressure on the city's resources and increasing the need to solve infrastructure challenges.

EWB-DK has conducted an initial fact-finding mission in Mykolaiv and established close cooperation with the Danish Embassy's reconstruction office and other Danish NGOs present.

Our role is simple: We provide volunteer Danish engineering expertise in Mykolaiv for short-term support in technical consulting, upskilling/training, and direct technical assistance. This means we can complement larger humanitarian efforts with sustainable technical solutions and be an active part of Denmark's relationship-building efforts in the city. This initiative is the first in the reconstruction program, where Danish volunteer specialists work directly with Ukrainian authorities and experts.



Figure 1: Map highlighting Mykolaiv, Ukraine, and the russian-occupied area as of 3/10-2024



Figure 2: EWB-DK Response in Mykolaiv, Ukraine

Engineers Without Borders Denmark

Engineers Without Borders Denmark is a technical-humanitarian aid organization supported by its members and volunteer specialists, with a professional secretariat leading the day-to-day operations. We create sustainable solutions and improve living conditions for vulnerable populations worldwide. Our work is based on the needs of local communities and carried out in close collaboration with local partners, where Danish knowledge, technology, and expertise are made available to contribute to new solutions with a focus on environmental, economic, and social sustainability.

For the effort in Ukraine, we are utilizing the EWB-DK Response modality (see figure 3), which is a flexible and reactive framework focusing on short-term missions with high deployment frequency. This approach is designed to quickly respond to urgent needs

and crisis situations, using funding from pre-allocated resources. It enables short-term missions with rapid mobilization of volunteers, ranging from a few weeks up to six months.

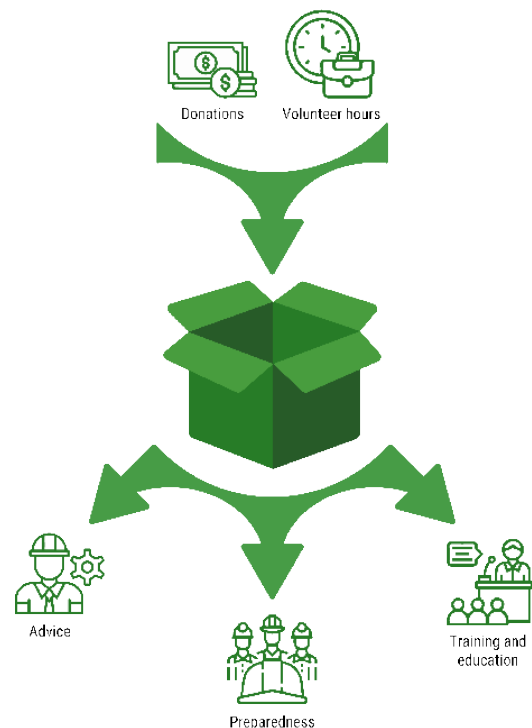


Figure 3: The structure of EWB-DK Response

Purpose

The initiative aims to provide immediate and effective engineering support for the first phase of rebuilding Mykolaiv's critical infrastructure

The effort focuses on three areas: *advice*, *capacity building*, and *direct technical assistance*.

Relevance

EWB-DK's activities in Mykolaiv are aligned with the Ministry of Foreign Affairs' launch of the Mykolaiv-Denmark partnership and the Mykolaiv Concept Masterplan, with focus on the city's reconstruction (see figures 4-5).

During the Russian assaults, many of the city's water, heating, and electricity systems have collapsed, and public utilities are challenged by a lack of workforce. A significant portion of the working-age

Ukrainians are fighting at the front lines and cannot contribute directly to the reconstruction efforts. This has led to frequent breakdowns in the utility systems, keeping the city in a state of crisis and increasing the need for practical support for the civilian population. With winter approaching, it is crucial to repair as much infrastructure as possible to support the approximately 500,000 residents.

Specific challenges



The water supply is destroyed, and the intrusion of saltwater into the city's freshwater systems has caused severe corrosion, resulting in up to 30 leaks per day.



The district heating system is damaged and cannot provide heat to the population during the upcoming winter.



The electrical grid is damaged, and performance has been reduced to 25% of the required capacity.



Figure 4: The Danish Ministry of Foreign Affairs' launch of the Mykolaiv-Denmark partnership
Source: ukraine.um.dk

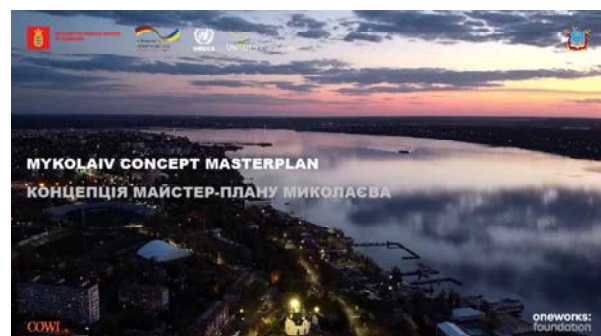


Figure 5: Mykolaiv Concept Masterplan, made by COWI and One Works Foundation



Figure 6: EWB-DK on fact-finding in Mykolaiv



Figure 7: Examples of corrosion in water and heating supply pipes



Figure 8: Discussion of technical challenges in the installation and maintenance of new donations

Target group

The primary target group is the civil society in Mykolaiv, which faces an urgent need for supply stabilization. Given the current damage to the infrastructure, access to basic necessities is critical before winter sets in.

During the attack in 2022, many residents fled the city, causing the population to nearly halve from around 500,000 to under 250,000. Today, it is estimated that approximately 80% of the refugees have returned, and the city also accommodates a large number of internally displaced persons from the occupied eastern Ukraine, which places additional pressure on the city's resources.

EWB-DK works with and through the local administration and utility companies, which will receive technical and practical assistance to restore the current infrastructure damage while also improving future local resilience. The project focuses on targeted training and capacity building for local technicians to manage the maintenance and development of facilities in the long term.

EWB-DK's efforts focus on providing immediate assistance, while also laying the first stepping stones for the long-term reconstruction of Mykolaiv under the "Build Back, Better and Greener" (3BG) concept.

Areas of focus

Mykolaiv's infrastructure primarily consists of older installations, many of which are completely or partially destroyed. The city regularly receives donations of modern equipment that need to be implemented, but the interaction with the existing infrastructure creates challenges. These unique technical challenges are where EWB-DK's volunteer engineers can help solve problems through our three areas of focus:

Advice

EWB-DK's country group for Ukraine consists of volunteer specialists who are regularly deployed to the city. The group provides technical advice and strategic planning support for Mykolaiv's reconstruction efforts in close collaboration with the Danish Embassy's office in Mykolaiv.

Capacity building

EWB-DK's volunteer specialists train and provide education for the local technicians to manage and maintain critical infrastructure and newly donated equipment. Training and knowledge exchange ensure long-term efforts and future local resilience.

Direct technical assistance

EWB-DK offers direct technical assistance and resources for urgent humanitarian tasks, including physical installation, maintenance, and technical assessments for other humanitarian actors.

Local engagement and monitoring

It is crucial for EWB-DK that our activities are tailored to the local context and needs. We ensure this through close collaboration with the Danish Embassy's Reconstruction Office, the Mykolaiv city council, the Governor's Office of Mykolaiv Oblast, DanChurchAid, and the Danish Red Cross. Our partners ensure that EWB-DK's efforts always serve a humanitarian purpose and that we do not substitute or compromise a viable commercial alternative.

Organizational capacity

EWB-DK has a large technical network of 1,400 individual members and strong corporate partners with a solid track record from efforts in Africa, South America, Asia, and Europe. This gives us access to extensive technical expertise, enabling us to address a wide range of complex challenges and deliver effective solutions.

We are experienced in crisis and disaster management and have addressed technical issues in challenging environments for vulnerable communities in over 30 countries for more than 20 years. This includes deployments to disaster areas such as Haiti after the earthquake in 2010, where we provided critical assistance in water, electricity, shelter construction, and healthcare.

Over the years, we have collaborated with and supported the following organizations with technical solutions:

- EU Aid Volunteers
- SOS Children's Villages
- DanChurchAid
- 100% for Children
- World Hope International
- Care4People

Communication

Through our network, we reach over 7,000 recipients interested in our work.

We actively engage our corporate partners and large networks in flexible problem-solving when challenges arise.

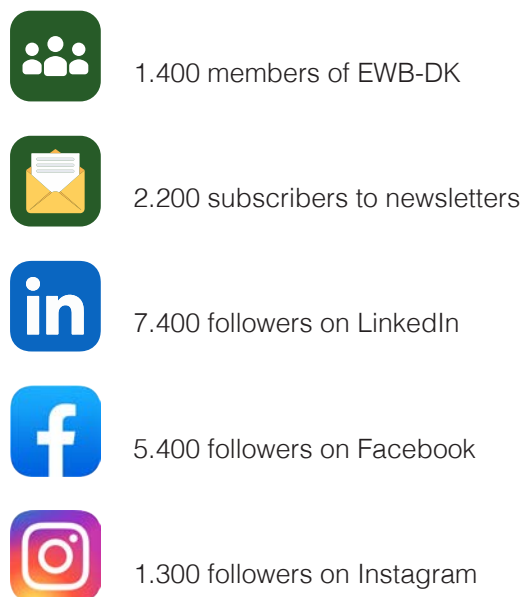


Figure 9: Overview of communication channels and the number of recipients

Danish corporate collaboration

Together with our corporate partners, we regularly organize theme days, after-work seminars, or team-building events where employees and volunteers contribute to solving specific issues from our global initiatives.

A recent example was in August 2024, when we held a team-building event for a Grundfos department, which included virtual troubleshooting of a pump installation in Mykolaiv. During the event, Grundfos technicians provided real-time input on equipment repairs and improvement opportunities through our deployed team on the ground (see figure 10).



Figure 10: Grundfos employees engaged in virtual troubleshooting of a pump installation

Why volunteer in Ukraine?

At EWB-DK, we believe that **ability entails responsibility**. Therefore, it has been a natural choice for us to offer our support for the reconstruction of Ukraine.

As volunteers at EWB-DK, we use our expertise to make a difference for the world's vulnerable populations wherever we can - whether the need for assistance arises from poverty or war.

Whether there is a need for immediate help to secure the most basic necessities, such as clean water and shelter, or for long-term infrastructure development and local capacity building, our volunteer efforts have helped countless communities become self-sufficient again, allowing us to become redundant.

This is also our mission in Ukraine.

"If one has the ability, they should use it in the best way possible to create a better world. I believe that is what drives me. I can see that I am making a contribution, and I take great joy in that."

- Volunteer at EWB-DK



Figure 11: Briefing on the initiative in Ukraine by EWB-DK's mission coordinator Lasse Osadlik

Safety in deployments

To ensure safety in deployments, EWB-DK's mission coordinator is directly linked to the Ukraine initiative. The coordinator ensures that we can always uphold our Duty of Care obligations towards staff and volunteers working outside Denmark's borders. EWB-DK's secretariat, through the mission coordinator, guarantees that we have the necessary resources, training, preparation, deployment, and repatriation procedures for work in risk and conflict areas at all times.

On a daily basis, the mission coordinator supports and advises project groups and missions within the regular project portfolio, but is also deployed as needed as a team leader for missions in the field. This is particularly important during the first mission(s) in new areas, in missions in risk and conflict zones, and during crisis and emergency deployments.

EWB-DK's secretariat continuously monitors the development of the conflict and adapts the activities of the initiative, prioritizing the safety of those deployed above all else.



Figure 12: Map of Ukraine highlighting the russian-occupied area as of 3/10-2024.

Mykolaiv is not assessed to be at risk of attempts to incorporate it into the russian-occupied area

First mission to Mykolaiv

In October 2024, we deployed our first mission to Mykolaiv with 10 EWB-DK members. As part of the mission, we met with representatives from the Mykolaiv City Council and the Danish Embassy's reconstruction office to align on key priorities and identify opportunities for rebuilding.

The mission focused on three main areas:

1. Assessments of the central water supply facility, inspecting its condition and maintenance needs to ensure a stable and reliable water supply.
2. Assessments of the central heating plant, inspecting its condition and maintenance needs to ensure a stable and reliable heat supply.
3. Assessments and strategic planning for the rehabilitation of the National Shipbuilding University with a view to reconstruction and general modernization.

In collaboration with the Danish Red Cross in Ukraine, EWB-DK provided technical advice and support for relief and reconstruction projects under the Danish reconstruction program. The projects included initiatives within water supply, school reconstruction, and the establishment of shelters for kindergartens and nurseries.

We continue our efforts and strive to meet as many needs as possible from our humanitarian partners.



Figure 13: Ukraine team 1 in Mykolaiv



Figure 14: School reconstruction advice in Prybuz'ke

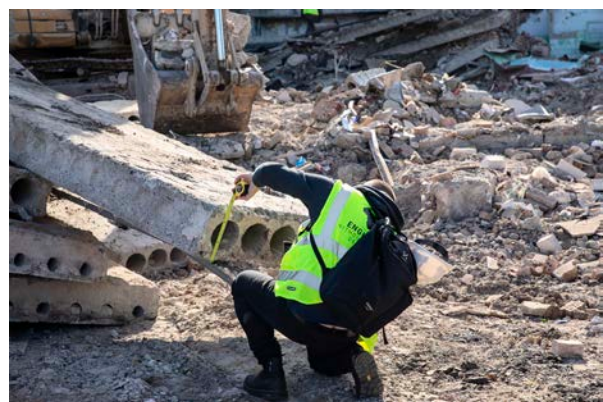


Figure 15: EWB-DK member investigating the reuse potential of deconstructed concrete elements



Figure 16: Destroyed russian vehicles in front of the bombed regional government building in Mykolaiv

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