

# UKRAINE: SCENARIOS



For the cold season 2025–2026





## OVERVIEW

This report provides an anticipatory analysis of the humanitarian situation in Ukraine during the upcoming October 2025 to March 2026 cold season. It presents four plausible scenarios that examine the intersection of two high-uncertainty, high-impact factors for humanitarian conditions during the cold season: the extent of Russian attacks damaging energy infrastructure and the severity of cold season conditions. The purpose of this report is to support humanitarian responders refining their winterisation strategies and preparedness measures, focusing particularly on ensuring access to heating, shelter, and other life-saving needs to account for different possible scenarios.

This short-term analysis complements the broader scenarios report published in March 2025, which addressed the national and subnational war dynamics through December 2025. While the March scenarios remain relevant for long-term planning, this report narrows the focus to seasonal dynamics and operational constraints that could significantly affect the humanitarian response during the cold months, helping humanitarian responders stress-test plans against different but plausible conditions.

## ABOUT THE REPORT

### Aim

This report details four distinct yet plausible futures for Ukraine during the upcoming October 2025 to March 2026 cold season. The scenarios focus on how the intersection of war dynamics and seasonal conditions may drive distinct cold-season-related needs throughout the country with a goal to inform the humanitarian response's winterisation preparations for the 2025–2026 cold season, particularly preparedness measures related to heating, adequate shelter, and access to other life-saving needs.

### Methodology

ACAPS published scenarios for Ukraine in March 2025, using the chain of plausibility approach outlined in our [guidance note](#) to cover potential nationwide developments and their subnational implications through December 2025. The scenarios in this report serve as an update to the earlier scenarios, as attacks damaging energy infrastructure and cold season conditions present unique short-term risks not captured in the longer-term scenarios. This report focuses exclusively on the contextual factors that would affect specific humanitarian needs during the upcoming cold season.

To develop these scenarios, ACAPS used the two axes approach (also known as the 2x2 matrix technique or key factors analysis), which generates relevant scenarios by placing two high-impact, high-uncertainty factors that influence the future of the issue under study – in this case, the number of Russia's attacks damaging energy infrastructure and the severity of the cold season – on two axes that cross to form four distinct scenarios. This matrix is illustrated on page 8. ACAPS also conducted a secondary data review and eight key informant interviews with cluster representatives, international and national NGOs, and civic authorities, which informed the development of the scenarios and their humanitarian implications.

The scenarios are described in order of both likelihood and impact combined. Each axis – high number of Russian attacks damaging energy infrastructure, low number of Russian attacks damaging energy infrastructure, severe cold season, and mild cold season – is assessed in terms of likelihood (very low to very high) and impact (very low to major). The aggregate of these scores for each scenario determines the order in which they are presented in this report.

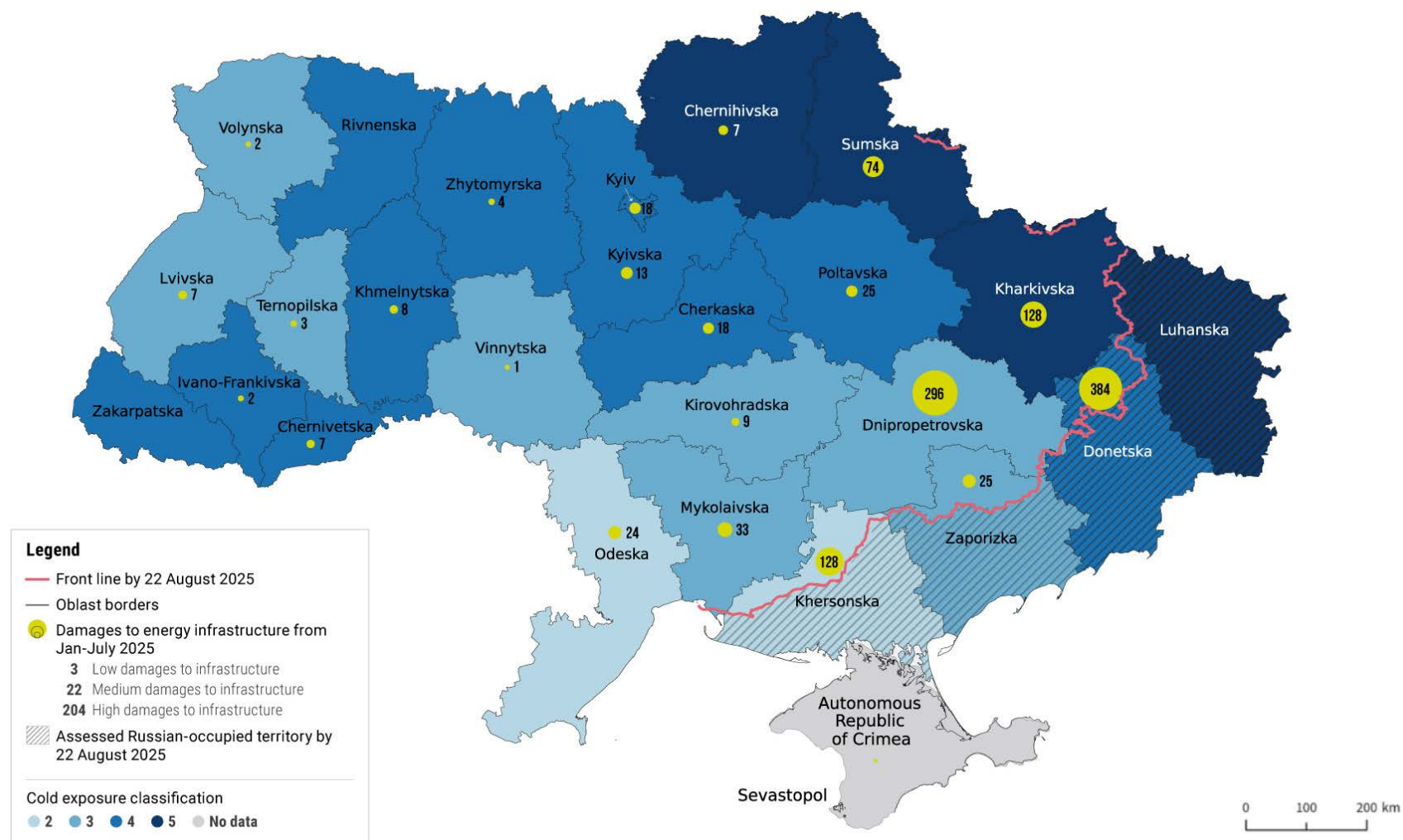
### Limitations

Scenarios are not forecasts or predictions of the future but frameworks for exploring possible futures and their impact on humanitarian needs and operations. For this reason, we do not consider all possible scenarios for the upcoming cold season in Ukraine and instead focus on plausible ones that are most useful for humanitarian decision makers.

The analysis also has limits related to data and information gaps, including uncertainty around Russian aerial attack trends, as the intended target is not always known or certain; limitations with long-range seasonal forecasting that make it difficult to accurately predict conditions for the upcoming cold season in advance (which necessitates the inclusion of both a mild and severe cold season in the scenarios); and sensitivities in Ukraine around energy sector information, which limits publicly available and consolidated information for analysing the energy situation (DiXi Group 04/14/2025).

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**FIGURE 1. DAMAGES TO ENERGY INFRASTRUCTURE AND COLD EXPOSURE BY OBLAST**

Source: ACAPS accessed 12/08/2025 and using data from WHO (26/09/2024); ISW (accessed 22/08/2025)

Note: There are no oblasts with a cold exposure classification of 1. Based on WHO's analysis of cold exposure, no oblasts scored a mean of 1, meaning all oblasts analysed scored a mean of 2 or higher. Because the exact coordinates of damages are not always known, to account for damages recorded in Russian-occupied territory, ACAPS excluded raions that are more than 50% occupied by Russian forces from the data analysis on damages, following the approach used in REACH's Cold Spot Analysis.

## INTRODUCTION AND KEY FACTORS

This report outlines four scenarios for how the upcoming October 2025 to March 2026 cold season may shape humanitarian needs and operational constraints across Ukraine. It is intended to support winterisation preparations by anticipating how contextual dynamics will evolve and contribute to cold-weather risks for affected people. These scenarios aim to help humanitarian responders stress-test winterisation plans under different but plausible conditions during the coming cold season.

The cold season scenarios provide an update to the scenarios that ACAPS published in March 2025, which cover the period until 31 December 2025: continued war without resolution, reduction of hostilities, and escalating war. While those scenarios remain relevant for the longer-term outlook, this update narrows the focus to two main high-impact, high-uncertainty factors that will shape humanitarian needs during the coming cold season in Ukraine: the number of Russian attacks damaging Ukraine's energy infrastructure and the severity of cold season conditions. These factors and their interactions directly determine people's access to heating, shelter, and other services critical for survival during cold weather, regardless of which of the macro-level scenarios published in March 2025 play out. Severe cold increases the demand for electricity and heating, the provision of which is affected by continued Russian attacks damaging Ukraine's energy infrastructure. Inadequate shelter – compounded by war-related damage to housing – also affects people's exposure to cold as well as demand for services reliant on energy provision, such as water and healthcare.

Additional contextual factors, such as domestic economic conditions, are considered as part of the implications of each scenario because they interact with localised vulnerabilities such as housing damage and internal displacement. Other factors, such as the continuation of international assistance to Ukraine and diplomatic efforts, are treated extensively in the March 2025 scenarios to focus narrowly on immediate seasonal risks and operational relevance in this report.

### Defining key factors

Because the report assesses two high-impact, high-uncertainty variables against each other, ACAPS defines clear thresholds for each variable to understand which scenario may unfold.

#### Russian attacks damaging Ukraine's energy infrastructure

Because of the unpredictable nature of war developments and their impacts on Ukraine's energy grid, ACAPS analysed its [Ukraine Damages Dataset](#) to determine thresholds based on historical data about recorded damages to energy infrastructure in Ukrainian-controlled territory. This factor can be defined as:

- high (26% or more) increase in the number of Russian attacks damaging energy infrastructure; or
- low (0–25%) increase in the number of Russian attacks damaging energy infrastructure.

The number of damages is aggregated over the entire cold season and then measured in comparison to damages recorded in the preceding warm season. The same threshold applies on a month-to-month comparison. In assessing the potential impact of energy infrastructure attacks during the upcoming cold season of 2025–2026, it is important to recognise that Ukraine may retain a baseline capacity to manage even high levels of physical damage, as it did during the 2024–2025 season. This resilience is not solely attributable to air defence capabilities, which are already reflected in damage estimates, but also to a broader set of national mitigation measures, including rapid repair capacity, strategic electricity and gas imports, and other emergency response mechanisms. By using the number of damages to energy infrastructure instead of the number of attacks, Ukraine's air defence capabilities have already been factored into the calculation. For the purposes of scenario analysis, this systemic resilience is treated as a critical baseline assumption. Detailed information on Ukraine's mitigation planning and implementation remains classified, however, so specific and granular data is not available for verification or publication.

#### Cold season severity

Because accurately predicting the exact severity of the cold season this far in advance is impossible, this report considers the possibility of both mild and severe cold seasons. Using the WHO threshold for cold weather temperatures in Ukraine, the cold season is classified as either:

- mild, with sustained temperatures at or above  $-10^{\circ}\text{C}$  between October 2025 and March 2026; or
- severe, with average temperatures below  $-10^{\circ}\text{C}$  during that same period.

## Russian attacks on Ukraine's energy infrastructure

### Power and heating in Ukraine

Ukraine's energy grid – and the provision of power and heat – depends on a highly interconnected system where electricity and natural gas together power homes, businesses, and public infrastructure. This interconnectedness becomes especially critical in the cold season, when disruptions to either the electric grid or gas supply can affect both power and heat availability. Most electricity is generated by nuclear power – though supplemented by thermal (coal and gas) power, hydropower, and renewable sources such as solar and wind – while natural gas is used as a direct heating source, both in large cities with district heating and in smaller towns and individual homes (ACAPS 13/09/2024).

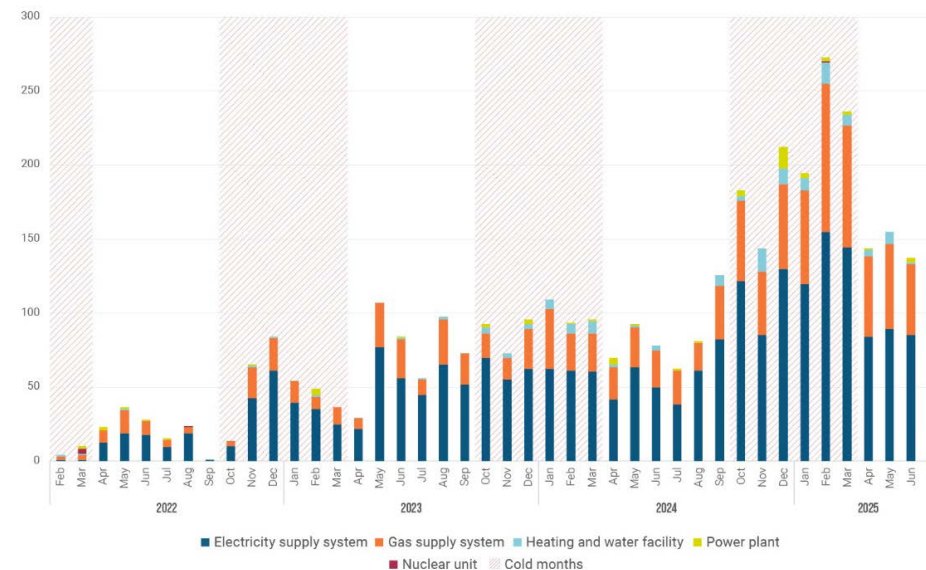
In general, families heat their homes in four main ways:

- **District heating:** most common in large cities, where centralised systems such as combined heat and power plants are powered mostly by natural gas but rely on electricity to operate.
- **Individual gas boilers:** common in individual homes and small buildings, they use gas for heat but require electricity to function.
- **Electric heating:** these items fully rely on electricity and are often used as a backup or in areas without gas access.
- **Solid fuel:** these burners or stoves are independent of the energy grid but depend on firewood, coal, or other solid fuels.

Electricity, beyond its role as a power source, is essential for enabling heating – even in predominantly gas-heated homes. Power disruptions can immediately affect heating even if gas supply remains intact; for example, power outages prevent gas boilers from circulating hot water, and district heating systems may fail if pumping stations or control systems lose power (REACH 18/09/2024). Conversely, gas supply interruptions can leave entire neighbourhoods without heat, forcing a reliance on electric heating, which further stresses the electric grid. Given these cascading risks, winterisation planning must consider not only whether families are connected to gas or electricity but also the resilience of their heating systems to interruptions in either or both supplies.

This two-way dependency means attacks damaging energy infrastructure can cascade through both systems, amplifying the risk of widespread heating loss. Families reliant solely on centralised services are particularly vulnerable to interruptions, especially in urban areas prone to attacks. Those with alternative heating methods, such as solid fuel stoves, may better withstand disruptions – provided they have access to solid fuel sources.

Figure 2. Monthly reported damage incidents to energy infrastructure in Ukraine since the start of the full-scale invasion



Source: ACAPS accessed 12/08/2025

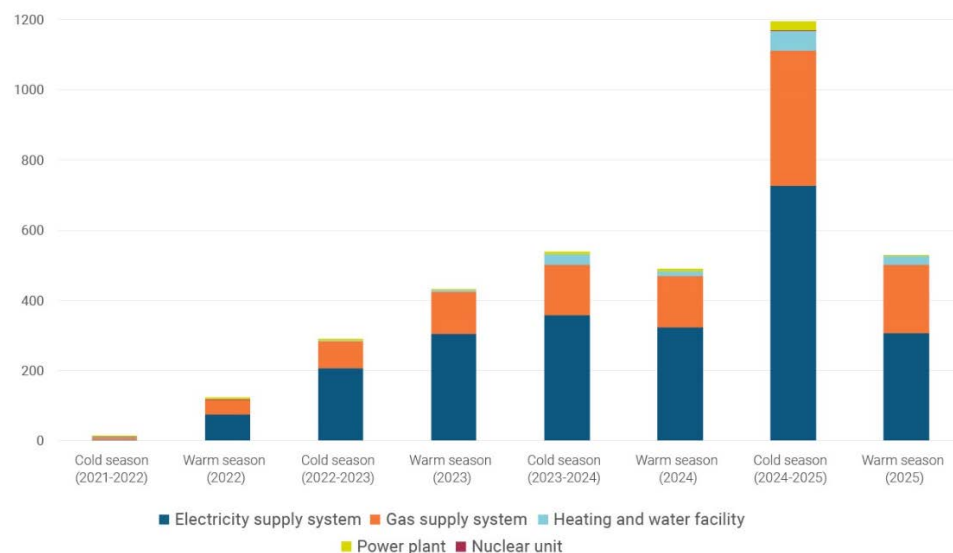
Note: Data only covers incidents through July 2025, as monthly data for August 2025 is incomplete at the time of writing. Information gaps on damage events limit the analysis, as not all damage incidents are reported because of data sensitivity or challenges corroborating some reports. The Damages Dataset Codebook contains more information about how infrastructure is categorised and defined.

The Russian military has targeted Ukraine's energy infrastructure since the start of the full-scale invasion, with the resulting damage leading to cascading effects on the provision of power and heating and services reliant on them, such as water supply, health facilities, and IDP centres and collective sites – particularly during the cold season when energy demand peaks. Ukraine's energy sector is adapting to the threat of Russian attacks, including by continuing repairs to damaged energy infrastructure while also adding new power capacity and small-scale off-grid generation; decentralising the energy grid by 2030 and integrating into the European energy market; developing countermeasures such as metal netting and protective concrete structures around energy facilities, as well as planning new substations and power plants underground; and importing and exporting electricity and gas supplies, primarily from neighbouring European countries (Interfax 31/03/2025; Govt. Ukraine 24/04/2025; IEA 17/12/2024; USAID/DiXi Group Group accessed 24/08/2025; The New Voice of Ukraine 11/01/2025). Ukrainian authorities have also implemented mitigation and coping strategies during the



cold season, such as power curtailment measures and energy conservation calls, while international support, including the provision of equipment and funding for emergency repairs and gas and electricity supplies through the Ukraine Energy Support Fund, has assisted Ukraine's efforts to stabilise the energy situation and meet most demand in Ukrainian-controlled areas during previous cold seasons.

**Figure 3. Aggregated seasonal damage incidents to energy infrastructure in Ukraine since the start of the full-scale invasion**



Source: ACAPS accessed 12/08/2025

Note: Data only covers incidents through July 2025, as monthly data for August 2025 is incomplete (see the note for Figure 2). The warm season includes April–September for each year, except 2025, as complete seasonal data is not yet available at the time of writing.

The extent of Russian attacks damaging infrastructure remains a key uncertainty and major threat to Ukraine's energy resilience going forward, raising the risk of both planned and unplanned outages and energy service disruptions during severe cold spells when the demand for power and heating is higher. Already, the number of damages to energy infrastructure in the first seven months of 2025 (1,206) are nearly equal to the total recorded for all of 2024

(1,295), with the most damages recorded in frontline oblasts that are also most susceptible to cold weather hazards.<sup>1</sup> Because of this, areas affected by war and cold are likely to be more vulnerable to energy provision gaps during the coming cold season, though the overall lack of coping capacity concentrated along the front lines exposes southern oblasts to risks during the cold season as well (ACLED accessed 12/08/2024; REACH 10/06/2025). Total damages this warm season (530) are already outpacing last year's (490) with two months remaining in the season, highlighting the risk that Ukraine's energy infrastructure could sustain higher-than-ever war-related damages in the coming months, which could potentially lead to planned and unscheduled outages or energy rationing to manage demands on the energy grid as the weather gets colder.

While electricity supply systems remain the most vulnerable to attacks, Ukraine's gas infrastructure has also become increasingly vulnerable since late 2024. Russian attacks damaging Ukraine's natural gas production and storage infrastructure throughout 2025 – particularly in Donetsk, Dnipropetrovska, Kharkivska, Khersonska, and Sumska oblasts – as well as reduced domestic production and historically low gas reserves, could hinder natural gas provision in the coming months. Ukraine already relies heavily on gas imports to cover a roughly six billion cubic metre deficit in gas reserves (of the projected 13 billion cubic metres required for uninterrupted heating), and continued attacks – such as those on facilities used to deliver gas imports – could make it difficult for Ukraine to import enough gas to meet the country's needs (OSW 02/04/2025; S&P Global 19/03/2025; RBC 19/06/2025; Reuters 06/08/2025). This will potentially affect people's ability to heat their homes during cold weather conditions, particularly for those in frontline oblasts and urban areas dependent on centralised gas heating (KII 16/07/2025; KII 25/07/2025 b).

The notable escalation in the number of drones launched during aerial attacks in 2025 also presents a major risk in terms of Russia's capacity to damage energy infrastructure in the coming months (Kyiv Independent 02/08/2025). Russia is stepping up its production of drones, reportedly reaching a daily production rate of 170 Shahed and decoy drones per day. Its modifications of such munitions, such as the type and increased payload of warheads on Shahed drones, potentially allow it to bypass or overwhelm Ukrainian air defences and other countermeasures. Decoy drones can also draw attention away from primary targets, overwhelming or confusing air defence systems, while reconnaissance drones – which are used to gather intelligence on the location and vulnerability of targets – help direct future attacks more precisely. These factors further raise the risk of heavy damage to energy infrastructure, particularly if Ukraine faces delays or shortages in air defence capacities and the energy sector struggles to conduct repairs quickly enough to keep pace with the extent of attacks and damage (Ukrainska Pravda 04/06/2025; The Telegraph 27/05/2025).

<sup>1</sup> Oblasts that recorded the highest cumulative damages to infrastructure through July 2025 include Donetsk oblast (384); Dnipropetrovska oblast (296); Kharkivska and Khersonska oblasts (128); and Sumska oblast (74). Both WHO's 2024–2025 Winter Risk Assessment and REACH's Cold Spot Index shows that of these oblasts, Donetsk, Kharkivska, and Sumska oblasts – which are also frontline areas – are among those that face the highest cold-season-related natural hazard.

While Ukraine's energy sector has demonstrated resilience in the face of risks from Russian aerial attacks, warmer-than-average cold season conditions since the full-scale invasion began – and resulting lower overall demand for energy provision – have also likely helped mitigate the situation. Ukraine's resilience has not been proven under harsher cold season conditions, presenting a major risk should severe cold materialise in the coming months – particularly if the energy sector faces intensified attacks and surging demand during severely cold periods. Russian cyberattacks on energy transmission systems and service facilities also remain a risk, as they cause physical disruptions to energy services and lead to challenges and delays in responding to and repairing energy systems. As cyberattacks often intentionally coincide with aerial attacks or during peak energy demand, repair crews could face difficulties in assessing damage in real time or coordinating effective repairs, further compounding the stress on these systems during peak periods.

### Cold weather conditions

Ukraine's cold season typically runs from October–March of the following year, with the provision of heating typically beginning in late October or early November, depending on weather conditions and decisions on starting heating at the oblast level. Cold weather conditions could last through mid-April. During this season, the climate in Ukraine is typically characterised by prolonged sub-zero temperatures, particularly from December–February. While the whole country can be exposed to severe cold, the central, eastern, and northern oblasts typically experience the highest cold weather hazard levels in the country (REACH 10/06/2025; WHO 26/09/2024). Ukraine has experienced relatively mild cold seasons in recent years, however, with no climatic winter<sup>2</sup> recorded since 2022 and the average temperature closer to spring or autumn conditions. In other words, average temperatures did not fall below 0° C (Ukrinform 20/01/2025).

While the typical and prolonged low temperatures associated with Ukraine's cold season have generally been absent during these milder cold seasons, severe cold – whether sustained or as shorter cold snaps during overall milder conditions – is possible this coming cold season, though it is too early for accurate forecasts, which are available in October at the earliest. Severe cold is characterised by temperatures below –10° C, with the number of frost days ranging from 90–110 since 2020 (WB accessed 25/08/2025). Eastern and northern oblasts can experience cold as severe as –15° to –25° C, including some that are most affected by both war and damage to energy infrastructure (see Footnote 1). In spite of a relatively mild cold season during 2024–2025, scheduled outages – though less severe in duration and scope than anticipated – were implemented in December 2024 and during the February 2025 cold snap.

In colder months, severe temperatures can increase energy demand – with some estimates that the energy grid is unable to meet significant needs below –4° C – adding pressure on energy systems weakened by existing damage and vulnerable to continued attacks (Kyiv Independent 31/01/2025). Energy disruptions can then increase people's exposure to severe cold, particularly for those who face other war-related impacts, such as housing damage. For example, cold season temperatures pose risks for people in damaged houses – a persistent risk in frontline areas – or temporary shelters, where heating is often unreliable. People are then exposed to severe weather elements and respiratory illnesses, particularly if attacks occur during the night and early morning hours when temperatures are lowest and the load on heating systems peaks. This intersection is particularly acute in Donetsk, Kharkiv, and Sumska oblasts, which have sustained some of the highest levels of war-related housing and energy infrastructure damage and face some of the highest natural hazard exposure in the country during the cold season. That said, even southern oblasts that experience warmer cold season temperatures, such as Kherson, Mykolaiv, and Zaporizhzhia oblasts, have faced extensive damage to energy infrastructure and lack sufficient coping capacity during the cold season (REACH 10/06/2025; WHO 26/09/2024; WB 28/02/2025). IDPs, older people, people with chronic respiratory and cardiac conditions, children, and those in institutional settings (such as care facilities) are most vulnerable to disruptions and cold exposure.

People in urban and rural areas face distinct challenges in accessing alternative heating sources during the cold season. People in rural areas, with lower incomes and a higher reliance on individual heating systems, are better able to access off-grid solutions such as solid fuels (e.g., firewood, briquettes, and pellets), which are less accessible in urban areas, which depend more on electric and gas heaters. Access to solid fuels, particularly in rural frontline areas, is complicated by insecurity, unexploded ordnance (particularly if hidden by snow or ice), and supply chain disruptions from damaged roads and logistical barriers (IOM 22/05/2025; KII 16/07/2025). Solid fuels and generators are also often unaffordable and carry health risks, such as poisoning and fire hazards (REACH 10/06/2025; KII 22/07/2025 a; KII 25/07/2025 a). At the same time, urban frontline areas – where there is a dense concentration of damaged housing and central heating systems are offline or energy systems continue to be targeted – challenges in accessing alternative heating sources pose a significant risk and are undermined by power outages. Families can employ coping capacities such as heat rationing, but these begin to fail in severe cold conditions, while unsafe coping measures – such as improvised heating – can lead to health risks and even fires.

Fluctuations in utility prices and fuel availability could worsen energy insecurity during the coming cold season, particularly for rural communities, renters, and IDPs. While the national average utility expenditure accounts for roughly 20% (around 3,000 UAH or 73 USD) of the

<sup>2</sup> Climatic winter in Ukraine refers to the onset of sustained average daily air temperatures below 0° C. For the past three winters, the average air temperature for the cold season was higher than 0° C (Ministry of Environmental Protection and Natural Resources of Ukraine Facebook 19/01/2025).

median income, rural families – despite reporting lower monthly bills (often under UAH 1,500) than those in urban areas (1,501–5,000 UAH or 36–121 USD) – spend up to a quarter of their incomes on utilities because of their lower earnings, making them more susceptible to seasonal price shocks (IOM 22/05/2025). These groups also spend and rely more heavily on firewood, the cost of which has been rising steadily since April, threatening families' coping capacities if prices remain elevated (JMMI accessed 25/08/2025). Although the June 2025 Joint Market Monitoring Initiative reported heating fuels as widely available, localised shortages of vehicle fuels in areas such as Chernihivska, Donetska, Mykolaivska, and Zaporizka oblasts suggest potential distribution challenges before the cold season. This convergence of rising costs, constrained access, and limited financial resilience indicates a heightened risk of inadequate heating, particularly for those already at the margins of affordability.

Delays in repairs and gaps in service provision also contribute to these impacts. Severe weather events could disrupt humanitarian operations, for example, because transport routes could become inaccessible or inoperable, particularly in frontline areas where war has damaged roads and bridges and security concerns on main roads necessitate diversions (KII 16/07/2025). Alternative routes, if accessible, could increase delivery times and fuel consumption for humanitarian responders if they cover longer distances on such routes, especially as they usually rely on secondary or agricultural roads, which are more likely to become difficult to use for heavier vehicles in colder weather (KII 19/08/2025).

## SCENARIOS AND HUMANITARIAN IMPLICATIONS

To inform and support winterisation preparations, the scenarios below consider how the two main factors during the cold season – the number of Russian attacks damaging Ukraine's energy infrastructure and cold season conditions – can intersect to create compounding risks for people, including access to heating, adequate shelter, and other basic services. The implications are not uniform across the scenarios, with oblasts experiencing unique sets of variables that overlap with existing vulnerabilities, including the two factors under consideration.

Figure 4 summarises the key factor analysis used to develop the scenarios and their humanitarian implications, which are detailed below. The scenarios are ordered in terms of both their likelihood and impact; the methodology note outlines this process further.

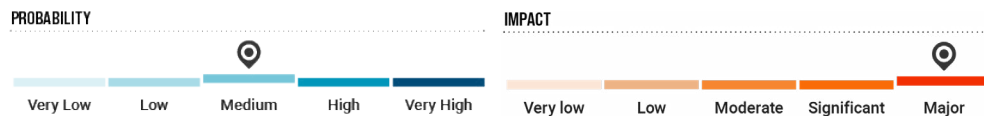
Figure 4. Two-factor matrix to develop scenarios





## SCENARIOS

# 1: High number of attacks damaging energy infrastructure + severe cold season



This scenario presents the most severe combination of risks as Russian forces intensify missile, drone, and artillery attacks across frontline and urban areas and diplomacy fails to reach any resolution. Repeated strikes on and damages to power supply systems and combined heat and power plants degrade Ukraine's capacity to generate, transmit, and distribute electricity, creating knock-on impacts on gas services and cascading effects on heating services in both urban and rural areas, particularly densely populated cities, including Kyiv, Kharkiv, Odesa, and Zaporizhzhia. At the same time, oblasts across central, eastern, and northern Ukraine also face sustained attacks and rising damages to power and gas infrastructure.<sup>3</sup> Repair crews also face increasing safety threats, conscription, and access constraints from severe weather, which limit the energy sector's ability to conduct quick repairs and keep up with the pace and scale of damage to energy facilities – leading to longer scheduled outages and more frequent unscheduled power outages, on average between 12–20 hours but in some cases even longer, across the country and more widespread gaps in heating and power.

Simultaneously, the cold season brings severe temperatures across the country. With frozen ground conditions in northern and eastern Ukraine enabling movement, Russian forces also continue ground operations, with fighting in Donetsk oblast the most intense, while limited operations continue in Kharkivska and Sumska oblasts – though snow and frost conditions limit the pace of front line advances overall. People in central and northern oblasts are exposed to the coldest temperatures and will have compounding needs related to energy infrastructure damage and security risks for aid and repair as war continues. At the same time, people in Dnipropetrovska, Khersonska, and Mykolaivska oblasts – as well as those in western Ukraine – find their coping capacities stretched by damage to power supply systems (though Khersonska oblast also faces intense damage to gas supply systems) despite facing less severe temperatures than central and northern regions. Amid these conditions, energy demand across the country surges beyond the demand on milder cold season days while the energy sector struggles to restore services quickly.

## Impact on humanitarian needs

Energy demand surges as a result of sustained and widespread attacks damaging energy infrastructure during a severe and prolonged cold season. Repeated strikes, particularly on infrastructure around major population centres such as Kharkiv, Kyiv, Odesa, and Zaporizhzhia, drive power and heating outages for large numbers of people for more than 12 hours daily, with some areas experiencing days-long outages. Slow repair rates cause longer planned outages and frequent unscheduled outages, leaving large swaths of the population without reliable heating or power – particularly in major urban centres such as Kyiv, Kharkiv, Odesa, and Zaporizhzhia that are reliant on district heating.

Families in multi-storey buildings reliant on damaged district heating systems are at most risk, as power outages also limit people's ability to use electric heating devices. In rural areas, communities relying on solid fuel face a spike in demand, and price increases and market dysfunction – driven by transport delays, low local stock, and limited vendors – also hinder access. While localised fuel shortages occur, the key pressure point remains affordability, with solid fuel and petrol prices rising steeply in frontline and rural areas. Fuel and energy costs – driven by surging demand and supply chain constraints – force rural families to reprioritise spending, with some diverting resources away from food and healthcare.

With more than 3.34 million people displaced across Ukraine – including more than 417,000 in Kharkivska oblast, 396,000 in Dnipropetrovska oblast, and 290,000 in Kyiv city – and living in temporary or rental housing, IDPs also face affordability and access challenges (IOM Frontline Situational Monitoring 19/08/2025). Displaced people in collective centres and urban shelters are further stressed, with facilities facing inadequate heating infrastructure, unreliable electricity, and limited insulation. Attacks, coupled with extreme cold, lead to new displacements from frontline areas and put further pressure on host sites already struggling to maintain capacities for IDPs.

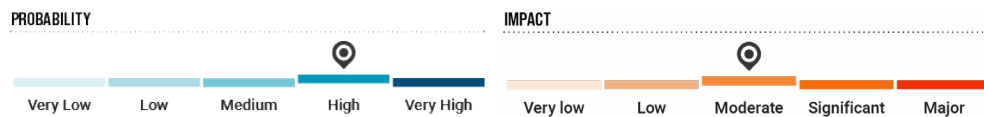
Health facilities in frontline oblasts experience outages lasting more than 12 hours, severely disrupting essential services including surgery, neonatal care, oxygen provision, dialysis, and cold-chain-dependent vaccine and medicine storage as backup power sources are unable to provide enough supply. Fuel scarcity and impassable roads, particularly in areas such as Donetsk, Kharkivska, and Sumska oblasts, limit transport to and from medical facilities, further hindering people's access to healthcare. Cold-related morbidities increase, especially among children under five and older people. Fire hazards and carbon monoxide poisoning incidents rise as families turn to unsafe heating methods amid severe cold weather.

<sup>3</sup> These include Cherkaska, Chernihivska, Dnipropetrovska, Donetsk, Kyivska, Poltavska, and Sumska oblasts.

## SCENARIOS

Logistical barriers to humanitarian access mount, with frozen roads, snow accumulation, and insecurity limiting aid prepositioning and delivery for surge response and slowing energy and shelter-related repairs. People in high-risk zones, particularly Donetsk, Kharkivska, and Sumska oblasts, may experience delayed winterisation support given the high conflict intensity, continued shelling, and limited vendor presence.

## 2: High number of attacks damaging energy infrastructure + mild cold season



This scenario considers another severe situation similar to Scenario 1, but with more localised dynamics, particularly in northern and central Ukraine. Mild cold season conditions do not dampen the tempo of Russia's long-range strikes, and sustained attacks damage energy infrastructure and major population centres across the country, with dynamics similar to those described in Scenario 1. At the same time, active front lines in Donetsk, Kharkivska, and Sumska oblasts lead to sustained shelling and missile strikes, particularly on urban nodes in these regions. The front line is expected to continue evolving slowly in these areas, as weather and terrain conditions and a focus on tactical, positional warfare limit large-scale ground operations. Still, localised clashes, tactical activities, and small-scale advances continue to a limited extent, particularly in Donetsk oblast, where Russian operations are predominantly focused. Facilities generating both electricity and heating that remain in areas facing active hostilities – as well as further south in Khersonska and Mykolaviska oblasts – risk war-related operational disruptions.

Amid milder cold season temperatures, people across much of the country experience fewer periods of severe cold and limited snow accumulation, though northern and central oblasts<sup>4</sup> experience relatively colder conditions and more frost and snow than the rest of the country. Because isolated and extreme cold snaps remain possible in these areas, energy demand surges sporadically, which – combined with intensifying damages to energy infrastructure – is likely to overwhelm the power and heating systems, particularly centralised heating. This leads to unplanned power and heating outages for up to 12 hours during cold spells, which – compounded by the slow pace of repairs amid safety risks for energy workers, the impacts of cyberattacks, and potential cold weather risks such as rain, ice, and wind during cold spells

– leaves people in urban areas without central heating or the ability to use alternative heating sources reliant on power supply, such as electric heaters. Those in rural areas also struggle to access solid fuels amid insecurity and as surging demand drives up prices. So while the health and safety risks from exposure are lower on average, acute and short-duration spikes can cause prolonged unplanned outages and short-notice needs concentrated in northern and central oblasts.

### Impact on humanitarian needs

Despite milder seasonal temperatures, sustained attacks on Ukraine's energy infrastructure trigger acute humanitarian needs by overwhelming heating and power systems, especially during cold snaps. In northern and central oblasts, intermittent frost and snow events lead to surges in energy demand, which, when combined with damage from repeated strikes, cause unplanned power outages across urban areas dependent on district heating or electric heaters. Families in multi-storey buildings are particularly exposed, especially when systems fail without warning during sudden cold periods.

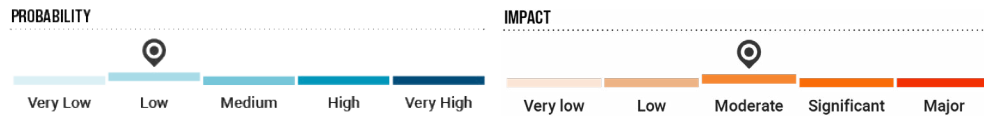
Urban areas show limited resilience, but logistical challenges, security constraints on energy workers, and the slow pace of repairs – owing to labour shortages, security risks, and occasional cold weather conditions – prevent rapid restoration, meaning outages last up to 12 hours a day on average. Cyberattacks and weather-related hazards (e.g., ice or wind) further complicate energy service continuity. In rural areas, market volatility caused by insecurity limits access to solid fuel. Localised fuel shortages are reported, especially near frontline areas, where high delivery costs and reduced vendor presence drive up prices. Increased spending on heating and electricity further strains family budgets, particularly in areas already affected by war and displacement. Families shift spending away from other essentials, including food and healthcare.

Rural families, especially those already facing poverty or displacement, are increasingly priced out of heating resources. IDP families face inconsistent heating access, particularly in informal housing or substandard rental units. People in rural areas and IDPs in poorly insulated homes are at a particularly severe risk from high heating costs, particularly in Dnipropetrovksa, Kharkivksa, Kyivska, and Odeska (184,000 IDPs) oblasts, as well as Kyiv city, which have the largest concentrations of IDPs in Ukraine, with Kyiv, Kyivska oblast, and Odeska oblast facing the highest median monthly utility costs (IOM 17/04/2025 and 22/05/2025). Displaced people living in collective sites face compounding risks: fuel shortages, inadequate insulation, and damaged infrastructure, all of which reduce their capacity to cope with even brief cold spells (CCCM Cluster 07/07/2025). Short-duration exposure leads to spikes in cold-related respiratory and cardiovascular illnesses, especially among older people and people with disabilities, mobility issues, and cardiac and respiratory conditions.

<sup>4</sup> Cherkasa, Chernihivska, Donetsk, Kharkivska, Kyiv and Kyivska, Poltavska, and Sumska oblasts.

## SCENARIOS

### 3: Low number of attacks damaging energy infrastructure + severe cold season



This scenario sees a cold season crisis driven by demand-side pressures on the energy grid driven primarily by extreme weather conditions. Russian attacks damaging energy infrastructure remain stably under 26% throughout the cold season, either: decreasing in the case of a successful ceasefire agreement; remaining at the same intensity as the current warm season (530 damages as of July 2025); or increasing by up to 25% more. Despite the resilience of the energy sector, an exceptionally severe and prolonged cold season (of more than 110 frost days) poses a new challenge for response efforts related to a surge in energy demand for heating and power. Ground operations related to the war continue in eastern and northern oblasts, particularly Donetsk, Kharkivska, and Sumska, but regular snow and frost conditions slow down the pace of advances in these areas. Localised clashes, as well as severe weather conditions, limit access for humanitarian responders as well as energy workers, who will need to adjust repair timelines for snow clearance and de-icing.

Despite relatively fewer new infrastructure attacks, the compounding effect of extreme weather on a weakened system results in a significant humanitarian crisis, with similar dynamics as those described in Scenario 1 – though outages and rationing are driven primarily by gaps between demand and supply and constraints on repairs and not by strike-driven asset losses.

#### Impact on humanitarian needs

Electricity remains available in most urban centres, such as in Kharkiv city, where a continuous power supply allows district heating to remain operational. The energy grid struggles to meet heightened demand for heating and electricity, however, particularly in frontline and rural areas, where planned outages last up to 12 hours daily. Planned outages and heating gaps remain common across Donetsk, Kharkivska, and Sumska oblasts, where the combined effects of legacy conflict damage, logistical bottlenecks, and extreme cold drive vulnerability. Solid fuel prices rise because of demand and supply shortages, while snowbound roads and low stock levels strain already fragile supply chains facing vendor shortages (KII 18/07/2025). The cost and volume of fuel required for heating increase sharply because of the prolonged cold, particularly in rural areas dependent on solid fuel. This disproportionately affects

older people, as well as people with disabilities and mobility impairments, who face barriers accessing markets or storing large volumes of fuel. High energy costs place the highest financial strain in rural areas dependent on solid fuels, forcing families to prioritise heating over other essential needs such as food and healthcare, while costs tied to urban settings, such as rent and small repairs, create financial strain for urban families (NRC 31/03/2025).

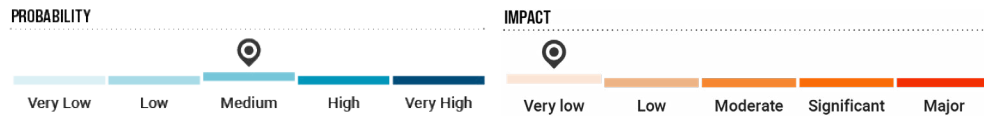
IDPs – particularly those in informal housing or temporary shelters – are also acutely vulnerable to heating gaps. While heating needs are not as severe as in high-attack scenarios, collective sites lacking generator fuel struggle to provide consistent electrical heating during power cuts. Rental costs remain high in many urban and semi-urban areas, notably in Mykolaivska oblast, where families face financial strain from rent, rising utility costs, and the risk of eviction (Concern 19/03/2025; IOM 22/05/2025). These pressures can drive localised displacement, especially toward urban centres and temporary shelters, which are already stretched thin. High energy costs could force families to allocate more than 25% of their income toward heating while reducing spending on essentials such as food and medicine.

Cold-related health risks rise markedly, with increasing hypothermia-related hospitalisations among children under five and older people. Although health facilities remain largely operational, some frontline facilities face fuel shortages that limit the operation of generators and backup power sources, compounded by the costs of maintaining heating systems such as boilers. Fire and carbon monoxide poisoning incidents rise, particularly in overcrowded housing and sites using improvised heating solutions.

Humanitarian access remains somewhat improved compared to high-intensity attack scenarios but is still hampered in frontline zones by severe weather and insecurity.

## SCENARIOS

## 4: Low number of attacks damaging energy infrastructure + mild cold season



This scenario represents relative stability but persistent vulnerabilities as milder-than-average cold season conditions, combined with a low level of attacks damaging energy infrastructure, create a period of fragile stability for the energy grid. Ukraine's energy sector takes advantage of the operational window for limited recovery and resilience-building, accelerating repairs, restoring and adding limited additional energy capacity, and reinforcing critical infrastructure, especially in areas less affected by direct hostilities in central and western Ukraine, such as Cherkaska, Khmelnytska, Kyivska, and Poltavaska oblasts. Occasional upticks in aerial attacks – still within the lower range – as well as supply chain delays and labour shortages complicate these stabilisation efforts.

With generally milder temperatures during the cold season, the demand for heating and other utilities remains stable, without major strains on operational capacity of the energy sector as described in Scenario 2. This creates conditions for a cautious recovery of certain energy systems, especially of district heating zones servicing urban areas in central and western oblasts. That said, in border regions – particularly Kharkivska and Sumska oblasts – exposed to colder temperatures, occasional surges in demand and continued strikes on energy infrastructure constrain recovery. In urban centres in Dnipropetrovaska, Khersonska, and Mykolaivska oblasts, repair needs also remain high. While mild conditions ease pressure on power and heating resources, many families beyond the 10,000-plus targeted for shelter insulation still face cold exposure from war-related housing damage and supply and market gaps, especially in Donetsk, Kharkivska, and Sumska oblasts (Humanitarian Action 17/07/2025). Although acute cold season energy needs are localised, humanitarian needs remain elevated – driven by economic deterioration, damaged housing, unemployment, and protracted displacement.

### Impact on humanitarian needs

Milder temperatures and repairs enable energy infrastructure restoration and the completion of new projects, benefiting people in urban areas, with district heating systems gradually recovering, particularly in urban and central areas such as Cherkaska, Poltavaska, and Kyivska oblasts. Healthcare services maintain steady operations with minimal outages, while

continued water and sanitation service provision reduces risks of disease outbreaks in these areas. While shelter insulation programmes have improved heating conditions for more than 10,000 families in frontline areas, many families in Donetsk, Kharkivska, and Sumska oblasts in particular remain exposed because of damaged housing and limited financial resources as a result of shelling and market and supply gaps driven by insecurity, movement restrictions, and high prices. This is particularly acute near the front line, where vendor coverage is low and people rely on fragile supply chains with overstretched logistics (DRC 11/07/2025). Older people – especially in Donetsk oblast, where data indicates a higher average age of people receiving aid – are at increased risk. Limited mobility reduces their ability to access local markets, while poor vendor presence and fewer delivery options in frontline areas increase dependence on irregular, informal fuel networks. People with disabilities or mobility issues also face barriers to safely acquiring, transporting, and storing fuel.

The fear of conscription also affects family dynamics, as men remain outside the labour market or turn to low-paying, informal, or remote work. In regions with the highest rates of conscription – Donetsk, Kharkivska, and Mykolayivska oblasts, as well as Zaporizka oblast – this creates gaps in cold season service provision (DRC 11/07/2025; KII 22/07/2025a). For example, markets, shops, and humanitarian responders providing food, fuel, and heating materials may face supply shortages and price increases amid a shortage of delivery drivers, particularly with increased lead times for supply deliveries.

While fuel shortages are largely localised, solid fuel and petrol prices have increased notably in rural areas and areas with active ground conflict as a result of disrupted supply chains, low local stock levels, and high prices – affecting the ability of rural communities in particular to access solid fuel. This drives more unregulated logging and informal supply chains, leaving rural communities further exposed to market volatility and resource depletion. While fuel is more expensive in eastern oblasts, delivery costs are highest in southern regions, such as Khersonska and Mykolaivska oblasts.

Despite the absence of large-scale cold-season-related displacements, sporadic clashes and insecurity in eastern and southern oblasts still threaten to trigger localised displacement or disrupt humanitarian operations. While milder cold season conditions have reduced direct cold-related threats in many parts of the country, IDPs – especially those in collective sites or rental housing – face increased exposure owing to the need and inaccessibility of repairs, as well as economic strain from rent burdens and the risk of eviction.

Humanitarian access constraints persist in areas with fighting, mine contamination, and insecurity. Even in areas with reduced conflict intensity, the threat of landmines and unexploded ordnance poses a significant challenge to safe aid delivery and movement. Where access is possible, it likely still hinges on mine clearance and the security of main and alternative roads.