

## Introduction to PIN Ukraine

PIN has been operational in Ukraine since 2003 and since 2014 has been delivering humanitarian assistance and recovery programming in Luhansk and Donetsk oblasts. Following Russia's invasion in February 2022, PIN leveraged its operations in Kyiv and extensive presence and networks in the east to be one of the first full scale responders. PIN's track record with civil society and government authorities enabled PIN to rapidly expand its humanitarian activities throughout Ukraine's regions, including difficult-to reach communities. PIN operates in close collaboration with civil society and the Government of Ukraine to ensure programming is needs-based and responsive to the evolving needs and priorities.

People In Need Organization (PIN) is a **SAG** (Strategic Advisory Group - WASH cluster) member, and one of most active actors in WASH sector restoring the infrastructure for public services (water, sewage, SWM) in a wide geographical area, including energy infrastructure for public service stations (electricity/gas), PIN is **1 of 15 humanitarian actors** supporting the essential service of district heating throughout Ukraine. PIN **co-leads** the Renewable Energy Technical Working Group under the WASH Cluster and co-chairs the **Energy Coordination Group**, leading the efforts to promote and integrate **backup and renewable energy solutions** (solar, wind, biogas) into the humanitarian and recovery response, while fostering **knowledge exchange and best practice sharing** among partners and actors. In addition, PIN collaborates with a varied group of Ukrainian partners and actors (municipalities, business owners, local authorities, and activists) on promoting green recovery initiatives and scaling up green energy integration into several aspects, like shelter, livelihood, and territorial planning.

This approach is fully aligned with PIN's Global Strategy – Pillar 3: **Climate Change Mitigation**, and supports the objectives of the **National Energy and Climate Plan of Ukraine (2025–2030)**, which targets generating **27% of the country's energy** from renewable sources. It also aligns with the **EU Green Deal**, advancing the transition toward **carbon neutrality** and **zero greenhouse gas emissions** through the gradual shift from fossil fuel dependence to renewable and clean energy systems. Furthermore, the approach reinforces the achievement of the **Sustainable Development Goals (SDGs)**, particularly SDG 7 (Affordable and Clean Energy), SDG 13 (Climate Action), SDG 11 (Sustainable Cities and Communities), SDG 9 (Industry, Innovation and Infrastructure), SDG 6 (Clean Water and Sanitation).

## Background:

In Ukraine, the need to restore access to basic public services remains critical, and the gap between available and required funding continues to widen. According to **RDNA4**<sup>1</sup>, approximately US\$ 0.7 billion in damages occurred between December 2023 and December 2024, bringing the total to US\$ 6.4 billion since February 2022. The **Ministry of Energy (February 2025)** noted that Ukraine lost **10 GW** of generating capacity since the beginning of the invasion. The attacks on energy infrastructure are repetitive and affect the daily life of millions across the country at both household and institutional levels. In **September 2025**, HRMMU<sup>2</sup> reported that, the energy infrastructure of Ukraine was attacked at least 31 times, causing civilian casualties and outages, for example, in October 2025, only in the Shostak



The thermal power plant, following a series of explosions in Kyiv, Ukraine, in October 2025 (CNN)

---

<sup>1</sup> [Rapid Damage and Needs Assessment \(RDNA4\)](#)

<sup>2</sup> The United Nations Human Rights Monitoring Mission in Ukraine

district (Sumy), the city of Shostka and 38 settlements of the community (~ **72,000 people**) lost access to electricity (Shostka Mayor), affecting access to all public supplies and the functionality of vital institutions, later the access to water and energy is restored for few hours a day, while full restore is challenging. The global and local inflation affects the cost of operation and maintenance materials, including energy and fuel for both backup energy and heating, which are essential in the Ukrainian context, this is aligned with limited or shrinking resources for public institutions and facilities, making fuel-based backup energy a more challenging or unaffordable option for essential public institutions and stations

These electricity shortages, coupled with the unreliability of fuel-based backup energy, disrupted the functionality of **vital social institutions**, such as hospitals, schools, IDP collective/transitional centers, elderly care facilities, as well as public infrastructure like water, heating, and sewage stations, interfering with access to public services. Additionally, the impact severely affected the residential conditions of the affected populations, potentially leading to **further displacement**, as households can't survive without such services during harsh winter conditions in Ukraine.

### Current Programming Areas and Opportunities:

#### **1: Backup Energy and Renewable Solutions for Critical Public Services**

Since the onset of the war, repeated attacks on Ukraine's energy infrastructure have resulted in a significant loss of power generation capacity. This led to scheduled power outages and other conservation measures, affecting millions across the country (INSO, 2024). Also, more than **70%** of surveyed WASH utilities reported a lack of backup energy sources (UNICEF, 2024). With rising fuel prices, the **fuel-based backup energy generators have become a burden on the shoulders** of public institutions and facilities rather than helping them overcome the energy outages due attacks or lack of energy generation, while **hybrid backup and renewable energy solutions offer cheaper and feasible solution** for continuity of public institutions/facilities functionality during energy cuts. This aligns with the advocacy led by cluster, Technical Working Groups, and several actors.<sup>3</sup>



PIN Solar Power for Water System in Remote Villages.  
Southern Ukraine (2025)

Under this activity, **PIN** will expand its ongoing efforts to provide backup and renewable energy solutions for essential public services, including **WASH facilities, and other critical public institutions** such as hospitals and IDP facilities. The aim is to ensure **restored and stable access to the essential public services** through provision of backup and renewable energy, all those systems are hybrid and equipped with batteries serve as storage to be used during energy outages, those batteries are chargeable through renewable method (solar power, wind, mixed) and grid.

The system and capacity is tailored to the needs of each targeted facility, ranging from tens of KWs **to 1 MW**, especially for centralized or city-level WASH or district heating stations, **mixed solar and wind energy** solutions equipped with batteries will be considered, offering more stable energy over different seasons, while **biogas** through **wastewater treatment or bio waste digesting** will be considered for electricity and/or heat generation where feasible. This will also serve as **decentralized** energy solutions, **enhancing resilience against attacks on national energy infrastructure**, as public stations/facilities will have their own energy source where needed.

---

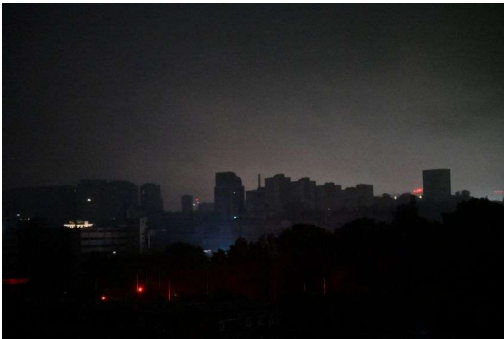
<sup>3</sup> [Advocacy Note for Renewable Energy - WASH Cluster](#)

Where feasible, PIN will leverage the energy plants with extra capacity, **enabling the public institutions to sell or store (then re-use) surplus energy**, which enhances their financial sustainability and transforms them from consumers to **being part of the solution for energy shortage**, being local energy generation points. For example, the majority of surveyed WASH utilities stated that they have land for establishing a solar power plant higher than needed, with a capacity of up to 1 MW in several cases.

This supports a remarkable impact on the environment as it reduces the reliance on fossil-based energy, and aligns with both **national and international** climate- and environment-related policies.

## 2: Community-Level Renewable Energy Solutions.

In response to the **loss of energy generation capacity** and the **repeated attacks on centralized power stations**, which result in widespread electricity outages affecting numerous communities and large populations, **PIN** aims to establish **decentralized renewable energy stations** of up to **1 MW** capacity. These installations will provide an **alternative and resilient energy source** at the community level, meeting electricity needs for both **households/residents and public institutions**, which grants a positive impact on the environment and resilience of the targeted communities, against attacks on centralized infrastructure.



Kyiv during a blackout following Russian drone and missile strikes on October 2025. (CNN)

Renewable energy presents a significant opportunity for expansion in Ukraine, where it currently accounts for only a **small share of total national generation**. The proposed systems will utilize **solar, wind, and biogas technologies**, or **hybrid configurations**, to ensure stable power generation across seasons. **Solar-wind hybrid systems** are already being piloted to balance generation variability, while **biogas** offers strong potential for scaling up, as it is currently representing about **4% of Ukraine's green energy output**.

Biogas solutions will be primarily linked to **wastewater treatment and bio-waste digestion**, addressing **public service challenges** while simultaneously generating energy. Furthermore, PIN will explore **partnerships with the private sector, local businesses, and community groups** to demonstrate the **financial viability and replicability** of these models. Such collaboration will encourage future **investment, innovation, and scaling** of decentralized renewable energy systems across Ukraine.

This is carried out in collaboration with electricity providers, local authorities, and relevant coordination mechanisms, ensuring complementarity and alignment with other's efforts.

## 3: Holistic Approach for Energy Efficiency in Critical Public Facilities

People in Need (PIN) will continue its ongoing initiative, conduct a comprehensive assessment and upgrade of outdated electrical systems and equipment at **critical public institutions and WASH stations**.

PIN aims to support essential public facilities and stations, **improving their function reliability and energy efficiency**, and helping to ensure stable access to essential services for people living in war-affected oblasts.

In most public facilities, electrical and mechanical equipment are very old, **often dating back to the 1970s or 1980s**, and still remains in use today. These systems are typically inefficient, unreliable, and prone to repetitive failures, frequently leading to interruptions in service provision. Their **high energy consumption** places a heavy operational and financial burden on the management of public institutions and utilities, **resulting in unstable access to essential public services and supplies** for the surrounding communities.



PIN Water Supply System Support in Ukraine (2024)

PIN will **replace old and inefficient electrical equipment**, including pumps, electrical control cabins, boilers, and outdated generators, with modern, energy-efficient, and automated systems. This intervention aims to increase **energy efficiency, enhance reliability, reduce operational costs**, and stabilize the delivery of critical services at the community level.

The activity is closely linked and synergized with other interventions under this project, particularly the backup and renewable energy solutions and energy rehabilitation for public services. Together, these complementary efforts will contribute to **greater energy stability and resilient access to essential services** across targeted communities.

#### **Activity 4: Renewable Energy for Livelihood and Community Recovery**

Under this initiative, PIN will support **local innovation projects** that integrate **renewable energy solutions** into community and livelihood recovery. Implemented in collaboration with **municipalities, local NGOs, associations, and private sector partners**, the activity aims to materialize **innovative, feasible, and eco-friendly projects** that combine renewable energy with sustainable public-service and livelihood outcomes. These initiatives will demonstrate how **renewable energy technologies** can contribute simultaneously to **energy resilience, resource efficiency, and economic benefits** at the local level.

##### Sub-Activity 1: Biogas Integration with Smart Agriculture

This component promotes the use of **biogas generated from wastewater treatment** to power **agricultural production**. The treated wastewater will be **reused for irrigation**, while the **biogas will be stored and used for heating greenhouses** during the winter season.

The approach can be scaled from **small household systems<sup>4</sup> to village-level installations**, enhancing circular resource use and promoting local self-sufficiency.

This model—successfully piloted by PIN in other countries—holds strong potential in Ukraine, where **harsh winters and high fuel costs** often prevent farmers from maintaining year-round production. By enabling an **additional winter harvest**, this intervention will help farmers generate **extra income**, reduce operational costs, and **lower greenhouse gas emissions** through eco-friendly energy production. Additionally, the **reuse of treated water** will contribute to **water conservation** and **reduced pressure on wastewater treatment facilities**.

##### Sub-Activity 2: Biogas Generation from Municipal Landfills

This component will support **municipalities managing landfills** to introduce **on-site waste sorting and biogas generation systems**. The captured biogas will be used for **electricity or heat production**, while **bio-waste recycling or bio-production** will be promoted where feasible to maximize environmental and economic benefits.

---

<sup>4</sup> [Wastewater treatment small units - sample](#)



Several municipalities have already conducted **feasibility assessments** for such initiatives and possess preliminary infrastructure,<sup>5</sup> making this activity a timely opportunity to demonstrate scalable models of **decentralized waste-to-energy/production solutions** that combine **climate action, sustainable waste management, circular economy/recycling, and local energy generation**. In addition, this will help municipalities enhance their financial sustainability, which may be reflected in the quality of public service they provide.

### **Renewable Energy Solutions in Housing and Shelter**

PIN aims to collaborate with **several Ukrainian companies active in geothermal energy** to implement geothermal heating systems at the household level. The objective is to demonstrate the feasibility and long-term benefits of geothermal-based heating in the Ukrainian context and to encourage replication and scaling of such systems by local actors and communities.

**Heating represents one of the most critical needs for households in Ukraine**, particularly in the coldest oblasts such as Sumy and Kharkiv, where temperatures drop significantly during winter months. **The financial burden of conventional heating remains high for vulnerable families, often consuming a substantial portion of household income.** Introducing renewable, clean, and low-maintenance geothermal solutions can therefore play a vital role in enhancing community resilience against attacks on energy and heating infrastructure and reducing dependence on fossil-based or centralized energy sources.

While the initial installation of geothermal systems requires a significant investment, the cost is justified by the **systems' long operational lifespan, minimal maintenance requirements, and their ability to provide consistent, eco-friendly heat.** This approach not only supports climate adaptation and decarbonization goals but also enhances energy security, contributing to sustainability and improved living conditions for war-affected populations.

### **Additional PIN Added Value**

- **Seasoned local partners with experience:** Collaborations with EcoClub, Ecoaction, and New Way bring specialized local expertise in renewable energy, climate policy, and green WASH solutions.
- **Expert knowledge in country:** PIN's country office houses a robust team of civil engineers, energy specialists, and WASH experts who have worked in frontline and de-occupied areas since 2014, ensuring technically sound and contextually appropriate interventions.
- **Global Technical Advisors:** PIN's global Knowledge, Learning, and Development (KLD) network of technical advisors provide technical expertise and facilitate knowledge sharing between the country program and external stakeholders and sectoral platforms.



Solar power plant for water station in another CP

---

<sup>5</sup> [Creation of a composting cluster of the Voznesensk territorial community](#)