

A woman stands on a sandy beach, holding a large Ukrainian flag that billows in the wind. The background features a dramatic sky with white, fluffy clouds and a dark, starry night sky. The overall mood is one of hope and resilience.

KYIV RYSING

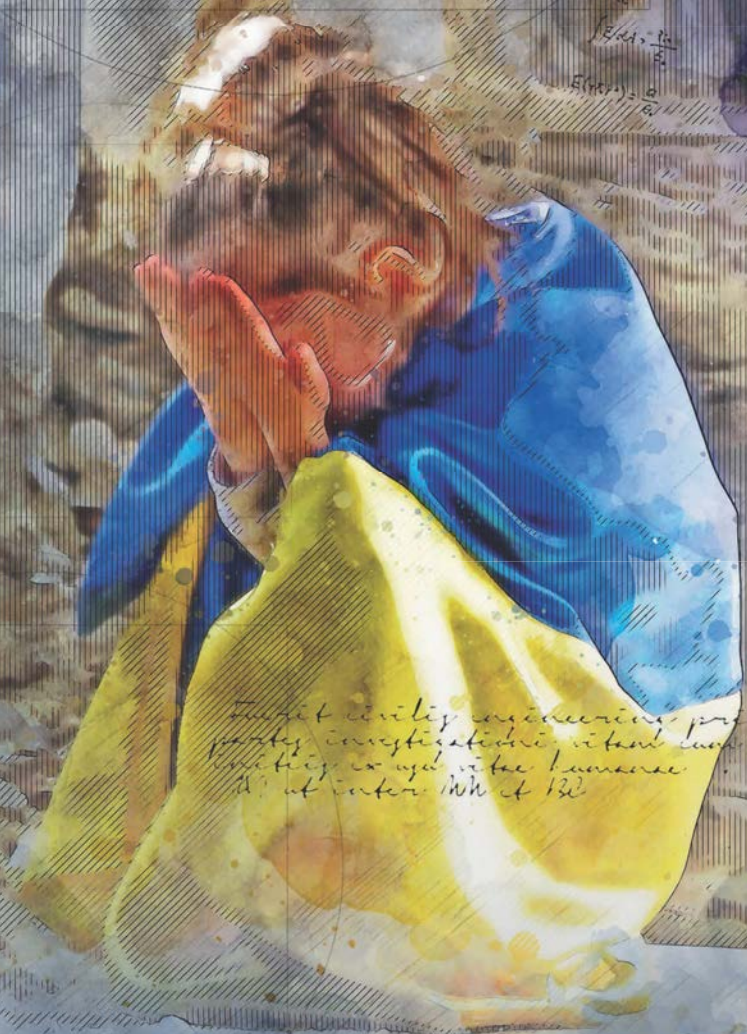
PAST | PRESENT | FUTURE

kyiv.consulting

*Ingénieur, c'est un art qui consiste
de physique appliquée, une science
fondamentale et un savoir-faire
humain, une compétence intellectuelle,
physique et morale.*

PRESENT

CHAPTER 2.0



PRESENT: INTRODUCTION



The second chapter sheds light on the current situation in Ukraine. As the war has touched all aspects of Ukraine's life, our mission was to make a blurred window clear by processing piles of various multi-sectoral data on the country's **Military, Social, Environmental** and **Economic** domains and presenting it in a structured, clear and concise way.

KYIV RYSING is based on desk research of publicly available data, conducted through the application of various types of techniques, such as **descriptive, exploratory, diagnostic, and predictive analysis**. This allowed gathering of qualitative and quantitative information regarding historical prerequisites that led to the outbreak of the war, as well as its impact on various areas of life in Ukraine and globally.

The data was enriched by interviews with more than 60 subject-matter experts and opinion leaders from Ukraine and abroad, who provided valuable insights and shared their perspectives on the overall situation in Ukraine and its implications across a relevant domain or industry.

The study also leverages the results of an online nationwide public survey that dates back to July-August 2022 and covers 1,000 respondents, reflecting the public opinion of ordinary Ukrainians aged 18 and above.

In the world of misinformation and propaganda, the idea of **KYIV RYSING** was **to relate facts, data, subject-matter experts' insights, as well as ordinary people's opinions on the situation in Ukraine**, and thus to provide an unbiased and objective picture for everyone to be able to make his / her own conclusions.

THE RUSSIAN INVASION OF UKRAINE BECAME A CHALLENGE FOR ALL THE SPHERES IN THE COUNTRY

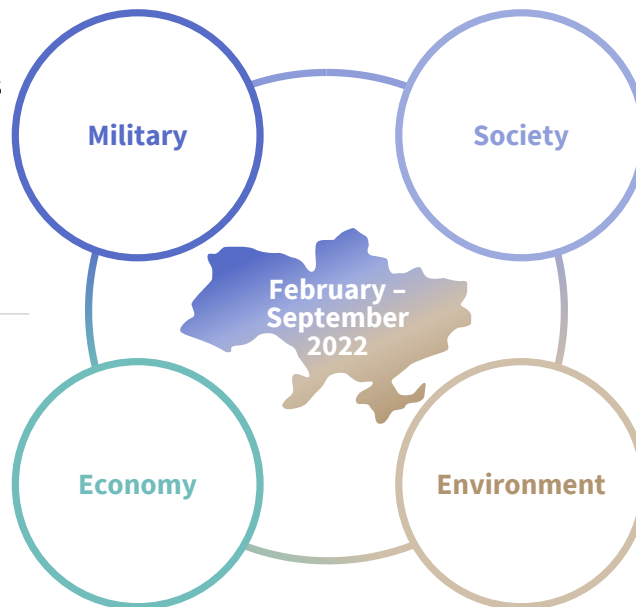
The full-scale Russian invasion had **an enormous impact on all the spheres of the country's life**. The Russian occupying forces, in violation of all the existing rules of international law, committed a huge number of war crimes and acts of terrorism that led to the **deaths of civilians, massive destruction of infrastructure, disruptions in national economic chains, and pollution of the environment**. Millions of people were forced to flee their homes, while hundreds of thousands decided to defend the independence and territorial integrity of their homeland.

Russia's war against Ukraine has continued for almost eight months, causing human and economic losses in Ukraine every day. Despite this, Ukrainians keep defending their country side by side with each other and their allies, bringing closer the long-awaited victory over the enemy. Therefore, **it is important to understand the current state of Ukraine's military, social, economic, and environmental spheres in order to ensure their resilience during the ongoing war, as well as comprehensive recovery after the victory is obtained.**

The impact of the Russian invasion of Ukraine

Since the beginning of the war, the Ukrainian army has been focusing on increasing its power to ensure the liberation of the occupied territories of Ukraine.

The war led to dramatic effects in the Ukrainian economy in the form of destroyed production facilities, blocked export routes, and a growing fiscal deficit.



The Russian invasion of Ukraine caused massive flows of refugees, as well as an increase in the level of unemployment in the country.

The Russian invasion exacerbated the pollution of air, land, and water in Ukraine. It has also put under threat biodiversity in the country.

Military



+10 times

increase in the military expenses of Ukraine after the beginning of the war

Society



6+ million

number of internally displaced people in Ukraine due to the war

Environment



+300,000 tonnes

amount of emissions caused by the shelling of oil & gas storage facilities

Economy



-35.0%

projected decrease in the GDP of Ukraine in 2022 compared to 2021

*ipsum enim est in civitate
de physica applicationem, circiter
pandipis et in pando pro
tuncque pando, cum intellectus
Physica et mathematica*

MILITARY

CHAPTER 2.1



THE MILITARY SECTOR HAS BECOME THE SHIELD OF UKRAINE DURING THE RUSSIAN INVASION

The Ukrainian military sector has been standing **at the forefront of the country's defence** since the beginning of the full-scale Russian invasion. Despite the quantitative superiority of the enemy in different types of weapons (artillery, aviation, missiles) and simultaneous attacks from different directions, the Armed Forces of Ukraine, along with other defence forces, **managed to withstand the first weeks of the war** and to stop the further offensive of the Russian occupiers. This became possible, in particular, due to the professionalism of the Ukrainian army along

with the military assistance of the allied countries. However, as the war is still continuing, **Ukraine needs a larger amount of weapons from international partners** to enable the liberation of the temporarily occupied territories and ensure security in the whole European region for many years ahead. For these reasons, it is highly important to highlight **the determining role of Ukraine's military sector in its defence** against Russia, as well as to understand the future plans for enhancing the military potential of Ukraine in a short and long-term period.



Military

The section discloses key aspects of the military sector of Ukraine before and during the full-scale Russian invasion in the context of:

- Balance of power
- The course of the war
- Key outcomes for the global military and defence sector



Balance of power

- Ukrainian army before the war
- Comparison of the military potential of Ukraine and Russia
- Military support to Ukraine by foreign partners



The course of the war

- First weeks of the full-scale Russian invasion of Ukraine
- Strategic changes in Russia's war against Ukraine during April-June 2022
- Stabilisation of the front-line and artillery war in July-September 2022





















Key outcomes for the global military and defence sector

- Peculiarities of Russia's war against Ukraine
- The impact of the war in Ukraine on the military and defence sector worldwide

SINCE 2014, THE ARMED FORCES OF UKRAINE HAVE COME THROUGH STRUCTURAL TRANSFORMATIONS

Financing and size of the Armed Forces of Ukraine

Period	President	Total personnel, thousands	Financing, share of the GDP ¹
1991 – 1994	Leonid Kravchuk	  980,000 – 455,000	 0.9%
1994 – 2005	Leonid Kuchma	  455,000 – 245,000	 1.4%
2005 – 2010	Viktor Yushchenko	  245,000 – 200,000	 1.1%
2010 – 2014	Viktor Yanukovich	  200,000 – 184,000	 1.0%
2014 – 2019	Petro Poroshenko	  184,000 – 250,000	 2.3%
2019 – present	Volodymyr Zelenskyy	  250,000 – 261,000 ²	 2.7%

After the dissolution of the Soviet Union in 1991, Ukraine inherited a large army with almost 1 million total military personnel, thousands of tanks and armoured vehicles, as well as the third largest nuclear arsenal after the USA and Russia (176 ballistic missiles and 2,500 units of tactical nuclear weapons).

From 1991 until the annexation of Crimea and the Russian aggression in the Eastern regions of Ukraine in 2014, the Armed Forces of Ukraine experienced a constant **reduction in the number of military personnel** and weapons due to the **significant deficit in financing**. The situation was aggravated by systemic corruption in the defence sector, as well as by the short-sighted defence policy of the country's top leadership. However, the beginning of the Russian aggression in 2014 forced the Ukrainian government to carry out a wide range of measures to enhance the power of the Armed Forces of Ukraine.

After 2014, the size of the Ukrainian army **increased to more than 250,000 military personnel**. Almost 20 combat brigades, new regiments and battalions, and units of operational, combat, logistics, and technical support were established. Along with the increase in quantity, the military leadership also initiated structural changes in the military's management, aiming to enhance the quality and effectiveness of the armed forces.

Selected reforms in the defence sector of Ukraine after 2014

Although the full-scale Russian invasion of Ukraine began on 24 February 2022, the military aggression of Russia against Ukraine has been continuing since 2014. During this 8-year period, the **Ukrainian army was built almost from scratch** and was **gaining combat experience in the Joint Forces Operation³** against the Russian army and pro-Russian separatist forces in the Donetsk and Luhansk region. Reforms in the defence sector of Ukraine over this period allowed them to **significantly improve the technical and organisational capacity of the Armed Forces**.



Increase in the number of military personnel, as well as the annual national defence budget of Ukraine. Reorganisation of military units / divisions



Gradual transition of the Armed Forces of Ukraine to the NATO standards (STANAG) in the technical and organisational spheres



Rearmament of Ukrainian army with new armoured vehicles, drones, missiles, anti-tank systems, etc. instead of Soviet models of weapons



Establishment of the new separate types of the Armed Forces of Ukraine: Special Operation Forces and Airborne Assault Troops



Development and improvement of the system of material and food supply of the Armed Forces of Ukraine

Source: UkrMilitary website; The Ministry of Defence of Ukraine website; Media overview

Notes: (1) Average for the period; (2) As of the beginning of 2022; (3) A complex of military and special organisational and legal measures of the Ukrainian security forces aimed at countering the illegal Russian and pro-Russian armed groups in the east of Ukraine

THE MILITARY SECTOR OF UKRAINE IS INFERIOR TO RUSSIA'S IN TERMS OF THE BALANCE OF POWER

From the very beginning of Russia's war against Ukraine, the balance of power was highly skewed towards Russia

A country's military potential is determined by a number of factors, starting from the country's overall size in terms of population, land area, economy, network of political allies, available technological advancements, etc., and ending specifically with an existing and ready-for-deployment army and weapons arsenal.

According to the Global Firepower 2022, **Ukraine ranks 22nd** among the **strongest armies of 142 countries**, while **Russia takes 2nd place**. The EU countries closest to Ukraine in the ranking are Spain (19th) and Poland (24th). Besides, France (7th), Italy (11th), and Germany (16th) are among the strongest armies in the EU.

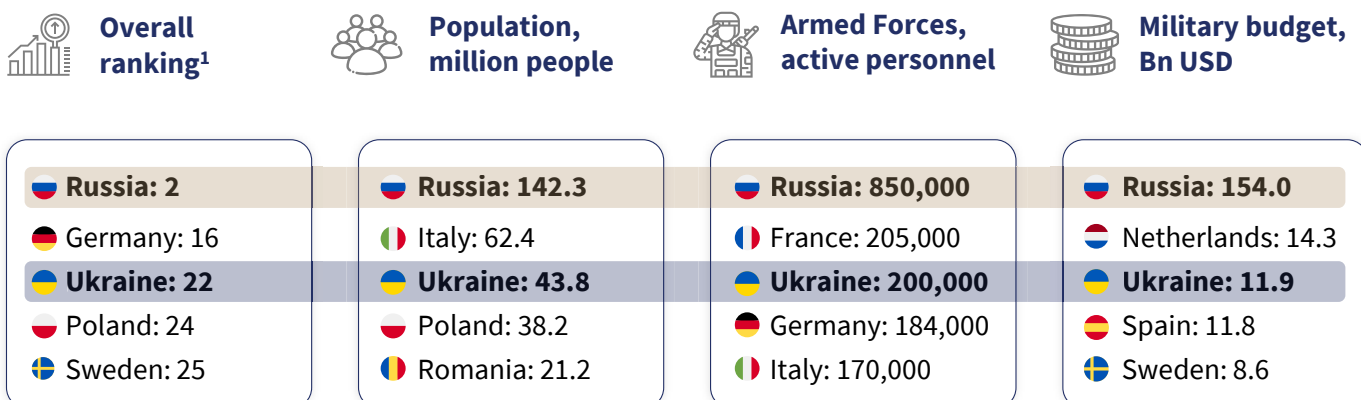
Russia has a population that **exceeds the population of Ukraine by more than threefold**, and available manpower in Russia is more than 3 times larger than in Ukraine (69.7 million people vs 22.3 million people, respectively). Russia is also a Top-3 spender on military expenditures after the USA and China, while Ukraine is only the 20th. Russia's **military budget is 13 times higher** than Ukraine's, which significantly complicates the opposition of Ukraine to occupiers in terms of the available weapons and other resources.¹ Despite this, Ukraine has been managing to resist the Russian army since the beginning of the full-scale invasion due to the **professionalism of the defence forces, support from volunteers, and military assistance from allied countries**.

Comparison of the sizes of the countries participating in Russia's war against Ukraine



After the beginning of the war on 24 February 2022, **Ukraine actually has to confront two countries – Russia, which acts directly as an aggressor, and Belarus, which provides its territory and military infrastructure to Russian forces to enable their invasion of Ukraine from the northern direction**. The total length of Ukraine's border with enemy countries is more than **3,300 km**, which significantly complicates the defence of the country from multiple directions. In addition, the colossal quantitative superiority of Russia in different types of resources has become a difficult challenge for Ukraine, requiring much effort to fight effectively against one of the largest countries in the world.

Russia and Ukraine compared to selected EU countries by selected criteria in 2022, influencing the country's military potential and defence capacity





Ukraine needs to join either NATO or another military-political union



We need to switch to NATO standards completely or become a part of it or become a part of another effective security system instead.

After this war, we need to build a strong defence system with everything we lack now, but additionally, we have to monitor and consider new threats and be ready to protect ourselves and the civilised world.

OLEKSI ZIBOROV

Community Policing and Communication Expert; Police Operations and Training Advisor

Involvement during Russia's war against Ukraine: Ever since Oleksii has joined the Armed Forces of Ukraine, he actively covers the situation at the front, tries to maintain the morale of the civilian population, drawing the attention of the local and foreign community to the war in Ukraine and the needs at the front.

After the beginning of the war, the saying 'Ukraine is the shield of Europe' has gained higher relevance. How can you comment on it?

Now we all have seen the way Russia is dealing with its neighbours. Stupid imperial ambitions and 'the right of force' led them to where they are now. Ukraine is not the only country that can suffer from bordering Russia but we managed to stop them. Ukraine is not the only country that suffered from bordering Russia, however, we managed to stop them. I am not sure if any of the NATO countries could be attacked openly without any military consequences, the way the Russians did it in Ukraine. But Russians are also skilled in a hybrid war, so attacking NATO member-states can be just a matter of time. Because of the war in Ukraine, Russia has lost a huge part of its military potential and its image as the 'second army in the world'. In fact, Russians have broken their spears against the 'shield of Europe'. Ukraine should definitely become a part of NATO or a new security system that will be efficient and ready to respond to modern threats. In the future, experience and specialists from Ukraine will be the resources that will be in high demand.

In your opinion, how important was the contribution of the allies to the success of Ukrainian army on the battlefield?

It is worth mentioning, that even before 24 February 2022 the USA and the UK provided Ukraine with Javelins and NLAWs (as far as I know), which proved their efficiency as anti-tank weapons during the first weeks of the full-scale invasion. Today we can see results, according to the information from the media and different social networks, how 155mm, as well as 105mm, long-range artillery is working on the frontline. M142 HIMARS and M270 MLRS with high precision rockets fueled by the skills of the Ukrainian soldiers have saved many lives of both the defenders and civilians. On the battlefield, we still need new weapon systems: artillery with enough amount of ammunition and counter-artillery systems, high-precision rocket systems, military UAVs (intelligence, surveillance and strikes), tanks and LAVs, as well as long-range anti-air systems to protect its cities from enemy missiles.

THE QUANTITATIVE SUPERIORITY OF THE RUSSIAN ARMY IN WEAPONS IS A CHALLENGE FOR UKRAINE

At the end of July 2022, **the estimated number of Ukrainian troops at the front was 200,000 - 300,000 soldiers**. Moreover, the country has already **mobilised approx. 700,000 soldiers**, some of which are undergoing training inside and outside the country — on the territory of the allied countries. Russian troops at the front are estimated to amount to 100,000 - 150,000 soldiers, a third of which might be from the so-called DNR and LNR.

However, Ukraine is inferior to Russia in terms of the number of weapons. At the beginning of the war, Ukraine had nearly three times fewer tanks than Russia. They became the main target of Ukrainian armed forces in the first months of the invasion, so Russia lost approximately half of its tanks.

Russia has an advantage in the number of volley fire systems. However, they have relatively low accuracy, which often causes casualties among civilians. On the other side, **M270 and HIMARS¹**, which were handed over to Ukraine by its allies, have a significantly better level of accuracy and have already been used for the destruction of logistical and fortified facilities of Russia in the temporarily occupied territories. However, the number of such systems in Ukraine is not yet high enough to reach dominance by these types of weapons.

Ukraine is also inferior to Russia in the number of ballistic and cruise missiles. Thus, the country needs to expand its missile arsenal to enable attacks on the enemy's military objects.

BALANCE OF POWER IN RUSSIA'S WAR AGAINST UKRAINE²



Artillery is one of the main advantages of the Russian military forces, particularly of the number of ammunitions of Soviet calibre. Russia maintained significant reserves of these types of ammunition after the dissolution of the Soviet Union. The Russian army fires **approximately 50,000 shells every day (or 1.5 million per month), which is close to World War II indicators**. The Ukrainian Armed Forces are striking the Russian logistics infrastructure to limit the firepower of its artillery.

Soviet models of artillery used by Russia have comparatively low accuracy and average range³, compared to NATO artillery supplied to Ukraine, which has better accuracy and higher range. However, **Ukraine had only approximately 300 NATO artillery systems, while Russia had nearly 3,000 artillery systems** as of the end of July 2022. Moreover, Ukraine may have problems with its Soviet models of artillery systems **due to a lack of ammunition for them**.

OPINION CORNER

Dr Inna Buresh

Talks about Army, Military Professionalism, and Perseverance



The **Russian invasion of Ukraine** showed the whole world how **desperate, patriotic, and professional** the Ukrainian army could be by **withstanding a more powerful enemy**. Ukrainians not only have shown the ability to use powerful and complex western weapons but showed **how effective their own military equipment could be**. Ukraine has proven the power of its own artillery, anti-ship missiles, and other types of weapons and military equipment, **demonstrating a high level of defence capability**.

Source: Forbes Ukraine website; Media overview
Notes: (1) High Mobility Artillery Rocket System; (2) As of July 2022; (3) Primarily up to 30-35 km

THE POWER OF ARTILLERY IS ONE OF THE MAJOR FACTORS IN THE RUSSIAN INVASION OF UKRAINE

The Russian invasion of Ukraine has demonstrated that **artillery plays an important role during the offensive and defence operations**. According to various estimates, artillery now accounts for 70 to 80% of all losses of both parties. In addition, the massive use of artillery was the main factor allowing the Russian army to advance over the past few months in the Luhansk region. Russian troops have a multiple numerical advantage in most types of artillery weapons, but they are inferior in accuracy and firing range to some types of weapons that are transferred to Ukraine by partners and allies. Amid the quantitative superiority of the Russian forces in artillery, **'counter-battery combat' becomes an especially important factor of success**. In the war of artillery, the

Ukrainian and Russian armies use different tactics. The occupiers, having a great advantage in the number of barrels and shells, fire large areas, while **Ukrainian soldiers hit pointwise – at specific targets** (command posts, warehouses, enemy's positions etc.). Ukrainian artillerists successfully carry out this kind of tasks, however, the existing amount of weapons and ammunition is still not enough to overcome the tactics of the 'barrage' of Russian troops and turn the tide of the artillery war in the favour of Ukraine. In order to ensure the counter-offensive of the Armed Forces of Ukraine for the de-occupation of the regions in the south and east of the country, **it is important to continue enhancing the power of Ukrainian artillery**.

ARTILLERY WAR DURING RUSSIA'S WAR AGAINST UKRAINE¹

Ukraine	Balance	Russia
Amount 200	Balance 1/3.8	Amount 750
Amount 100-250	Balance 1/2.5	Amount >550
Amount 400	Balance 1.6/1	Amount 250
Amount 280	Balance 1/4.5	Amount 1,300
Amount 200	Balance 1/6.5	Amount 1,300

The use of multiple launch rocket systems during Russia's war against Ukraine

- At the end of June 2022, the USA supplied Ukraine with the first multiple launch rocket systems, which resulted in the surge of activity of the Armed Forces of Ukraine. These systems allowed to make significant losses to the logistics of the enemy, as well as its command posts. This, in turn, has led to the **slow down of the offensive of the Russian occupying forces**
- Modern MLRS provide an almost guaranteed hit on any target larger than 10 m at a distance of more than 70 km. With one volley, the system can destroy 6-12 separate targets, depending on the type of installation
- As of the end of August 2022, the Armed Forces of Ukraine had more than **20 units of multiple launch rocket systems** – HIMARS, M270, and MARS

Key characteristics of the major MLRSs used by Ukraine	HIMARS M142	M270
Calibre	227 mm	227 mm
Number of missiles ²	6	12
Firing range ²	32-70 km	32-70 km
Maximum speed	85 km/h	64 km/h

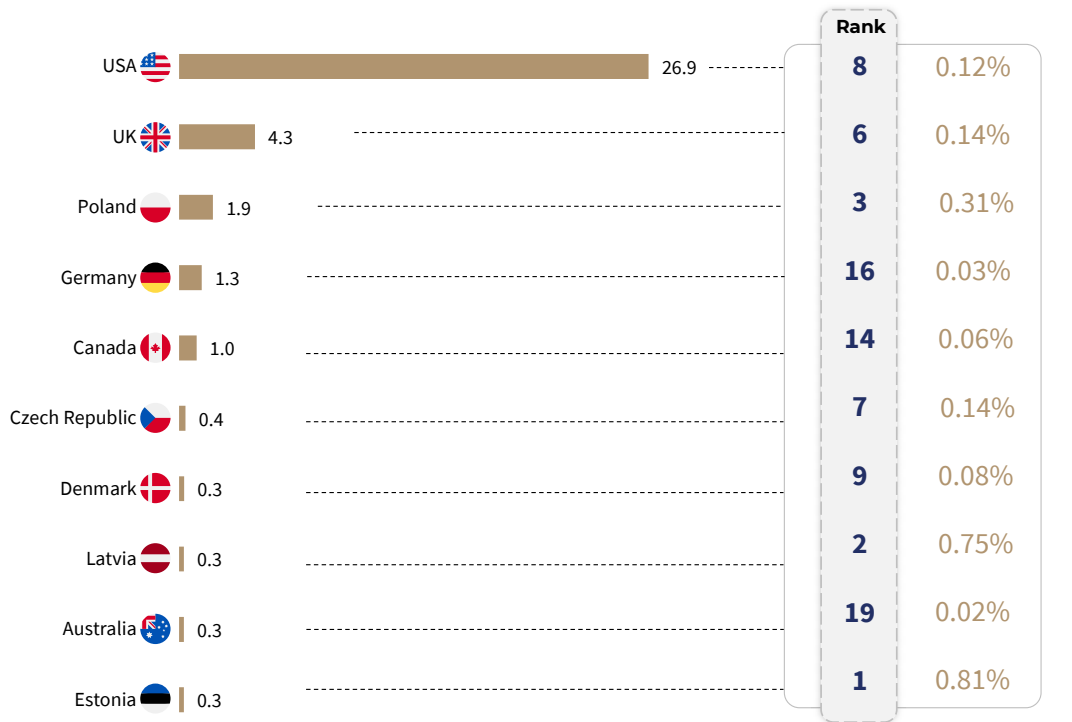
UKRAINE ALLIES AND PARTNERS PROVIDED MILITARY SUPPORT A DOZEN BILLION DOLLARS

Since the start of the **full-scale Russian war against Ukraine**, the **total volume of military support for Ukraine** has **substantially increased**. Allies provided both the Soviet-era weaponry that allowed faster usage on the battlefield and the **NATO-standard weaponry** that would, in the long run, re-arm the Ukrainian Army according to **NATO standards**. Since February 2022, the **complexity of military support has increased**, from anti-tank guided missiles to **Multiple Launch Rocket Systems (MLRS)** and **complex Air defence systems**. Thanks to the **courage and professionalism** of Ukrainian soldiers and the **full-scale support** of the allies and partners, Ukraine was **able to master the usage of weapons provided in a very short time period**.

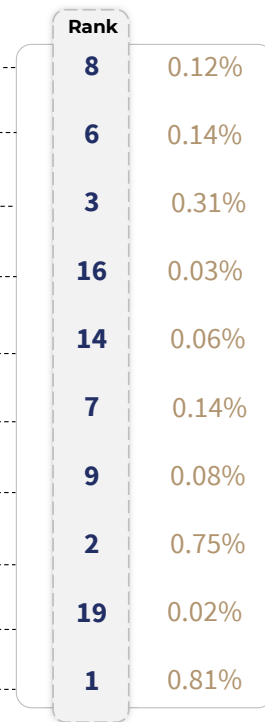
By **September 2022**, the **largest military support to Ukraine by volume** was provided by the **USA**, with about **27 Bn USD**. Moreover, in **May 2022**, the US Congress approved the **Ukraine Democracy Defence Lend-Lease Act of 2022**. The Act would come into effect in October 2022, which will **strengthen the support of Ukraine on its battlefields**. Most of the European countries supported Ukraine with some kind of arms, especially the **UK, Poland, and the Baltic countries**, via **bilateral commitments** or **group commitments** at the **Copenhagen conference**. Currently, complex **air defence systems, artillery, and fighter jets** are the **most crucial arms under discussion**.

Military commitments of the Ukraine partners and allies since 24 February 2022, Bn USD

Top-10 countries by volume of military commitments



Military commitment, % of GDP



Top-5 countries by disclosed military deliveries¹ between 24 February and 3 August 2022

	Armored vehicles	Tanks	Howitzers ²	MLRS
Total	568	260	320	35
USA	300		108	12
UK	120		22	
Australia	54		12	
Slovenia	35		18	
Lithuania	20		10	
Poland		240		
Czech Republic		20		20
Norway			22	
France			12	
Germany			10	3

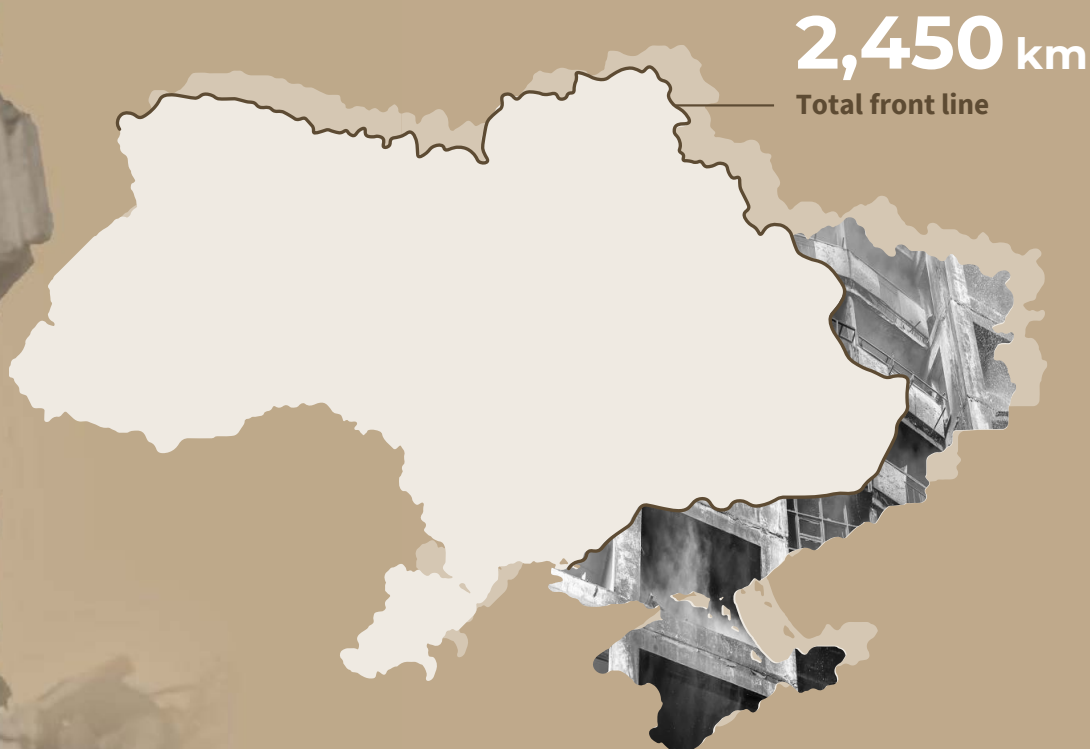
Even though Ukraine has received a substantial volume of weaponry from its allies and partners, **more is yet to come through disclosed or undisclosed commitments**. Aside from the **armoured vehicles, tanks, howitzers, and MLRS**, Ukraine has received **transport and attack helicopters** from the USA,

Slovakia, and the Czech Republic. **Air defence systems, like NASAMS, IRIS-T, and C-300**, were and will be provided by the USA, Germany, and Slovakia. As of August 2022, there are discussions undergoing with **Slovakia** to provide **11 MiG-29 fighter jets** to Ukraine.

DID YOU KNOW THAT THE FRONT LINE IN UKRAINE IS ABOUT 2,450 KM?



As a result of the full-scale Russian invasion, which began on 24 February 2022, a **large-scale front line** was formed in Ukraine, almost as long as the distance from Lisbon to Warsaw.



PHASE 6: A FULL-SCALE INVASION (1/4) FEBRUARY – MARCH 2022

On 24 February 2022, at 4:30 a.m. Kyiv time, V. Putin officially announced a 'Special military operation' in Ukraine, which was the beginning of the full-scale invasion of a sovereign state. V. Putin announced the goal of invasion as the 'demilitarisation and denazification' of Ukraine. The truth was that the Russian aim was to destroy Ukraine as a sovereign state. Russian forces began intensive shelling of Ukrainian Armed Forces units in the East and crossed the northeastern borders, as well as launching missiles and bombing airfields and weapons depots

throughout Ukraine. In response, the Ukrainian Parliament approved the imposition of Martial Law. Entering from Russia, Belarus, and occupied Crimea, Russian troops invaded Ukraine near Kharkiv, Kherson, Chernihiv, and Sumy. During the invasion, parts of the Kyiv and Chernihiv regions and almost all of the Sumy and Kherson regions were occupied by Russian troops. In the occupied territories, Russian troops robbed houses, kidnapped people, and murdered and raped civilians.

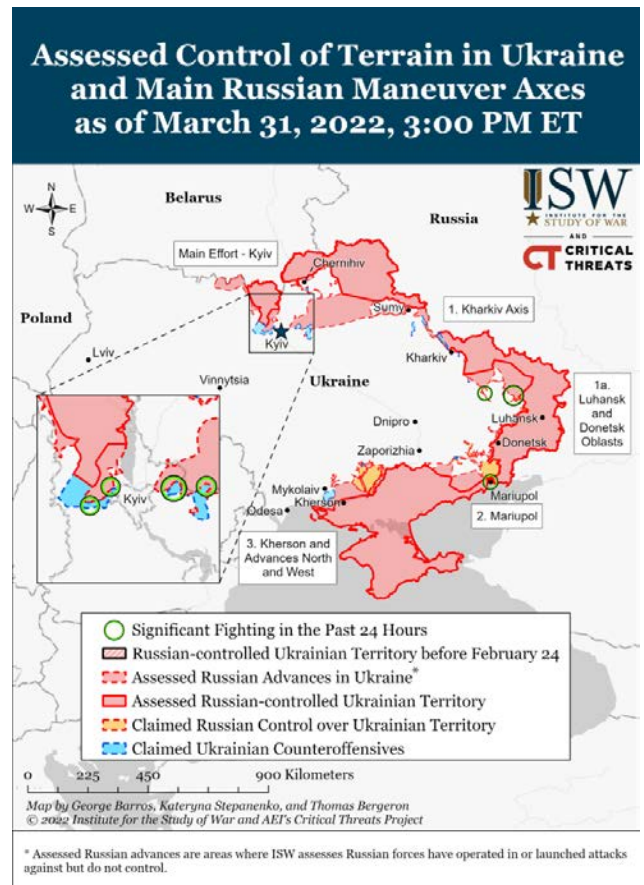
Main stages of the full-scale Russian invasion of Ukraine

February 2022

- The introduction of martial law in Ukraine and the general mobilisation were announced. Ukraine severed diplomatic relations with Russia
- On 24 February, Russian troops invaded the Chernobyl nuclear plant threatening global nuclear security. A Russian airborne assault consisting of 35 helicopters tried to storm the airfield in Hostomel in the Kyiv region but was destroyed by the Ukrainian military
- On 26 February, a plane with a Russian landing force was shot down near Vasylykiv, as well as a transport plane near Bila Tserkva
- In the first week of the war, Russia occupied the Azov region, from Kherson to the outskirts of Mariupol and Vasylyvka, the northern areas of the Kyiv region, Luhansk, Kharkiv, and Chernihiv regions, and almost all the Sumy region. Moreover, Russian troops attacked and shelled Kharkiv, Chernihiv, Sumy, and the suburbs of Kyiv
- On 28 February, Ukraine started the negotiation process with Russia

March 2022

- On 1 March, Russian troops began an assault on Kherson, which was accompanied by shelling of residential buildings
- Mariupol was blockaded and under constant shelling, and the humanitarian situation in the city was rapidly deteriorating. Battles began for Azovstal¹, which became the centre of resistance of the Ukrainian army
- On 9 March, the Russian invaders carried out an airstrike on a hospital in Mariupol, which fell on the maternity ward. As a result, 3 people were killed, including a child, and another 17 people were injured
- On 16 March, the Russian military dropped a powerful aerial bomb on the theatre in Mariupol, where hundreds of civilians were hiding; most of them died
- On 29 March, the building of the Mykolaiv Regional State Administration was destroyed by a rocket attack in the morning; 20 people died



Institute for the Study of War and AEI's Critical Threats Project

PHASE 6: A FULL-SCALE INVASION (2/4) APRIL – JUNE 2022

After the withdrawal of Russian troops from the Kyiv region, it was clear that the **occupation of Ukraine would require much more effort than Russian authorities initially expected**. In this regard, **V. Putin gave the order to ‘liberate the Donbas’**, which meant building up Russian forces in the territories of the Donetsk and Luhansk regions. However, **in April-June 2022, the Russian army was unable to execute this order, and the conquest of Mariupol**, with a population of over 400,000 people, as well as **Severodonetsk and Lysychansk** (more than 100,000 people both), **became their most significant achievements**.

Mariupol, a port city on the Sea of Azov, became one of the symbols of Ukrainian resistance. The city’s massive Azovstal

steelworks plant served as a shelter for thousands of civilians for months, and it also remained the last fortress for military units of defenders despite being surrounded, low on ammunition, and outnumbered by Russian forces.

In May 2022, **the Ukrainian army got an order to complete their ‘combat mission’ in Mariupol**, ending the 82-day battle for the city and saving the soldiers’ and civilians’ lives, which resulted in the Russian occupation of the territory.

At the same time, **Ukraine continued to strengthen ties with Western partners**, receiving modern offensive weapons, which gives reason to assume a turning point in hostilities in favour of the Armed Forces of Ukraine.

Main stages of the full-scale Russian invasion of Ukraine

April 2 0 2 2

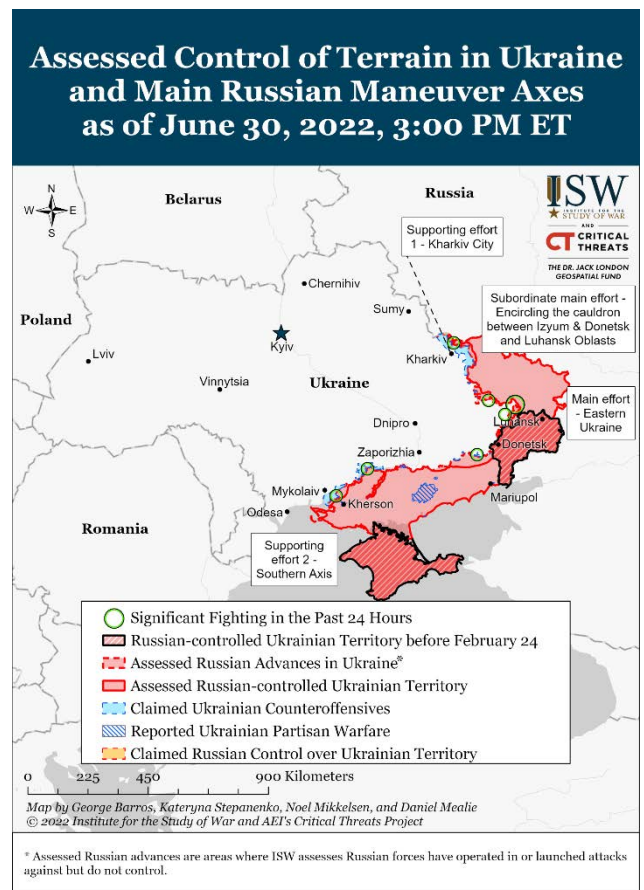
- Russian troops were forced to retreat with defeat from the **Kyiv, Chernihiv, and Sumy regions** while attempting to create new troops to establish control over parts of the **Kharkiv, Luhansk, and Donetsk regions**
- After the de-occupation of cities in the Kyiv region, the Ukrainian military, police, and international media representatives identified a huge number of **Ukrainian civilians killed by the Russians**. Evidence of **mass torture, looting, and rape** was found in Bucha, Irpin, Borodyanka, and other cities
- On 13 April, the **Russian Black Sea Fleet’s flagship ‘Moskva’** cruiser caught fire as a result of two Neptune missile strikes near Zmiinyi (Snake) Island and sank the next day

May 2 0 2 2

- The **Armed Forces of Ukraine launched a counteroffensive in the Kharkiv region**, while Russian troops shifted their main efforts to the Luhansk direction
- Russian troops continued to attack the Azovstal steelworks plant in Mariupol**, where civilians and the Ukrainian defenders continued to hide. On 16 May, the **evacuation of civilians, seriously wounded servicemen and other Ukrainian defenders from Azovstal** began. As of 20 May, about a thousand defenders of Mariupol surrendered
- Russian troops launched a massive offensive on the strategically important city of Severodonetsk** in the Luhansk region

June 2 0 2 2

- After almost a month of high-intensity fighting for Severodonetsk, the **Armed Forces of Ukraine left the city to prevent encirclement**. Later, President **Volodymyr Zelenskyy called the battle for this city ‘one of the most difficult’ in the war** and that **‘the fate of our Donbas is largely decided there’**
- The Navy of the Armed Forces of Ukraine destroyed the tugboat of the Black Sea Fleet of the Russian Federation – ‘Vasiliy Bekh’**, which was carrying Russian troops and weapons to Zmiiny (Snake) Island
- On 30 June, as a result of Ukraine’s military operation, the **Russian military evacuated the remnants of the garrison and left Zmiiny (Snake) Island**



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PHASE 6: A FULL-SCALE INVASION (3/4) JULY – AUGUST 2022

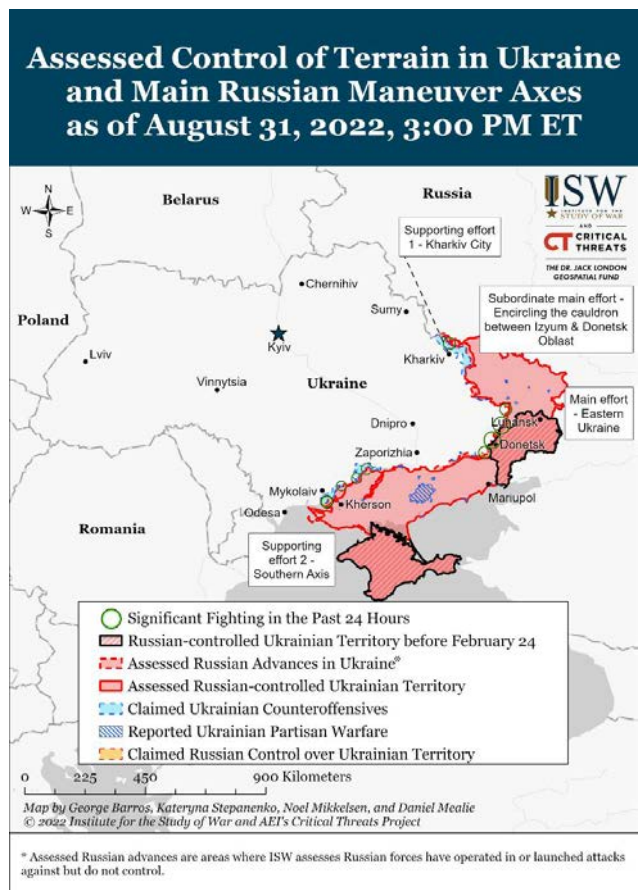
In **July and August**, shelling of **Ukrainian cities and civilian objects** continued. However, the effective use of weapons provided by **allies** enabled the **decrease in the intensity of Russian shelling** of Ukrainian cities by the **Armed Forces of Ukraine**. In August, Ukraine announced the **counteroffensive movements** towards the enemy positions on the **right bank of the Dnipro river**, which forced Russians to begin the massive transfer of their troops to the right bank of the Dnipro river in the Kherson region. Ukraine **managed to attack the bridges across Dnipro**, thus significantly **lowering the supply of Russian ammunition and troops** and **locking up** them on the right bank of Dnipro. August 2022 was the **first month** of a large-scale war when Russian invaders **did not manage to capture** a single city and a single large settlement in Ukraine due to the lack

of military power. At the same time, Ukraine **continued to intensify the military support** from its Western partners and allies. **On 20 July**, the fourth so-called **Ramstein conference** took place, where Ukraine **secured additional military support** from the USA and dozens of other countries. Main support included **HIMARS** Multiple Launch Rocket System and **Harpoon** anti-ship missiles. On 24 August, the USA announced over **3 Bn of USD extra aid** to Ukraine that included an advanced **Surface to Air Missile System – NASAMS**. **Germany** announced military aid that included the IRIS-T Surface to Air Missile Systems, which would strengthen Ukrainian self-defence capabilities. By the end of August, **Russia had failed to achieve any military gains** across all major frontline directions.

Main stages of the full-scale Russian invasion of Ukraine

July 2022

- On 1 July, the **Armed Forces of Ukraine completely liberated Snake Island** in the Black Sea, potentially opening the path for Ukrainian cargo ships to deliver agriculture and other goods worldwide
- On 3 July, **Ukraine announced the withdrawal of troops from Lysychansk¹**. **Russian militaries occupied the city**, having multiple advantages in the number of manpower and equipment over the Ukrainian defenders
- The **Armed Forces of Ukraine began to actively use** the received Western weapons, in particular, the **HIMARS** Multiple Launch Rocket System, **to hit Russian military depots, bases, and infrastructure in the temporarily occupied territories of Ukraine**
- The **Armed Forces of Ukraine** started to use **advanced artillery rounds**, like extended-range guided artillery shells **M982 Excalibur**, which allowed them to strike up to **50 km** behind the Russian frontline
- On 29 July, **Russian troops shelled the colony in the temporarily occupied Olenivka²**. Russian invaders held Ukrainian soldiers and civilians captive there, of whom **more than 50 people have died and nearly 130 injured**
- By the end of July, **Russian troops and mercenaries** gained some **minor territorial gain** to the **east and south of the city of Bakhmut**, with high casualties and limited opportunities to advance further



Institute for the Study of War and AEI's Critical Threats Project

August 2022

- The **intensity of missile attacks on Ukrainian cities has significantly decreased** as a result of the **continued successful use of Western weapons by the Armed Forces of Ukraine, particularly HIMARS**, to hit Russian military depots and bases
- Explosions rang out at the Russian military airfield in Novofedorivka** in occupied Crimea near Saky³ at **Russian ammunition depots** and the **Russian military air base** near Simferopol³
- On 11 August, Ukraine confirmed **significant military equipment commitments** in Copenhagen, Denmark, from **multiple European countries**. Initial military aid is estimated to be around **1.5 Bn Euro**, which will **strengthen Ukrainian counter-offensive plans**
- On 29 August, the **Armed Forces of Ukraine announced counter-offensive actions in the south of Ukraine**, particularly in the Kherson region, breaking through the first line of Russian defence

PHASE 6: A FULL-SCALE INVASION (4/4) SEPTEMBER 2022

Ukrainian counteroffensive in the Kherson region was accompanied by **strikes on bases** of the Russian Armed Forces and **warehouses with ammunition**, as well as the **destruction of Russian pontoon bridges** in the region. On September 6, the Armed Forces of Ukraine began a **counteroffensive in the Kharkiv region**, which became a tactical surprise for the Russian troops, leading to **mistakes by Russian commanders** and the subsequent **retreat of Russian forces** from the north and northeast of the Kharkiv region.

Since the beginning of the counteroffensive, the Armed Forces of Ukraine have **liberated more than 8,000 km² of Ukrainian territory** from the Russian occupiers. More than **420 settlements** and more than **150,000 residents** have been **liberated in the Kharkiv region**.



Over 7,000 civilians killed¹



140,000 civilian buildings destroyed²



Over 5,500 civilians injured¹



384 children died¹

Main stages of the full-scale Russian invasion of Ukraine

September 2022

- As a result of counter-offensive actions, on 4 August, the **Armed Forces of Ukraine announced the liberation of the village of Vysokopillia** in the north of the Kherson region from the Russian occupiers
- The systematic **destruction of Russian warehouses with ammunition and pontoon bridges** across rivers in the Kherson region
- On 6 September, Ukrainian troops launched a counter-offensive in the Kharkiv region, advancing more than 20 km** through the territory occupied by Russia and **recapturing about 400 km²**
- The Armed Forces of Ukraine **broke through the Russian defence and advanced almost 50 km**. In the course of conducting active counter-offensive actions in the Kharkiv direction, **more than 20 settlements were liberated**, including Balakliya — a city with a population of 27,000, which was under Russian occupation for six months. Moreover, the **Ukrainian army seized hundreds of units of captured Russian military equipment**
- Liberation of the cities of Kupiansk and Izium** in the Kharkiv region. As a result of the Russian invasion, **more than 80% of the infrastructure in Izium was destroyed**, and **more than 1,000 people died during the occupation**
- On 11 September, in the course of counter-offensive actions, the **Ukrainian military entered the state border of Ukraine in the north of the Kharkiv region**
- On 12 September, the Ukrainian military announced the **liberation of five settlements in Kherson Oblast and nearly 500 km² from the Russian occupation**
- Russia continued shelling Ukraine's critical infrastructure**, in particular, the **thermal power plant in Kharkiv, which left the city without electricity, water, and hydro-technical structures** in Kryvyi Rih, leading to the **rise of the water level in the Inhulets River to 3 metres** and the **flooding of 112 houses**
- A **large mass grave of Ukrainian soldiers** and about **500 civilian burials** were found in **liberated Izium** from Russian occupation
- Russian invaders launched a **missile strike on the South Ukraine Nuclear Power Plant**, with the rocket **falling 300 metres away from the nuclear reactors**
- Russian occupiers have announced the **holding of pseudo-referendums from 23 to 27 September 2022 on the accession to the Russian Federation of the temporarily occupied territories of Donetsk, Luhansk, Kherson, and Zaporizhzhia regions**
- On 21 September, Russia announced a **partial mobilisation**, during which it is planned to **call up about 300,000 people**

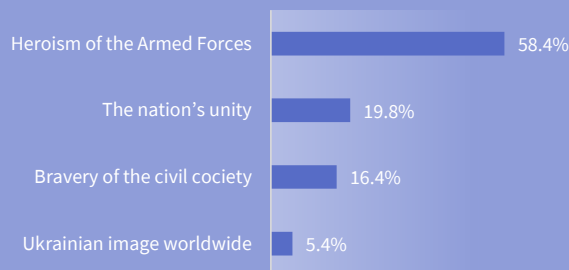


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VOLUNTEERS HAVE GREATLY CONTRIBUTED TO THE SUCCESS OF THE UKRAINIAN ARMED FORCES

After the beginning of the full-scale Russian invasion, the Armed Forces of Ukraine, together with other defence forces, demonstrated their readiness to resist occupiers and fight back successfully against the enemy's army. Therefore, the **heroism of the defenders of Ukraine** became a reason for pride for the majority of Ukrainians. Besides, the **exceptional unity of the nation**, along with the **bravery of the Ukrainian civil society**, made Ukrainians proud of their country, as well as motivated to volunteer and support the army in the fight for freedom and independence of Ukraine.

Reasons for the pride of Ukrainians after the beginning of the war¹



52.4%

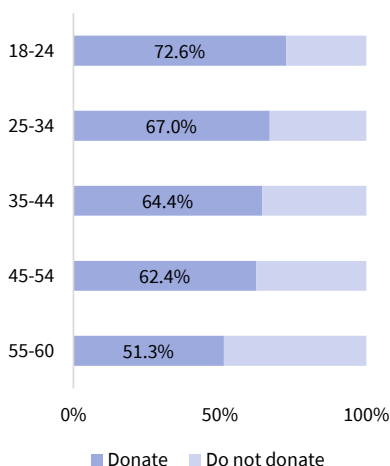
share of Ukrainians who have volunteered either full-time or partially since the beginning of the war¹

Since the beginning of the invasion, **a Ukrainian has volunteered either full-time or partially every second to help our military forces and refugees during the war**. Moreover, the massive donations by people in Ukraine and from abroad significantly supported the Ukrainian army with the purchase of various types of weapons and ammunition.

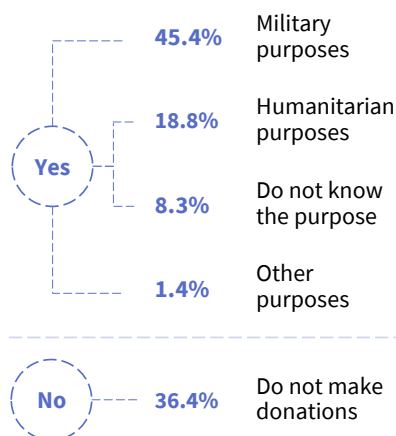
According to various estimates, since the beginning of the war, **Ukrainians and foreigners have donated more than 1 Bn USD** through the largest funds and campaigns to support the army and refugees. However, the actual scale of donations from Ukrainians is much higher, taking into account the donations made directly according to certain requests. With the collected funds, it became possible to **significantly improve the supply of Ukrainian soldiers with materials, including drones, cars, night vision devices, personal protective equipment, etc.**, which, in turn, had a huge impact on the success of the Ukrainian army on the battlefield.

The structure of donations made by Ukrainians during the war²

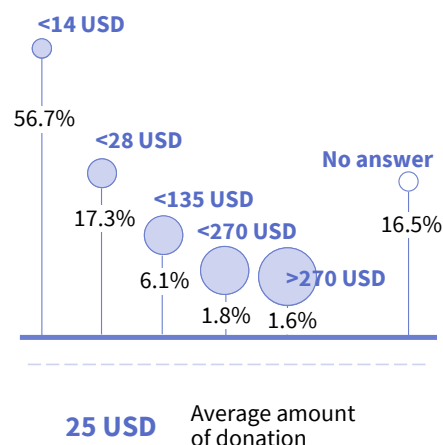
The breakdown of donators by age



Have you made donations since the invasion? If yes, for what purpose?



What is the average monthly donation amount you have made?³



The partners and allies of Ukraine have also been providing significant military, financial, and diplomatic support during the war against Russia. **More than 60% of Ukrainians admit the high influence of the response of international partners to the war** in Ukraine, yet the rest of the population considers that other countries are more focused on their national interests.



Has the response of international partners been sufficient for Ukraine to stop Russia?¹

42.2%

Yes, the global support is clearly seen

23.9%

Yes, but only from the neighbouring countries

Sources: Kyiv Consulting analysis; Gradus Research website

Notes: (1) Ukrainian population survey conducted by Kyiv Consulting, July-August 2022, n=1,000 respondents; (2) Based on the survey conducted by Gradus Research; (3) Figures are converted from UAH to USD based on the exchange rate as of 12 September 2022



Russian forces have to be stopped in Ukraine



Putin's worst nightmare is a vibrant, prosperous, and democratic Ukraine on Russia's border, showing the Russian people what their country could be if the kleptocratic regime ruling Russia was replaced by a democratic, free market system that functioned properly. The ultimate irony is that in setting out to make Russia great again, Putin has actually made NATO great again, generating unity among NATO members not seen since the end of the Cold War and prompting Finland and Sweden to seek to join NATO.

GENERAL DAVID H. PETRAEUS

Partner, KKR & Chairman, KKR Global Institute, USA

Involvement during Russia's war against Ukraine: General David H. Petraeus actively maintains awareness for support of Ukrainian forces and the Ukrainian government. He is a member of the Strategic Advisory Council (SAC), which provides support and advice to the Ukrainian World Congress's 'Unite with Ukraine' campaign. The SAC has set a goal of providing 100,000 Territorial Defence Force fighters with lifesaving protective gear, including helmets, body armour, ballistic eyewear, and medical kits.

How dangerous would be to freeze the conflict as per the 2014 scenario instead of restoring the Ukrainian borders fully? What would you say to those European politicians who prompt the opposite solution?

The grinding, costly, and slow advance of the Russian forces has to be stopped in Ukraine — and pushed back there. Western countries must enable Ukraine to retake as much of what has been lost since 24 February, if not all, and beyond.

We have to keep in mind that Putin wants not only to seize much more of Ukraine, but he also has greater ambitions to restore Russia to greatness. He wants to irrevocably weaken Ukraine and, ultimately, take away its independence.

I believe that the USA, Europe, and the western world will, despite the challenges of inflation, energy issues, and slowing economic growth, remain steadfast in their support for Ukraine, its forces, and its people — for whom all citizens of the free world have come to feel great admiration.

Putin's worst nightmare is, of course, a vibrant, prosperous, democratic Ukraine on Russia's border, showing the Russian people what their country could be if the kleptocratic regime ruling Russia was replaced by a democratic, free market system that functioned properly. Needless to say, the ultimate irony is that in setting out to make Russia great again, Putin has actually made NATO great again, generating unity and resolve among NATO members not seen since the end of the Cold War and prompting Finland and Sweden — two historically neutral, very capable, and geostrategically important states — to seek to join NATO.

THE LESSONS FROM RUSSIA'S WAR AGAINST UKRAINE WILL AFFECT OTHER MILITARIES

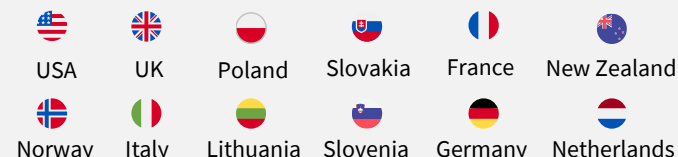
The importance of quality military training

The Russian military budget accounted for 154.0 Bn USD as of the beginning of 2022, while the Ukrainian one is more than ten times smaller — 11.9 Bn USD. However, **Russia has not achieved an overwhelming, lightning-fast victory, as the military equipment is not the deciding factor.** During the first seven months of Russia's war against Ukraine, **Ukrainian resistance and struggle have shown that quality leadership and training might make all the difference.**

Since 1993, **Ukraine has been implementing the American model of training**, according to which **junior officers and non-commissioned officers are assigned tasks, encouraging initiative in making tactical decisions on the ground.** In

addition, the **increase in the number of training programmes for the Ukrainian military abroad** contributes not only to the mastery of the use of Western-style weapons but also **increases the tactical training of Ukrainian soldiers.**

Selected countries, training Ukrainian military personnel in 2022



The advantage of nimble modern weapons

Selected list of modern high-accuracy weapons used by the Armed Forces of Ukraine²



X number of units in use

Ukraine continues to defend and regain its territory, in particular, thanks to the use of weapons transferred by allies. The heavy **Russian force in the form of tanks, supply trucks, helicopters, and fighter aircraft is being demolished by Ukrainian defensive units armed with light weapons, such as Stingers, Javelins, NLAWs, and drones.** The **use of HIMARS¹ made it possible to significantly reduce the advantage of Russian artillery.** In addition, **Russian naval ships had the upper hand over the Ukrainian fleet until Ukrainian Neptune and American Harpoon precision missiles** were used, forcing the Russian fleet to retreat.

The difficulty of concealing preparations for a full-scale invasion

Before the full-scale Russian invasion of Ukraine, **Kremlin-owned media increasingly spread propaganda that Ukraine was preparing to attack the Donbas region — or even Russia itself.** In the pre-invasion period, Russian coverage of the narrative about an impending Ukrainian attack rose dramatically and also became increasingly hostile.

Meanwhile, intelligence data, satellite images, and posts on social networks documented ongoing Russian troop movements and deployment along Ukraine's border. The **combined open-source intelligence analysis of Russia's preparations for the invasion, both online and offline, enabled an understanding that Russian intentions were hiding in plain sight.**

By 50% increased the amount of Russian propaganda about Ukraine in January 2022 compared to the previous month



~140,000 military personnel were pulled by Russia to the borders of Ukraine on the eve of a full-scale invasion on 24 February 2022



Continuing aggressive foreign policy of Russia



Since the dissolution of the Soviet Union in 1991, **Russia has been an aggressive player in the geopolitics of the past Soviet Union member states, not shying away from military intrusions that they were supposed to, broadly speaking, set the local controls.** Besides the two military interventions in Georgia, military support for Transnistria in its separation from Moldova, the two Chechen Wars, the annexation of Crimea, and the invasion of the East of Ukraine on 24 February 2022, Russia invaded Ukraine, starting the largest expansionist war of the XXIst century. **The aggressive and barbaric behaviour of Russia has become an integral part of its foreign policy and must not be tolerated in the future.**

The key to winning this artillery duel is to increase the lethality of the artillery rounds



The lessons learned from Russia's war against Ukraine are many and will be studied for generations. A smaller, motivated army with the will to fight can defeat a numerically superior army if it has better leadership, and leadership development throughout the organisation, and has just enough precision-guided weapons to effectively implement a superior strategy. Stingers, Javelins, NASAMs, HARMs, Neptunes, and HIMARs, together, with a smaller army, can defeat a far larger army.

DAN RICE

President of the Thayer Leadership; Special Advisor to the Commander In Chief Ukraine Armed Forces

Involvement during Russia's war against Ukraine: Dan Rice actively supports Ukraine on its way to Victory. In April 2022, he was named Special Advisor to General Valeriy Zaluzhnyy, Commander-in-Chief of the Ukrainian Armed Forces. Dan Rice started visiting Ukraine in May 2022 to directly learn about the leadership, leader development transformation of the Ukrainian Armed Forces from 2014 to the present day. He travels back and forth between Ukraine and Washington DC speaking, writing and lobby for more lethal, precision guided weapons on behalf of Ukraine. He is registered with the US Justice Department as an agent of Ukraine.

What are the main lessons for military people worldwide that could be taken from the case of Russia's war against Ukraine?

The lessons learned from Russia's war against Ukraine are many and will be studied for generations. A smaller, motivated army with the will to fight can defeat a numerically superior army if it has better leadership, and leadership development throughout the organisation, and has just enough precision-guided weapons to effectively implement a superior strategy. Stingers, Javelins, NASAMs, HARMs, Neptunes, and HIMARs, together, with a smaller army, can defeat a far larger army.

At this stage of the war, in September 2022, the war has ground down to a 2,000 km front and an artillery duel. Russia still holds an enormous numerical superiority in howitzers and tanks (which can fire indirect fire). The West has given nearly all the howitzers it can to Ukraine. But since the West cannot increase the number of artillery guns, the key to winning this artillery duel is to increase the lethality of the artillery rounds. The entire NATO defence of Europe against a planned Russian invasion was planned to be outgunned, but have far more lethal artillery rounds with Dual Purpose Improved Conventional Munitions (DPICM) which have 88 submunitions. These are between 5-15 times more lethal than the High Explosive artillery rounds currently being provided to Ukraine. With DPICM, Ukraine can go on the offensive and take back Donbas and Crimea. Without DPICM this war of attrition will likely remain an artillery war in which Ukraine is significantly outgunned. Ukraine, the USA, Russia, Poland, Romania, Latvia, and Estonia did not sign the Convention for Cluster Munitions agreement and should not be withholding DPICM from Ukraine using that convention as a reason.

This war should put into question the benefits of the Convention on Cluster Munitions (CCM) and if the CCM has emboldened Russian / Chinese / North Korean aggression, and weakened the West, by taking away one of the primary defensive weapons designed to deter their aggression. Ukraine needs DPICM to help win this war.

IMPACT OF THE RUSSIAN INVASION OF UKRAINE ON THE GLOBAL DEFENCE & MILITARY SECTOR IS RISING

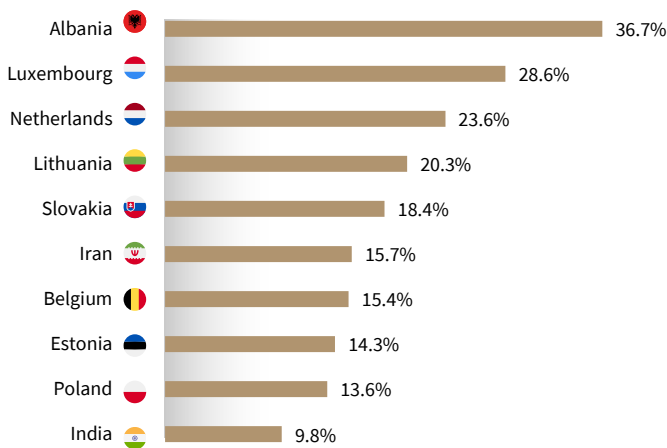
The Russian war against Ukraine has already **impacted the global security system and military sector by exacerbating geopolitical tensions worldwide and affecting countries to re-examine their defence budgets and military strategy.** After European defence spending growth by 4.8%¹ in real terms in 2021, **EU countries** are expected to **accelerate army modernisation and increase defence budgets** in 2022 and the next years.

After decades of neutrality, Finland and Sweden submitted applications to join NATO in May 2022. The membership applications have been spurred by security concerns over Russia's war in Ukraine. Moreover, NATO announced plans to bolster the

defences along the block's eastern flank, which includes training of more combat-ready troops and pre-positioned military equipment in eastern Europe. **In June 2022, in the context of rising global tensions, NATO endorsed a new Strategic Concept — the first since 2010. It declares Russia as 'the most significant and direct' threat to the alliance and increases focus on bolstering deterrence and defence, along with a new emphasis on building resilience.**

The worsening security environment in Europe and growing tension in the Indo-Pacific region are among the major challenges in the global security system.

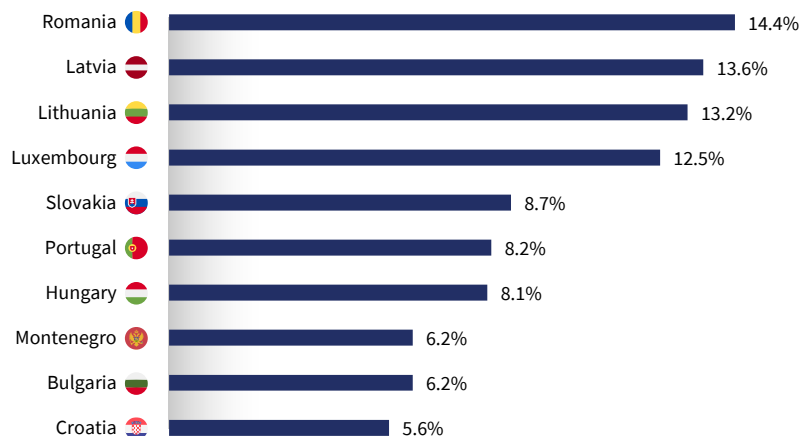
Defence budget growth in 2022 vs 2021, by countries²



After the world military expenditure passes 2 Tn USD for the first time in 2021, the defence expenditure is expected to grow in 2022, primarily in European countries due to upending the continent's security landscape caused by the Russian invasion of Ukraine. **Germany** announced spending an additional **112.7 Bn USD for the armed forces³**, which includes investments and armament projects for the German military, responding to Russia's invasion of Ukraine. In addition, Iran declared expanding its defence expenditure, preparing for possible growing tension in relations with Israel, while **Taiwan** announced a **double-digit increase in defence expenditure for 2023** amid escalating tension with China.

Military personnel growth in 2022 vs 2021, by countries^{4,5}

European countries, primarily Eastern European countries, are increasing the number of their armed forces in response to the Russian invasion of Ukraine. Latvia's Defence Ministry expects to extend its armed forces in active service by more than 80% by 2028 to strengthen the country's military capability, while Lithuania decided to increase the number of young people called up for compulsory military service to meet the increasing demand for junior officers. The government of Poland announced the bill, which provides to more than double the number of soldiers in the Polish army by 2027.



20 Bn USD⁶

are earmarked for the modernisation of the navy of Germany under its plan of the military upgrade over 2027



5.8 Bn USD

spent by Poland on purchasing tanks, howitzers, and fighter jets from South Korea to replace equipment provided to Ukraine



2.6 Bn USD

will be spent by Australia on buying long-range strike missiles years ahead of schedule because of growing external threats



1.3 Bn USD

will be spent by the USA on the development of advanced satellites designed to track hypersonic missile threats

DID YOU KNOW THAT VOLUNTEERS FROM MORE THAN 50 COUNTRIES CAME TO DEFEND UKRAINE?

After the full-scale Russian invasion of Ukraine on 24 February 2022, more **than 20,000 volunteers¹** from about **50 countries** joined the **International Legion** unit and stood up to **protect the territorial integrity of Ukraine**.

Selected list of countries represented in the Ukrainian International Legion



Australia



Brazil



Denmark



Finland



France



Georgia



Germany



Indonesia



Japan



Laos



Latvia



Lithuania



Netherlands



Norway



Poland



South Korea



Sweden



Syria



UK

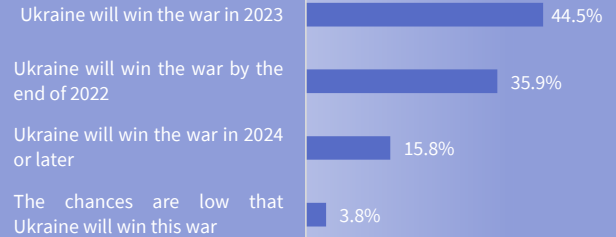


USA

THE MAJORITY OF UKRAINIANS BELIEVE THAT UKRAINE CAN WIN THE WAR IN 2023 OR SOONER

After more than 7 months since the beginning of the full-scale Russian invasion of Ukraine and the liberation of territories in the north and north-east of the country, about **45% of people believe that Ukraine will win the war in 2023**. At the same time, more than a third of Ukrainians consider that the victory of Ukraine is possible by even the end of this year.

In your opinion, what is the most likely scenario out of the following?¹



70.5%

share of Ukrainians who believe that in the medium-term perspective, Ukraine will become a member of EU¹

The views of Ukrainians are split in evaluating the current geopolitical situation and the country's future prospects. **23.1% of Ukrainians believe that in the nearest 5 years, Ukraine will be on the path to joining the EU and NATO**. 19.2% think that the next 5 years will open the door for the EU only. 28.2% are certain that Ukraine will enter the EU and NATO in less than 5 years.

Currently, **Ukraine has the status of a candidate**. Legally, the next step is the start of accession negotiations. But before that, the European Commission must assess Ukraine's progress in work on seven priority areas of reforms. Failure to fulfil the requirements may result in the cancellation of the candidate status for Ukraine.

The seven blocks of reforms that Ukraine must implement in order to maintain its status as a candidate and move forward with the EU integration process:

1. Adopt and implement legislation on the procedure for selecting judges to the Constitutional Court of Ukraine, with preliminary selection based on an assessment of their integrity and professional skills.
2. Complete an integrity check by the Ethics Council of candidates for membership in the High Council of Justice and the selection of candidates for the creation of the High Qualification Commission of Judges of Ukraine.
3. Finalise the appointment of the new head of the Specialized Anti-Corruption Prosecutor's Office by approving the determined winner; select and appoint a new director for the National Anti-Corruption Bureau of Ukraine.
4. Ensure compliance with the FATF² anti-money laundering legislation; adopt a comprehensive strategic plan for reforming the law enforcement sector.
5. Implement the 'anti-oligarchic law' to limit the excessive influence of oligarchs on economic, political, and social life in a legally sound manner, compliant with the opinion of the Venice Commission.
6. Overcome the influence of vested interests by aligning the media law with the EU Audiovisual Media Services Directive and devolving powers to an independent media regulator.
7. Complete the reform of the legislation on national minorities in accordance with the recommendations of the Venice Commission, together with mechanisms for its immediate and effective implementation.

Despite the full-scale Russian invasion, **the majority of Ukrainians have not relocated from the country**, while about 78.4% of the Ukrainians who have fled abroad are planning to return to their homeland after the war or active hostilities are over. This should allow Ukraine to avoid the outflow of its human capital, which is highly important for the post-war recovery of the country.

?

Do you plan to return to Ukraine?¹

46.7%

Yes, when the war is fully over

31.7%

Yes, when military actions at my place of residence are over



To Putin independent Ukraine poses an existential threat



There was (and remains) a lack of understanding in most Western capitals over the strength of Putin's obsession with Ukraine. He firmly believes that Ukraine has been artificially separated from Russia and sees the emergence of a democratic, European Ukraine as a deliberate attempt to spark the next stage of a Russian imperial retreat which began in 1989. In other words, Putin is convinced that preventing the loss of Ukraine is a matter of existential importance for the survival of the Russian state.

PETER DICKINSON

UkraineAlert Editor at Atlantic Council

Involvement during Russia's war against Ukraine: Peter Dickinson holds an active civic position, trying to raise awareness on the current state of affairs in Ukraine, giving special attention to the influence and affects of the military actions in Ukraine both on a local and global levels.

Not many countries, including European ones, seemed to expect that Russia would really invade Ukraine. How could you explain this given the track record of Russian military activities in other countries?

Despite the widespread availability of highly accurate intelligence reports regarding Putin's intention to launch a full-scale invasion of Ukraine, a mood of widespread scepticism prevailed right up until 24 February. This was true in Ukraine and in Western capitals. Indeed, the available information strongly indicates that very few members of the Russian establishment felt an invasion was imminent. This scepticism was primarily rooted in the assumption that a full-scale invasion would be disastrous for Russia.

What was the reason for other states to perceive Ukraine as a victim that would not stand against Russia in the first days of the invasion? What went wrong with the Ukrainian brand image in the past, and what lessons can be taken out of this?

Prior to the invasion, Ukraine was probably the most misunderstood country in Europe. Almost all international media coverage of Ukraine since the country first became independent in 1991 was produced by Moscow correspondents whose reports frequently served to perpetuate common Russian stereotypes and negative perceptions of Ukraine. Successive Ukrainian governments neglected the country's international image and little was ever done to establish a Ukrainian brand among outside audiences.



Sooner or later Putinism will falter



Under Putinism, Russia has turned into an authoritarian, expansionist, backward-looking, and aggressive country. A country ruled by a kleptocratic gang of revisionist FSB agents. Cracking down Putinism can only be done by the Russian people. But we, the democratic world, must not stand idle. Putin does not show any signs of abandoning his sick fantasies of subjugating Ukraine; nor has he altered his strategic goal of changing Europe's political map with military force. Sooner or later Putinism will falter – simply because people seek to look forward, and not backward.

DR STEFANIE BABST

Former NATO Deputy Assistant Secretary General

Involvement during Russia's war against Ukraine: Dr Babst raises awareness to the war, expressing her solidarity with the Ukrainians and support for the victims of the war. She is an advocate of Ukraine's sovereignty and territorial integrity, stands for a long-term, robust, and globally networked Roll Back Russia strategy, emphasising that Russia's invasion is a global challenge and the war is a serious blow to globalisation.

What is the most effective way of interaction between Ukraine and Russia if they have drastically different kinds of political behaviour?

The Kremlin's ambition to recreate a sphere of influence and deny other countries the right to choose their own path is set to remain a fundamental challenge for the European democracies as long as Putin reigns over Russia. Designing a broader and internationally well-coordinated strategy against the regime in Moscow is therefore a must-do for the transatlantic community. The core objective of a 'Roll Back Russia' strategy should first and foremost be to insist on the preservation of Ukraine's full and unconditioned state sovereignty and territorial integrity.

In your opinion, what are the Top-3 decisions to be made by the Ukrainian government once martial law is lifted?

The first one is time: time to heal the emotional and physical wounds of millions of Ukrainians who had to endure Russia's terror. The second one is ownership and participation: while Ukraine's government and state institutions will be in the driving seat to develop the political and economic framework for the country's reconstruction, the participation of civil society, NGOs and individual Ukrainians in this process is key. And the third one is transparency and accountability: any post-war political or economic decision must be guided by the abovementioned principles.



Motivation, resilience, and courage of soldiers and officers remain the key success factors



We are grateful to our foreign partners for the provision of medical support. But now and after the war, this work needs a systematic and massive approach. It is, therefore, necessary to develop, on a wider scale, our own national and local medical and psychological rehabilitation centres, with technological assistance (in the form of equipment and treatment protocols), with account of foreign experience in medical treatment and the material provision of healthcare professionals.

DR SERHII CHERVONOPYSKYI

Chairman of the Ukrainian Union of Afghanistan Veterans; Lieutenant General; Hero of Ukraine

Involvement during Russia's war against Ukraine: Together with his brothers-in-arms, combat veterans, Serhii directed his efforts to support territorial defence battalions in their fight for the independence and territorial integrity of Ukraine. By leveraging his position in the Ukrainian society, Serhii draws public attention to the need of a comprehensive approach to elimination of the consequences of war in the humanitarian sphere.

In your view, what state initiatives and programmes need to be implemented to bring the military back to normal civilian life?

This issue has to be tackled at the very beginning of military service. A well-prepared soldier is more resistant in overcoming various negative situations and cases at military service, he / she is consequently less traumatised physically and psychologically. Priority in rehabilitation programmes should be given to the families of the deceased soldiers, and to the families of persons who became disabled as a result of the war, for whom the provision of housing is a priority.

For the ex-servicemen who have not been wounded, the main thing is to find a job with decent wages. This requires programmes to create such jobs and appropriate vocational training. For soldiers who became disabled as a result of the war, treatment and prosthetics programmes are essential, while at the same time opportunities for socially useful activities and accessible work should be provided.

The world currently has various ratings of the power of armies, which usually assess their potential quantitatively. Can a significant quantitative military advantage be gained at the expense of highly accurate weapons?

Power rankings of the global armies based on the criteria of quantity, quality, and the technology of weapons can only assess the ability to destroy the enemy and to win a fight or a battle. However, it is always important to retain the results of conquests.

The motivation, resilience, and courage of soldiers and officers remain the key success factors. It is difficult to transform this into quantitative criteria. The well-known 'Afghan experience' of the wars of the XX century (UK, USSR) and of the XXI century (USA, NATO) has proved that the number of weapons and the availability of new technologies is a necessary condition, but not enough to win.

SOCIETY

CHAPTER 2.2



RUSSIAN INVASION CAUSED A REFUGEE CRISIS AND DAMAGE TO SOCIAL INFRASTRUCTURE IN UKRAINE

The Russian invasion negatively affected the Ukrainian social sector, causing a high level of internal and external migration, unemployment growth, and the destruction of cultural sites as well as educational and medical institutions. About **one-third of Ukrainians were forced to leave their homes to save their own lives**, so Ukraine became the second-largest country in the world by the number of external refugees. Due to the full-scale Russian

invasion, **a third of employees in Ukraine have lost their jobs**. During the war in Ukraine, the Russian army also **partially or fully demolished 161 Ukrainian cultural sites**, as well as **fully destroyed 209 education buildings and 127 medical facilities**. For these reasons, it is highly important to understand the scope of the war's **impact on the Ukrainian social sector** and the future plans for its recovery.



Society

The section discloses key aspects of the development of social sectors in Ukraine before the full-scale war and describes major changes caused by the Russian invasion for / related to:

- Refugees
- Employment
- Ukrainian identity
- Education
- Healthcare



Refugees

- Migration flows within the Post-Soviet time and before Russia's war against Ukraine
- Changes in internal and external migration during the war
- The impact of Ukrainian refugee flow on European countries



Employment

- Key characteristics of Ukraine's labour market before the war
- Consequences of the war on employment in Ukraine
- Employment among refugees and its impact on the hosting countries



Ukrainian identity

- Core values of the Ukrainian nation
- Struggle for Ukrainian language and culture
- Protection of the cultural heritage of Ukraine during the war



Education

- Structure of Ukraine's education system and its transformation
- Impact of the Russian invasion on education in Ukraine
- International support to Ukrainian students during the war



Healthcare

- Challenges and transformation of medicine in Ukraine before the war
- Impact of the war on medicine in Ukraine
- Foreign support of the Ukrainian healthcare system since the Russian invasion

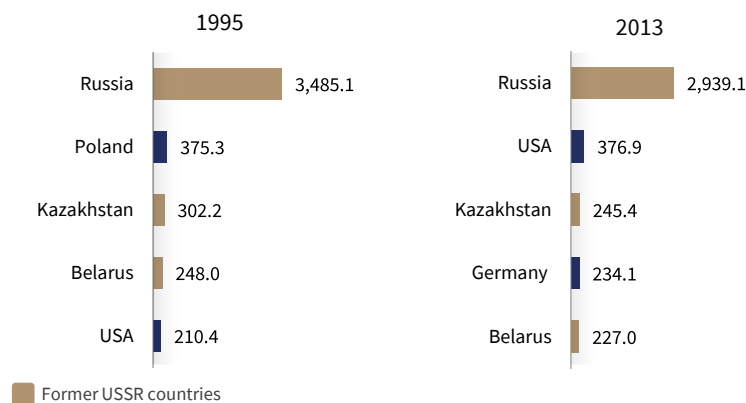
RUSSIA WAS THE MAIN DESTINATION FOR UKRAINIAN MIGRANTS IN THE PAST



The migration outflow from Independent Ukraine started in 1991 and was driven mainly by the **economic and political instability in the country** after the break-up of the Soviet Union. Within the first decade of Ukraine's independence, almost 85% of Ukrainian migrants settled in the former Soviet Union countries.

After the break-up of the Soviet Union, Russia and other CIS countries were attractive destinations for Ukrainians. Common historical past, the proximity of location, absence of language barriers, close family ties, and, most importantly, favourable policy regarding Ukrainians' employment contributed to the influx of labour migrants from Ukraine.

Top-5 destinations of Ukrainian migrants, thousand people



Bilateral intergovernmental agreements signed by Ukraine and former Soviet Union countries protected the interests of Ukrainians temporarily working abroad. As of the 2000s, these agreements were **concluded with Azerbaijan, Armenia, Belarus, Latvia, Lithuania, Moldova, and Russia**. According to the agreements, legal labour migrants from Ukraine had the **same social rights as local citizens** and **were protected by official labour contracts**. At the same time, the **entire period of legal work** of Ukrainians was included in **the Ukrainian pensionable service**.



Since 2014, another big wave of migration from Ukraine has been driven by the Russian **annexation of Crimea and military aggression in the Eastern regions**. Thus, external migrant flows have shifted **to the EU and North American countries**. In addition, **starting from 2014, Ukraine has experienced the most significant internal displacement in Europe since World War II**. As of March 2015, almost one year after the Russian occupation of Donbas and Crimea, **the number of internally displaced people (IDP) reached 1.2 million**. **Kharkiv, Kyiv regions, and non-occupied parts of Donetsk and Luhansk regions** accepted the majority of IDP.

Top IDP destinations by region, as of March 2015



THE WAR CAUSED MASSIVE FLOWS OF UKRAINIAN REFUGEES WITHIN THE COUNTRY AND ABROAD

Post Soviet Time
(1991 - 2014)

Military aggression
2014 - 2022

Full-scale war
(February 2022 – ongoing)

Since the full-scale Russian invasion of Ukraine, nearly **one-third of Ukrainians have left their homes** in seek of a safe haven. Massive displacement movements were also registered within the country. **Western regions of Ukraine became the preferred destinations**, as at the beginning of the war, they were considered by refugees as the safest territories. **Poland, Germany, and the Czech Republic** had the biggest inflow of Ukrainian refugees and responded quickly by **offering temporary protection and support**. Overall, the situation in Ukraine has been recognised as the **biggest human displacement crisis in the world nowadays**.

Outbound Ukrainian refugees at a glance as of 8 September 2022



7.2 million

settled in Europe and Russia



90%

were women and children



~60%

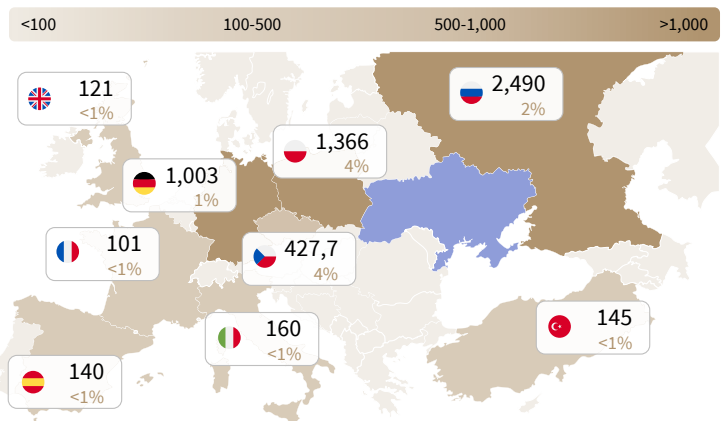
came back to Ukraine¹



4.0 million

applied for temporary protection

Key destinations, thousand people



xx Number of Ukrainian refugees, thousand people
x% Share of Ukrainian refugees in country's population

In 2022, Ukraine became the **Top-2 country in the world in terms of the number of outbound refugees** (1st place – Syria). The majority of refugees settled in **EU countries** promptly in accordance with the **Temporary Protection Initiative**. However, over two million people were deported or forced to evacuate to Russia. After the de-occupation of the northern regions, **people started to return back**, especially from the other regions of Ukraine. According to the Razumkov Centre poll¹, 97% of outbound refugees plan to **come back from abroad after the end of the war or sooner**.

Internally displaced people at a glance as of 8 September 2022



7.0 million

people considered as IDP

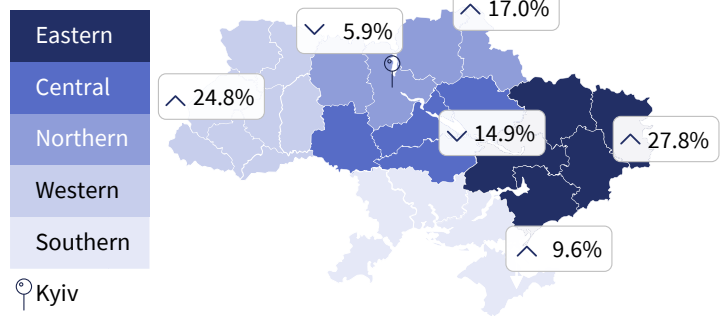


38%

of IDP have at least one underage child

Since the beginning of the war, more than 16% of the total population of Ukraine had been forced to move to another location in Ukraine, thus, becoming IDP. The government approved a **social package for IDP, along with assistance in finding accommodation and new jobs**. Apart from individuals, almost 16% of businesses relocated their activities to other regions of Ukraine or abroad³.

IDP by current location



xx% Share in the total number of IDP
^ Changes in August compared to July 2022

DESPITE THE NEGATIVE SHORT TERM IMPACT, THE REFUGEE CRISIS HAS LASTING BENEFITS FOR THE EU

Post Soviet Time
(1991 - 2014)

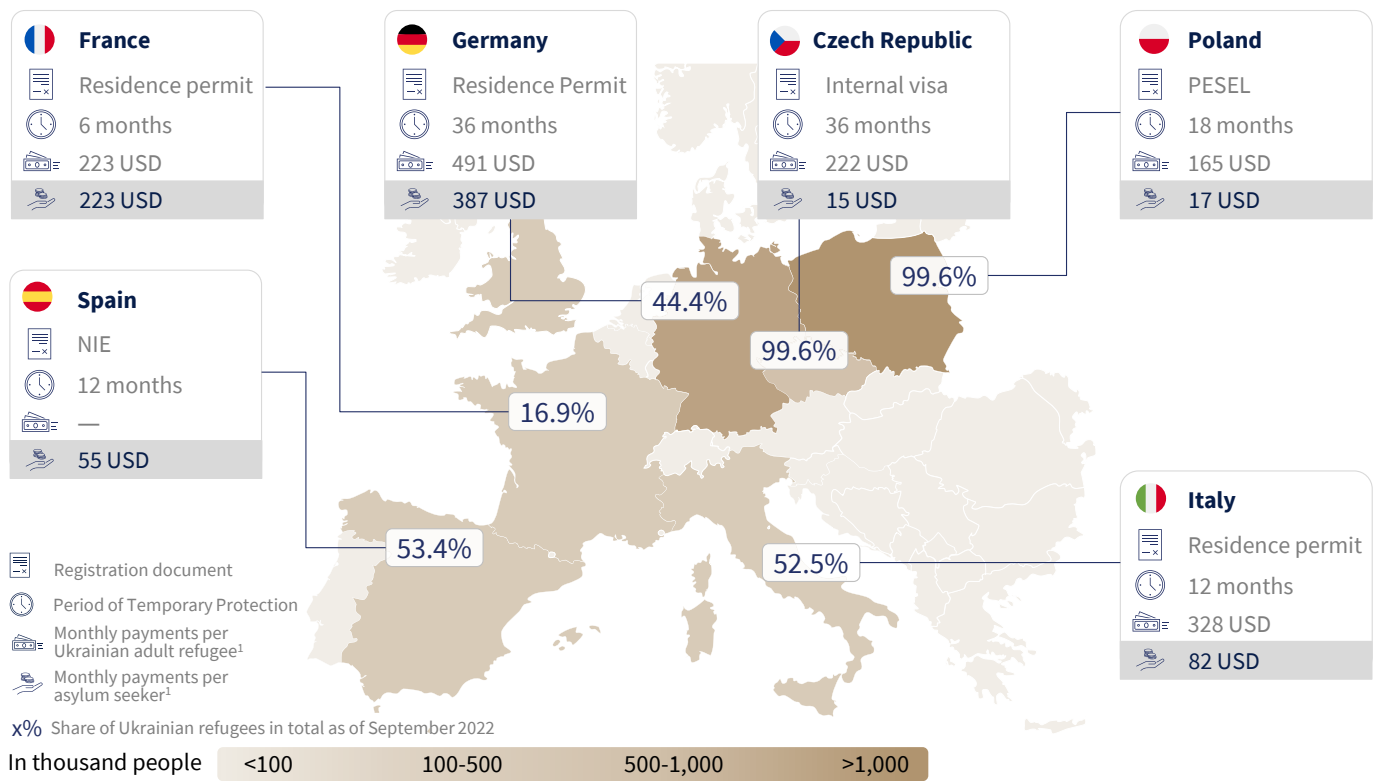
Military aggression
2014 - 2022

Full-scale war
(February 2022 – ongoing)

In 2015, Europe experienced **the Syrian refugee crisis**. It resulted in **the growth of asylum applicants** in the EU to **1.3 million people**, a 129% increase compared to 2014. In 2021, **Syrians, Afghans, and Iraqis** comprised **~40%** of all asylum applicants in the EU. However, the war in Ukraine exacerbated the migration crisis in the EU. European countries promptly responded to the increase in Ukrainian refugee numbers and introduced **measures** to support those who were forced to leave their homes. In 2021, Ukraine **was the 23rd in the number of asylum applicants filed in the EU**. However, **in March 2022, Ukrainians were the largest group of people seeking asylum**.

Response of the European countries to the Ukrainian refugee crisis

EU countries, Temporary Protection



Temporary Protection allowed Ukrainian refugees to stay legally in EU countries, ensuring access to work, social welfare, and medical care. Germany and France, which had past experience in accepting refugees from the Middle East, established fast mechanisms for the provision of assistance to refugees. Also, Poland and the Czech Republic provided Ukrainian refugees with much greater support than that granted to non-Ukrainian refugees. In order to accelerate the integration of Ukrainian refugees into their societies, EU countries offered a range of benefits, such as free travel till July 2022, free language courses, and free access to education for Ukrainian children.

OPINION CORNER

Dmytro Povreznyuk
Talks about Migration, Refugees, Social Policy



Russia wanted to **disrupt Europe and Ukraine** with the **refugee crisis** in similar way as it was during the Middle East refugee crisis. However, **Europe demonstrated full solidarity with Ukraine** and helped to host **over 7 million refugees** mostly women and children with full financial and humanitarian support. Ukraine on other hand managed to place internally displaced people in the Western part of the country.

DECREASE IN LABOUR SHORTAGES AND THE INFLUX OF SKILLED TALENTS ARE KEY LONG-TERM BENEFITS

Post Soviet Time
(1991 - 2014)

Military aggression
2014 - 2022

Full-scale war
(February 2022 – ongoing)

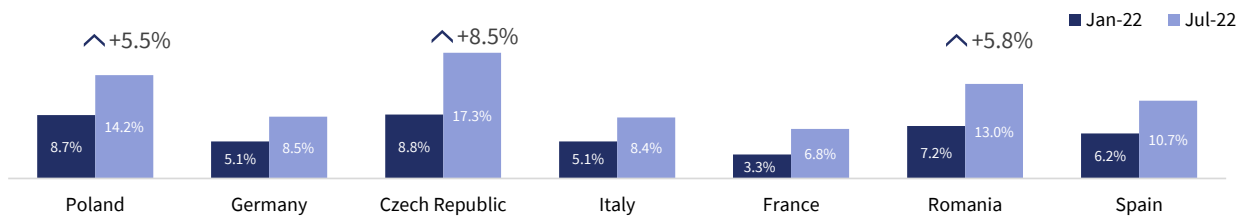
A huge inflow of Ukrainian refugees appeared to be a **challenge** for EU countries. After the experience of the Syrian refugee crisis in 2015, European countries **expect a negative impact** of the influx of Ukrainian refugees on their economies, e.g., through an increase in budget expenditures and growing inflation. However, accepting Ukrainian refugees also creates **opportunities that the hosting countries can benefit from**.

While the negative effects of hosting Ukrainians are expected in the short term, host countries might benefit from the gradual integration of Ukrainian refugees in the long run.

Growing inflation

A sudden surge in demand for housing, fuel, food, and healthcare services leads to **supply shortages** and drives **inflation to go up**. The highest inflation is recorded in the neighbouring countries of the **Czech Republic, Poland, and Romania**. However, the main driver of growing inflation remains the **energy crisis caused by Russia**.

Inflation rate in selected EU countries



Large budget expenditures

Host countries are experiencing a sharp increase in spending from government budgets due to providing support for refugees. However, according to estimations of the Kiel Institute, the cost of assistance to refugees **did not exceed 1% of GDP** in each of the hosting countries in March - August 2022 due to **strong support from sponsors and international organisations, as well as the willingness of Ukrainian refugees to work**.

Competition in labour markets

Employment of qualified refugees may **complicate the competition** in the labour market. There is currently increasing demand for Ukrainian **IT specialists**. Nevertheless, the biggest impediment to the employment of Ukrainian refugees is the **language barrier**.

Decrease in labour shortages

Refugees can **close the gap in low-paid or low-skilled jobs** where developed countries face labour shortages. According to the Polish government, almost **half of Ukrainian refugees are blue-collar workers**, while the remaining ones are employed as office workers, specialists, or technicians.

Previous employment of Ukrainian refugees, Top-5 sectors as of August 2022¹



An influx of skilled talent

Many universities in the EU provide **support for Ukrainian students**. Some universities allow undergraduate students from Ukrainian universities to **continue their studies in Europe**, while others offer **scholarships and grants**. With gradual integration, young talent and experienced professionals with strong STEM² skills may contribute to the **development of the European technology sector**.

Acceleration of scientific progress

The integration of Ukrainian students & academics in hosting countries could **boost scientific development**. The EU has promptly set up initiatives aimed at supporting Ukrainian researchers: **MSCA4Ukraine** provides fellowships for doctoral candidates and post-doctoral researchers, and **Science for Ukraine** offers job and further research opportunities for Ukrainian scientists.

Negative impact

Positive impact



Russian missile strikes might heavily undermine the heating season



We saw it in the Dnipropetrovsk region already. The Russians will resort to this in the future, during the heating season throughout Ukraine. That is why, understanding this, from the very beginning of the second stage of the war, which has been going on since 2014, we appealed to our international partners for help in closing the Ukrainian sky. We asked to close the sky precisely to prevent casualties among the civilian population and the destruction of civilian infrastructure.

DMYTRO LUBINETZ

Commissioner for Human Rights of the Verkhovna Rada of Ukraine

Involvement during Russia's war against Ukraine: Dmytro Lubinets holds an active social position by raising awareness of Russia's war against Ukraine, giving special attention to the challenges that Ukraine faces daily, the issues of the release of prisoners, as well as systematic violations against the civilian population. Also, he calls on the world to prevent the execution of Ukrainian prisoners of war.

As of July 2022, more than 1.5 million Ukrainians left for Russia, voluntary or coercive. In your opinion, how should Ukraine ensure the observance of the rights of Ukrainians in Russia?

Russian Federation forcibly deported and continues to deport Ukrainian citizens to its territory by simply not giving them the opportunity to leave the temporarily occupied Ukrainian territory and go straight to Ukraine.

People go through a filtering process. It begins with the fact that all family members must go to a certain room if they want to leave together. In that building, they are automatically detained, all their documents are taken away, they are taken to different rooms. Men are kept separately from women and children. We have mass evidence that everyone is being stripped down to their underwear, looking for marks from the use of weapons. After that, they conduct interrogations and compare the answers to the questions.

The Government of Ukraine states that there will be a difficult heating season ahead with low temperatures, what is the reason for this?

The heating season will be extremely difficult. And this is not because we may not have enough gas or electricity. The Russian Federation is already directing its missiles at the infrastructure that provides heating for the civilian population and power plants.

We saw it in the Dnipropetrovsk region. The Russians will resort to this in the future, during the heating season throughout Ukraine. That is why, understanding this, from the very beginning of the second stage of the war, which has been going on since 2014, we appealed to our international partners for help in closing the Ukrainian sky. We asked to close the sky precisely to prevent casualties among the civilian population and the destruction of civilian infrastructure.



The main challenge for us is the safety of children



The main challenge for us is, of course, the safety of Ukrainian children. The risk of rocket attacks remains all over Ukraine, and the enemy continues to apply psychological pressure by targeting crowded places, schools and kindergartens. However, having seen how hard it is for children to stay in shelters all the time, we decided to take the children out of the cities (towns) to the countryside complexes, where they can have a proper rest and an emotional release. This is very important because they have recently arrived from regions and areas where active fighting takes place. They are shutting themselves, being in a constant state of anxiety.

OLEKSANDRA KARPENKO

National Reforms Council under the President of Ukraine

Involvement during Russia's war against Ukraine: Since the beginning of the full-scale Russian invasion, Oleksandra has led several humanitarian initiatives: evacuation of the Ukrainian settlers from the hot spots to Warsaw, organisation of shelters for internally displaced persons in Dnipro, supervising educational projects for displaced children. In addition, Oleksandra manages the War Crimes investigation project.

You help internally displaced families and their children. Now, how many families and children have you been able to help?

As of September 2022, we were able to help around 120 displaced children of ages 6 to 16. Together with the Logos Centre for Applied Education, we organised one shift of a summer children's camp and three shifts of a day education camp. Every day the teachers worked hard to bring the children back to life and to teach them new ones. Activities included: art therapy, swimming pool, spoken English, mathematics, Ukrainian, fashion shows, workshops, various training sessions, vocals, magic chemistry, salt caves, sports tournaments, creative activities, board games, field trips, acting classes, parodies and a lot more. Our mission was to give the children psychological support and help them to start the school year in a stable emotional state.

During the war you organise summer camps and kindergartens for children. Do you have any plans to help children in other fields?

The school year has begun, so we have many plans for the educational development of children. Housing, employment, and socialisation remain the main problems for internally displaced parents and children. People found themselves in an extremely difficult situation when they need to take care of their child(ren), get used to a new environment, look for housing and how to make their living. It is gratifying that there are already many initiatives in this direction, but so far it is not enough to help everyone who needs it. In particular, there is a lack of projects for the construction of social housing – I think this is what the state can help with.



Staying at home for some people is the only way to a better mental health



Almost every day I recollected Benigni's film 'Life is Beautiful', which I watched back in the late 90s. Could I have thought then that the film about the stay of a Jewish father with his young son in a fascist concentration camp would become my instruction, manual for survival so that when the war is over, we all remain sane?

KHRYSTYNA VLASOVA

Mother of two boys, decorator, and interior designer

Involvement during Russia's war against Ukraine: Since the beginning of the war, me and my husband, have supported local Territorial Defence Forces. We have helped pensioners, fed cats living in the streets, donated to the Armed Forces of Ukraine. We collected money for a sniper's rifle, for surgery for a man from the city of Nova Kakhovka, collected things for displaced people from Mariupol, and helped in setting up the hub.

Currently, all Ukrainians are going through a difficult stage of their lives, which is reflected in particular in their psychological state. Do you observe such changes in your children?

At the time of the full-scale invasion, our boys were 5 and 7 years old: they were no longer too young to be fully involved, worry, and mirror the mental state of their parents, but at the same time not mature enough to reflect on events that surrounded them. They cannot realise the war to the extent an adult can. Nor do they have the experience of a loss and the understanding of death. I believe that we are lucky - they have not seen death with their own eyes and do not follow the news yet. All they experience empirically is the sounds of sirens and explosions. When I was scared, they rather felt curious.

We slept in our little hallway over the course of the first 40 nights. One day a rocket landed relatively close to us (we live in Kyiv, Lukyanivka district), and our youngest said: 'Mom, do you remember how much afraid I was of fireworks? I am not afraid of them anymore.' I never wanted my child to get rid of phobias in such a perverse way. It is very painful.

I could see that my kids had no fear, and this allowed me not to leave everything, not to run, but to stay in the city, next to my husband. It was important for me to be near him, to be in my place, on my land, in the best city of the world — in my mystical and extremely powerful Kyiv. Together with my husband, we chose the only way to save ourselves – to be here and help others. Did the war affect our children? I think they grew up way too fast.

THE UKRAINIAN LABOUR MARKET IS CHARACTERISED BY HIGH LABOUR MIGRATION

The Ukrainian labour market had evolved gradually, having passed from agriculture to industry-oriented, as was when the country was a part of the USSR. After its breakdown, Ukraine stepped on the path of a service-oriented economy, with the national labour market increasing its focus on the wholesale and retail trade, as well as the agriculture and manufacturing sectors.

Political and economic instability after 2004, 2008, and 2014 has led to **rapidly increasing labour migration of both skilled and unskilled workers**, forcing them to leave the country in order to find more reliable sources of income. In addition, exploitation of workers and an extensive underground economy are still common issues that need to be addressed.

Key Ukrainian labour market figures in 2021



Top-3 sectors by the average wage in 2021

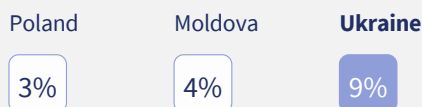


Unemployment rate by selected countries in 2021

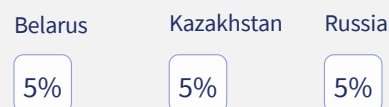
Eastern European countries



Neighbouring countries



Former Soviet Union countries

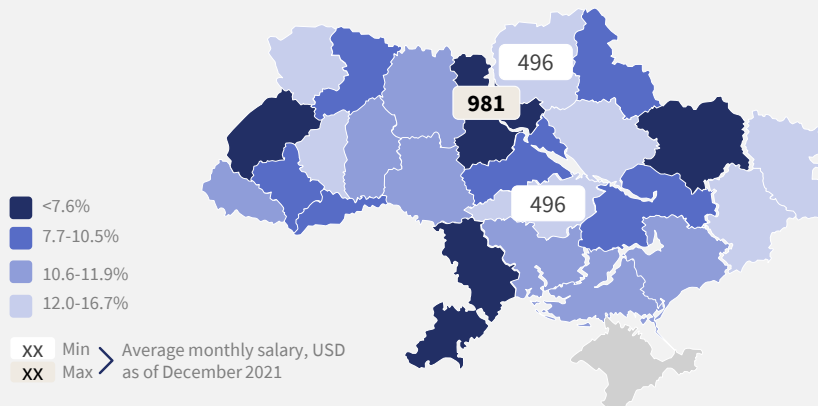


In 2021, **16 million people were officially employed in Ukraine**, with an employment rate of 56%.

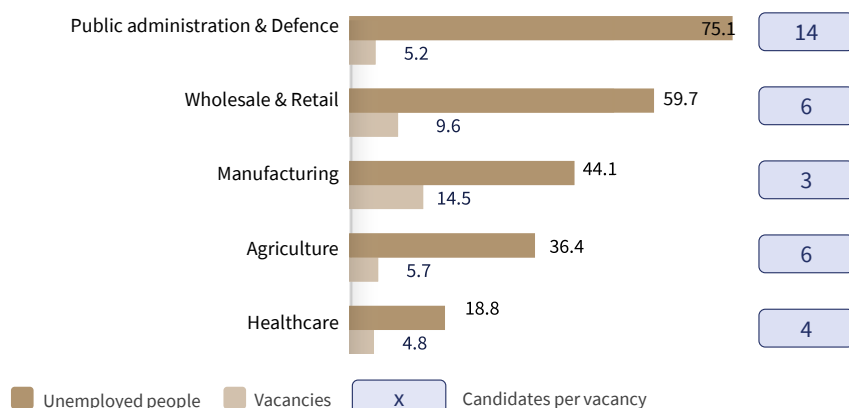
The largest share of the employed population **worked in the wholesale and retail trade, as well as the agriculture and manufacturing sectors.**

Kyiv, Kharkiv, Lviv, and Odesa regions registered the lowest unemployment rates in Ukraine. At the same time, there were **significant regional disparities in salaries**, with the highest average wage in Kyiv and the lowest in **Chernihiv, Kropyvnytskyi, and Ivano-Frankivsk regions.**

Unemployment rate of the working-age population in 2021



Top sectors by the number of unemployed people, thousand of people / vacancies¹, as of June 2021

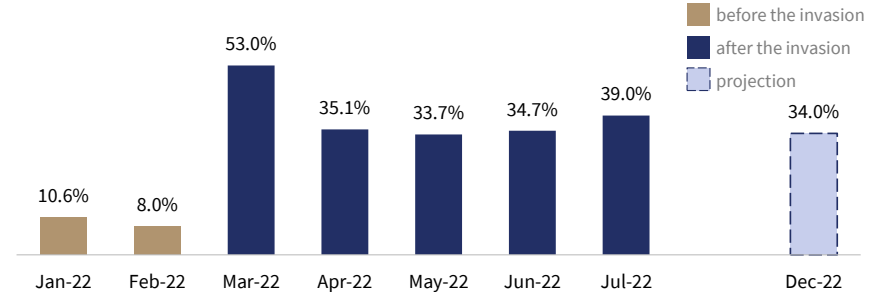


On 1 June 2021, the **largest number of the unemployed population** was registered in the **public administration & defence sector due to the civil service reform**, while the **manufacturing sector had the largest number of vacancies. As well as public administration and defence**, the competition in the workplace was the most intense in **financial services and insurance. The least number of people per workplace** was registered in **the mining and water supply trade, as well as the utility sectors.**

ALMOST A THIRD OF UKRAINIANS HAVE LOST THEIR JOBS SO FAR DUE TO THE RUSSIAN INVASION

Since the beginning of the war, **almost 30% of Ukrainians have lost their jobs** due to a steep decline in economic activity and displacement, considering the security risks. The **number of Ukrainians returning to work rose** compared to March 2022. However, the **National Bank of Ukraine reported a record increase in the unemployment rate**. Still, temporarily occupied territories and active combat zones remain areas where employers **cannot offer proper working conditions**.

Share of unemployed population in Ukraine (data based on non-official surveys and NBU report)



Changes in the labour market of Ukraine, as of 1 August 2022 vs 1 February 2022

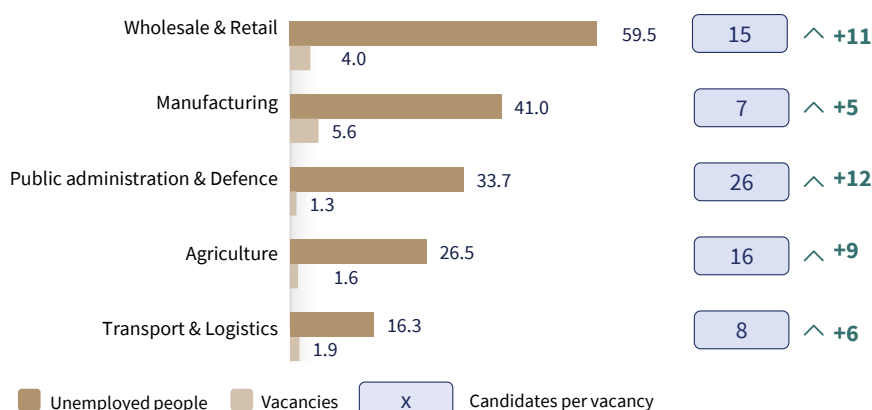


Measures taken by businesses because of the war, share of companies¹



The labour market of Ukraine **was adversely hit by the Russian invasion**. According to the Ukrainian personnel portal, Work.ua, **the number of vacancies dropped by more than 14 times** at the beginning of March 2022 compared to the pre-war period. Companies were forced to **cut salaries or cancel bonuses**, send workers on **vacation at their own expense**, **fire employees**, or even **stop operations completely**.

Top sectors by the number of unemployed people, thousand of people / vacancies², as of August 2022³

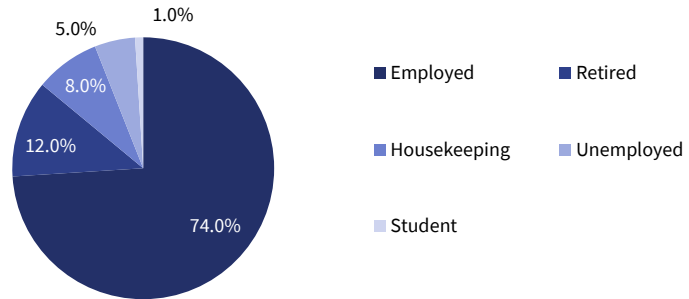


As of August 2022, **the average salary comprised 380 USD** per month, a **25% decrease** compared to the pre-war level. At the same time, **the number of candidates per vacancy rose by 2 times**. In August 2022, **the highest competition** for a workplace was registered in the **financial services & insurance trade** (70 people per vacancy) and in **public administration & defence**. As of August 2022, **more than 16 thousand unemployed people were conscripted to military service**, and nearly **13 thousand were employed** in the public administration & defence sector.

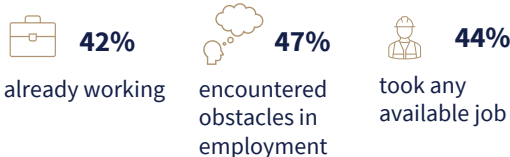
AROUND THREE MILLION PEOPLE OF WORKING AGE FLED ABROAD AFTER THE RUSSIAN INVASION

Since the start of the war, more than **7 million¹ refugees have left Ukraine**. The majority of refugees are women, children, and men over 60. Around **84% of refugees are of working age, many of whom have lost their jobs** or had to resign due to the war. This caused an unexpected employment crisis, while **the neighbouring countries** are now facing rather significant **labour market integration challenges**.

Ukrainian refugees by employment status before the war, as of August 2022

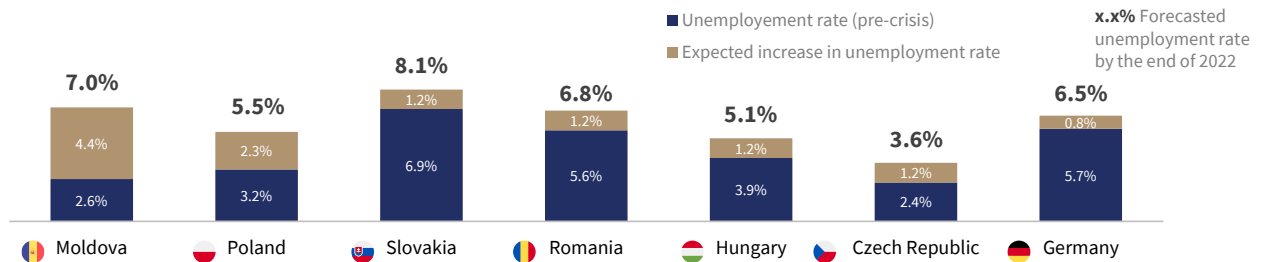


Survey of Ukrainian refugees regarding job search²



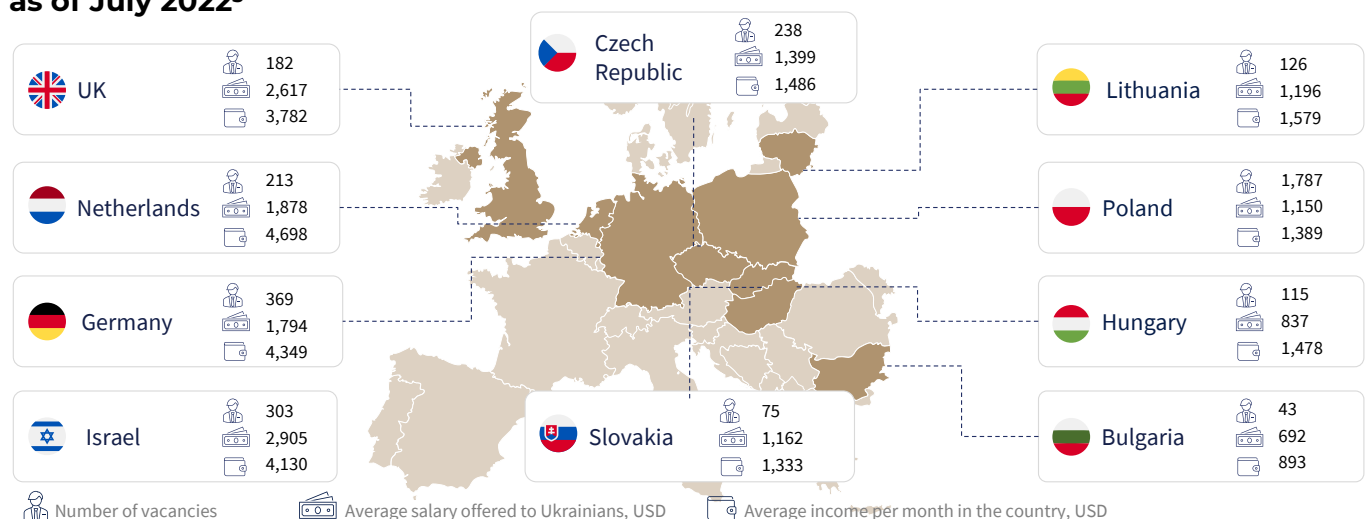
Unlike refugees from other countries, **Ukrainians immediately began to integrate into society**. To support this, the European Union **simplified the job search process** after the registration of the migrant worker or temporary protection status. Despite a significant share of refugees finding work, **many Ukrainians faced several difficulties in their job search**. The majority of those who encountered obstacles in employment **determined that the language barrier was a top impediment**.

Refugee crisis impact on local labour markets²



The **employment crisis in Ukraine** caused by the Russian invasion might also create **labour disturbances** in the neighbouring countries, mainly **Moldova, Poland, Slovakia, Romania**, and in **Hungary**. The longer hostilities continue, the longer Ukrainian refugees **would be forced to remain in exile, putting additional pressure** on the **labour markets and social security systems** in the hosting countries. Moreover, Ukrainians are generally offered **lower salaries** than average in other particular countries. This situation could **cause an additional imbalance** in the labour market and **escalate competition among local candidates**.

Top-10 countries by the largest number of vacancies offered to Ukrainians, as of July 2022³



Number of vacancies Average salary offered to Ukrainians, USD Average income per month in the country, USD



There is a low level of trust between entrepreneurs and state authorities



The main problem in organising cooperation between businesses and public authorities is a low level of trust. Recently, we have been trying to change it and persuade businesses that we have one common goal: to ensure compliance with legislation, stability of operation and development of an enterprise, as well as creation and preservation of jobs.

IHOR DEGNERA

Head of the State Labour Service of Ukraine

Involvement during Russia's war against Ukraine: Under martial law, one of the main factors for victory is to support the Armed Forces of Ukraine. Paying taxes is more important than ever. The State Labour Service of Ukraine actively supports employers and employees by providing consultations on such important issues as labour relations during the martial law period, as well as providing advice to refugees on the safe job search.

What are the prospects and priorities of the State Labour Service of Ukraine after the war?

As soon as Ukraine wins, the efforts of the State Labour Service will be directed to assist in restoration of the economy, in line with the requirements of the law. Many years of experience show that once a mechanism is set up, it can operate for many years. We plan to carry on the implementation of projects in the field of advisory services to employers and online consultations. In addition, a set of measures is being developed, aimed to remove the practice of undeclared labour as much as possible. In such a civilised country, there is no room for impeding economic development, as well as preventing workers and employers from building their relations on the principles of partnership and mutual respect.

We also plan to wage an information campaign, targeted at forming and strengthening public respect for the labour protection law.

On 1 July 2022, the information campaign 'Go to Light!' was launched. In your opinion, how effective is it?

Undeclared labour relations give employers unlimited opportunities to exert pressure on workers, and facilitate tax evasion. It also reduces revenues to the national and local budgets. People working unofficially are deprived of their right to decent working conditions, protection of their interests at work and guarantees of social protection.

According to the most recent data published by the State Statistics Committee, the share of the unofficially employed was 17.6% of the total working population.

During the campaign, labour inspectors visit employers, inform them about the requirements of the law, and then monitor the state of their labour relations. Since the beginning of the campaign, 42,000 information visits to employers have been made, with 23,000 workers legalised by their employers.

FOR AGES UKRAINIANS HAVE BEEN FIGHTING FOR THEIR CORE VALUES – FREEDOM, JUSTICE, SAFETY

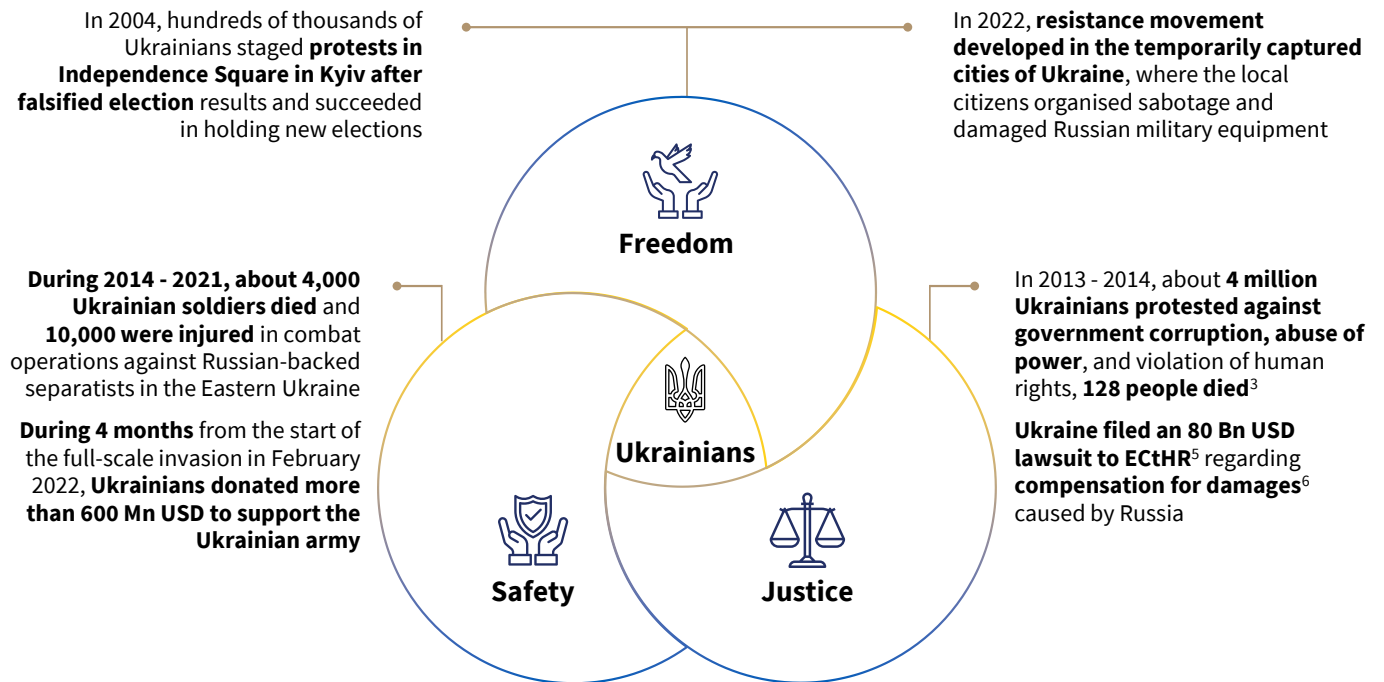
Freedom, justice, and safety are the fundamental values of different generations of Ukrainians. These social values have been shaped throughout the centuries, as Ukraine was occupied for a long time, initially by the Russian Empire and later by the Soviet Union.

Since the start of the full-scale Russian invasion in February 2022, millions of Ukrainians have stood up for their core values by

defending the country, supporting the army, and volunteering. In May 2022, **more than 95% of Ukrainians referred to freedom among their main values**¹.

Additionally, **82% of citizens consider democracy as an indispensable form of governance**, fighting for it during the Soviet repressions, revolutions in 2004² and 2013 - 2014³, and in the war against Russia in 2022.

Key values of Ukrainians⁴



Global manifestation of Ukrainian identity

Colours of Ukraine

In May 2022, the Pantone Colour Institute showed support for Ukraine by posting the colours of the Ukrainian flag, naming them Freedom Blue and Energising Yellow.

Be Brave Like Ukraine

In 2022, Ukraine launched an international advertising campaign about the bravery of Ukrainian people, placing billboards on the streets of more than 15 countries worldwide.

OPINION CORNER

Diana Sudareva
Talks about National Consciousness, Ukrainian Identity, Values, and Dignity



For many Ukrainians, Russian full-scale invasion on 24 February 2022 was **a point of no return in many ways**. More and more **citizens switch to the Ukrainian language**, more and more songs in Ukrainian appear on music charts, society feels not only emotional upliftment but also unity and deep respect and honor for others. **Ukrainians once again have to defend their core values**, and this time, it is happening in a war started by a neighboring terrorist state. The **bravery, dedication, and courage of Ukrainians leave no doubt about our victory**.

Source: Rating Group website; The United Nations Development Programme (UNDP) website; Pantone website; Brave.ua website; Media overview
Notes: (1) According to Rating Group survey among 1,000 respondents, conducted in May 2022 in all regions except for the temporarily occupied territories of the Crimea and Donbas; (2) Orange Revolution; (3) Revolution of Dignity; (4) According to UNDP survey, n=2,002, conducted in December 2020; (5) European Court of Human Rights; (6) During 24 February 2022–7 April 2022

THE UKRAINIAN LANGUAGE WAS BANNED BY THE RUSSIAN EMPIRE AND LATER BY THE SOVIET UNION


Throughout the centuries, the Ukrainian language, as the main component of the Ukrainian identity, was suppressed and banned by the Russian Empire and later again by the Soviet Union. Those who spoke or wrote in Ukrainian were persecuted, punished, or killed.

Selected examples of suppressed Ukrainian cultural organisations

- **Brotherhood of Saints Cyril and Methodius.** The first secret Ukrainian political organisation, based on traditions of the Ukrainian liberation movement, was quickly suppressed by the authorities in **1847**, with most of the members being exiled or imprisoned
- **Executed Renaissance.** Generations of Ukrainian-language poets, writers, and artists of the **1920s and early 1930s**, who created highly artistic literature, painting, music, theatre, and cinema works, were murdered during the Great Terror¹
- **Sixtiers.** The generation of the Ukrainian national intelligentsia of the **1950s - 1960s**, with a pronounced civic position, was destroyed or driven underground by arrests during a decade

 **134**

bans on the Ukrainian language have been recorded over almost 400 years

 **11 years**

spent by Taras Shevchenko² in exile, without the right to write and paint³

 **80%**

of creative Ukrainian influencers were suppressed or killed in the 1930s

 **Over 25**

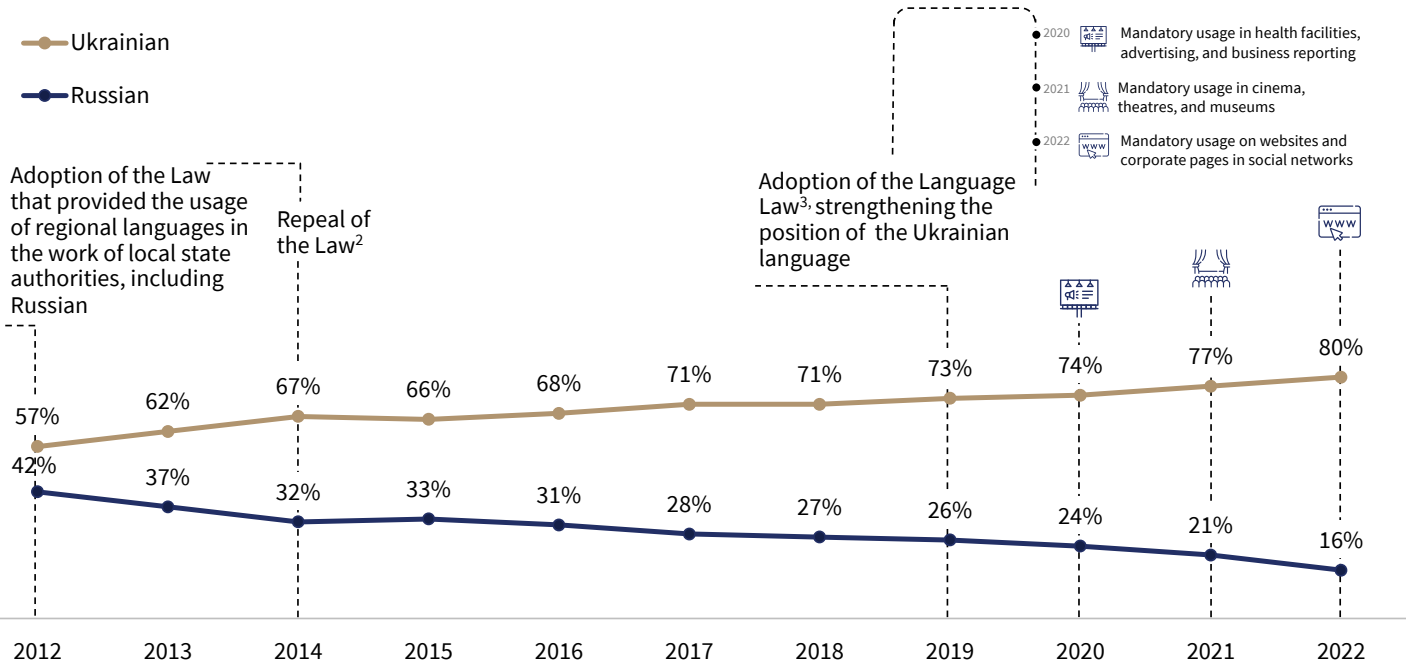
Ukrainian cultural figures were arrested in August - September 1965

Selected cases of Ukrainian language suppression

- **1720**
Decree of Peter I, Monarch of the Tsardom of Russia and later the Russian Empire⁴, prohibited book printing in Ukrainian and forced the removal of Ukrainian texts from church books
- **1863**
'Valuev circular'⁵ banned publication of religious, educational, and literature recommended for the use in primary literacy training in the Ukrainian language
- **1876**
Emsky degree of Alexander II, Emperor of Russia⁶, prohibited musical works and stage performances in Ukrainian, as well as the printing and importing of any sort of Ukrainian literature
- **1881**
Prohibition of teaching in elementary schools and the conduction of church sermons in the Ukrainian language
- **1914-1916**
Russification campaigns in Western Ukraine aimed to ban the Ukrainian language, as well as education and church
- **1929**
Arrests of Ukrainian scientists and clergy, as well as their replacements, by Russian-speaking figures
- **1958**
Resolution of the Plenum of the Central Committee of the CPSU⁷ on the transition of Ukrainian schools to the Russian language of tuition
- **1970**
Order of the Ministry of Education of the USSR to write and defend thesis only in Russian, with approval only in Moscow
- **1990**
Adoption of the Law on Languages of the USSR nations, granting official status to the Russian language across the entire territory of the Union

DESPITE ALL ATTEMPTS, THE SHARE OF UKRAINIAN-SPEAKING PEOPLE HAS BEEN RISING SINCE 2012

What language do Ukrainians consider to be native?¹



As Ukraine declared its independence in 1991, an increasing amount of its **citizens claimed Ukrainian as their native language**. The share of the population speaking Ukrainian at home also increased, while the usage of Russian as the main language decreased. The **current Language Law, adopted in 2019, strengthened the position of the Ukrainian language** and provided its mandatory usage in public administration, services, education, and media. The share of Ukrainians who read in the

Ukrainian language increased from 24% in 2014 to 36% in 2020, while Russian-language literature was preferred by only 24% of readers in 2020, compared to 44% in 2014⁴. In 2022, **83% of citizens wanted to see Ukrainian as the only state language**, compared to 47% in 2014⁴. In addition, the Russian invasion of Ukraine in February 2022 **extremely strengthened the position of the Ukrainian language**, stimulating even those who never spoke Ukrainian to switch to it on a permanent basis.

Selected cases of the ban and persecution of Ukrainian language since the beginning of the war in the temporarily occupied territories

Destruction of Ukrainian books

Seeking and burning historical books and books in the Ukrainian language by Russian occupiers



Seizure of Ukrainian historical and fiction literature from the libraries in the temporarily occupied territories of the Luhansk, Donetsk, Chernihiv, and Sumy regions

Studying by Russian curriculum

Compulsion to study in accordance with the Russian curriculum and standards at schools and kindergartens



The Russian Ministry of Education announced that from 1 September 2022, **schools** in the temporarily occupied cities of the Zaporizhzhia region would **have to work under Russian standards**

Pressure on school workers

Kidnapping people because of their unwillingness to cooperate with Russian occupation forces



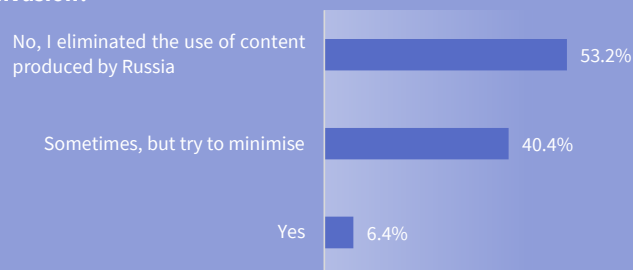
Kidnapping of the Head of the Education department and three school principals who refused to cooperate with the Russian occupiers in temporarily occupied Melitopol in March 2022

Source: Rating Group — The 10th national survey: Ideological markers of the war — [April 2022]; Verkhovna Rada of Ukraine website; VoxUkraine website; Media overview
 Notes: (1) According to the Rating Group national survey, conducted in all regions except for the temporarily occupied territories of the Crimea and Donbas, n=1,000; (2) Declared unconstitutional in 2018; (3) Provides for the gradual entry into force of its provisions by 2030; (4) According to Info Sapiens and GFK surveys, n=751 for 2020, n=1,000 for 2014

THE RUSSIAN INVASION CAUSED THE REVALUATION OF NATIONAL CULTURAL VALUES BY UKRAINIANS

More than 90% of Ukrainians either eliminated or minimised the use of the content produced by Russia after the beginning of the war. There are numerous evidences how Russia has used the culture (films, music, literature etc.) as a part of its propaganda and the hybrid aggression tool. Therefore, the majority of Ukrainians are trying to overcome the impact of the enemy on cultural sphere.

Do you continue to use the content produced by Russia after the invasion?¹



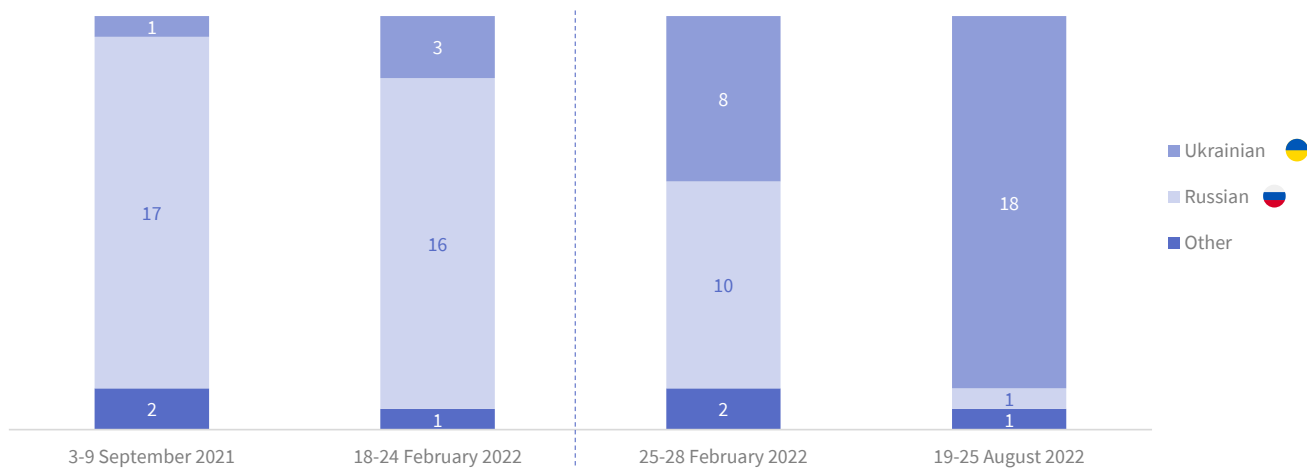
29.0%

share of Ukrainians who have switched from Russian to Ukrainian language following the full-scale invasion¹

After the start of the full-scale Russian invasion, **29.0% of Ukrainians switched from Russian to Ukrainian language**, which demonstrates the growing awareness of people regarding their national identity. Moreover, the majority of Ukrainians understand that the enemy is using language and other cultural matters as weapons of the hybrid war.

The rising cultural self-awareness of the Ukrainians has also reflected in the **increasing volume of content (in particular songs and videos) produced in Ukrainian**, as well as in the growing popularity of this content among the Ukrainians. For example, almost a year ago in September 2021, 17 out of 20 most popular songs on YouTube in Ukraine were in Russian language, while **in August/September 2022 the situation is absolutely reverse – 18 out of 20 most popular song are in Ukrainian**.

Top-20 popular songs in Ukraine according to YouTube charts, by language



The level of unity among the Ukrainians has increased since the beginning of the war according to almost 90% of respondents. Most people demonstrated an outstanding support of each other and the defenders amid the attempt of the Russian occupiers to destroy the Ukrainian nation and the sovereignty of the country.

?

In your opinion, has the level of unity among the Ukrainians changed since the invasion?¹

88.0%
Yes, it has increased

7.0%
No, it has remained unchanged

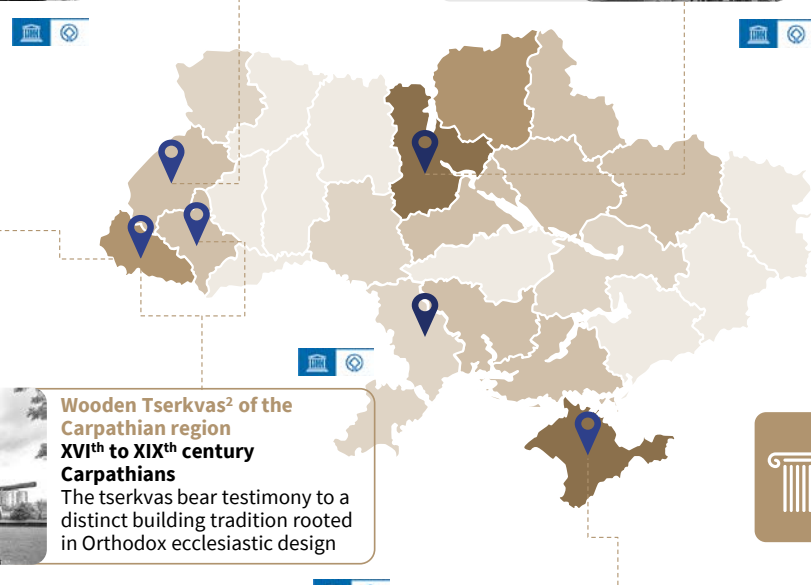
5.0%
Yes, it has decreased


UKRAINE HAS UNIQUE CULTURAL SITES, WITH 7 LANDMARKS LISTED IN UNESCO WORLD HERITAGE

Ukraine's architecture and arts represent a legacy of many historical periods and reflect both the international cultural footprint and the authentic Ukrainian-inherent charm. Ukrainian cultural heritage is globally recognised, with seven locations in


Ukraine being inscribed on the UNESCO World Heritage List: six of them are cultural locations, and one is a natural sight. The UNESCO Intangible Heritage List also contains five cultural elements of Ukrainian origin.

Cultural heritage in Ukraine






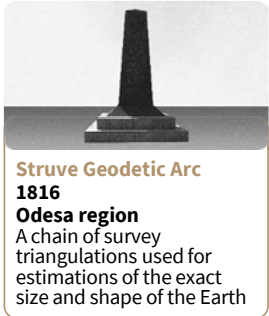
Ensemble of the Historic Centre
Late Middle Ages
Lviv
The Old Town of Lviv is the historic centre of the city with unique architecture



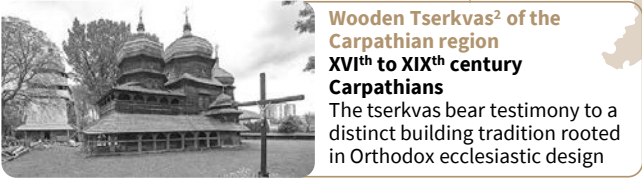
Kyiv-Pechersk Lavra, Saint-Sophia Cathedral,
Early XIth century
Kyiv
Spiritual and intellectual centre of the Kyivan Rus' and Hetmanate




Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe



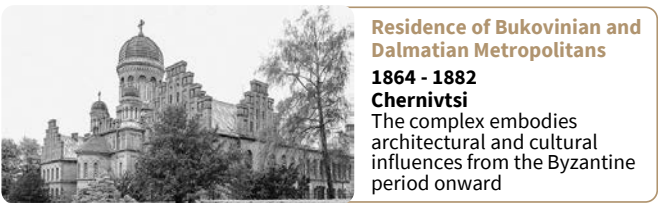
Struve Geodetic Arc
1816
Odesa region
A chain of survey triangulations used for estimations of the exact size and shape of the Earth



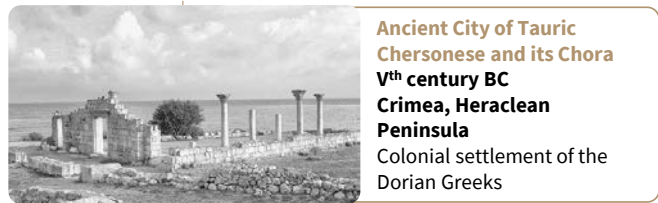
Wooden Tserkvas² of the Carpathian region
XVIth to XIXth century
Carpathians
The tserkvas bear testimony to a distinct building tradition rooted in Orthodox ecclesiastic design



1,157 objects of cultural heritage of national significance

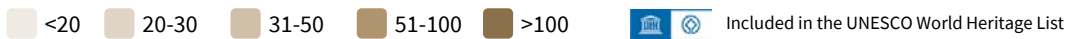


Residence of Bukovinian and Dalmatian Metropolitans
1864 - 1882
Chernivtsi
The complex embodies architectural and cultural influences from the Byzantine period onward



Ancient City of Tauric Chersonese and its Chora
Vth century BC
Crimea, Heracleon Peninsula
Colonial settlement of the Dorian Greeks

Number of objects of cultural heritage of national significance¹:



UNESCO intangible cultural heritage elements of Ukrainian origin



Petrykivka decorative painting
A style of ornamental painting with a high degree of symbolism
2013³



Cossack's songs of the Dnipropetrovsk region
The songs tell stories of war and family relationships
2016



Tradition of Kosiv painted ceramics
The tradition rose in the XVIIIth century and involved using clay
2019



Ornek, a Crimean Tatar ornament
A system of symbols and their meanings currently used in embroidery, weaving, pottery, and engraving
2021



Culture of Ukrainian borscht cooking
Variations of borscht can include mushrooms, fish, or sweet peppers, but necessarily — a beetroot
2022

DID YOU KNOW THAT THE TALLEST STATUE IN EUROPE IS LOCATED IN UKRAINE ?

The **tallest monumental sculpture in Europe** is **Motherland in Kyiv**, with a **height of 62 metres**. The Motherland Monument holds a 16-metre-long sword in one hand and a 96 m² shield in the other.

The highest statues¹ in Europe



62 m

The Motherland Monument
Kyiv, Ukraine



40 m

Atatürk Mask
Buca, Türkiye



36 m

Christ The King
Świebodzin, Poland



35 m

Birth Of The New Man
Seville, Spain



33 m

Our Lady of the Sacred Heart
Maribel, France



THE RUSSIAN ARMY HAS PARTIALLY OR TOTALLY DESTROYED 186 CULTURAL SITES



...any damage to cultural property, irrespective of the people it belongs to, is a damage to the cultural heritage of all humanity, because every people contributes to the world's culture...

Preamble of the 1954 Hague Convention¹



79

religious buildings²



32

cultural centres



36

historical buildings



17

monuments



13

museums



9

libraries

Actions taken by Ukrainians to preserve cultural heritage during Russia's war against Ukraine

In March 2022, volunteers from the international project **Save Ukrainian cultural heritage online** created a digital archive of the majority of Ukrainian cultural heritage objects. The team of more than **1,300 cultural heritage professionals** – librarians, archivists, researchers, and programmers – saved more than 50 TB³ of scanned documents, artworks, and many other digital materials from more than 5,000 websites of Ukrainian museums, libraries, and archives.



To cover the stained-glass windows of the **Kyiv funicular** with special shields, volunteers collected **9,441 USD⁴** of **donations from 662 people** in March-April 2022. Thus, the windows of the upper station were covered with 12 wooden shields, strengthened with fire-proof tarpaulin and galvanised iron sheets. Similar works were carried out at the lower station. The protection of the stained glass windows **took more than a month**.

Many **monuments in Ukraine are protected by structures made of bags of sand**. Large monuments, such as the one dedicated to Knyahynya (Queen) Olha and Volodymyr the Great in Kyiv, as well as smaller monuments, such as the one dedicated to Dante Alighieri have been closed. Odesa residents have also hidden the main monument of the city — Duke de Richelieu. The **smaller monuments were dismantled and carried away** to safer places.





Nothing Ukrainianises Ukrainians as much as Putin's missiles and shells



The major difference between Ukrainians and Russians is not the language, religion or culture, but it lies in different political traditions and relations between the authorities and the population, the state and the society. Ukrainians have never treated power as something sacred, but often as something alien — and therefore they have had a strong experience of self-organisation, which the Russians do not have. In modern conditions this formula can be rewritten as follows: in Ukraine someone like Putin or Lukashenko is impossible (Yanukovich tried two times, but failed), while in Russia impossible is something like the victorious Maidan.

DR YAROSLAV HRYTSAK

Historian; Doctor of Historical Sciences; Professor of the UCU, Lviv

***Involvement during Russia's war against Ukraine:** Dr Yaroslav Hrytsak highlights facts on the Ukrainian history, comments on the situation in the country after the full-scale invasion, and considers the war from a historical perspective. In addition, he gives interviews to raise awareness about Ukraine: its history and identity.*

In your opinion, what can be characterised as a Ukrainian identity? How has it changed since the Declaration of Independence in 1991, especially since the start of the full-scale invasion?

The major difference between Ukrainians and Russians is not the language, religion or culture, but it lies in different political traditions and relations between the authorities and the population, the state and the society. Ukrainians have never treated power as something sacred, but often as something alien — and therefore they have had a strong experience of self-organisation, which the Russians do not have. In modern conditions this formula can be rewritten as follows: in Ukraine someone like Putin or Lukashenko is impossible (Yanukovich tried two times, but failed), while in Russia impossible is something like the victorious Maidan.

Since 1991, the number of those who consider the Ukrainian language their native language has been steadily growing. In your opinion, what are the main factors influencing this trend?

The number one contributing factor is the emergence of Ukraine as an independent state. The existence of independent Ukraine as a new reality inevitably spawns the tendency toward the growth of a Ukrainian-speaking share of the population, especially among the power elite. As far as this factor is concerned, the three-generation rule applies here: full language assimilation is in place among the generation of grandchildren.

The second contributing factor is Russia's policy: nothing Ukrainianises Ukrainians as much as Putin's missiles and shells lately. Famous Ukrainian historian Antonovych compared Ukrainians with the Irish: even if all Ukrainians spoke Russian, it would not make them Russians, just as the English language did not make the Irish English.



There were many attempts to destroy Ukrainian cultural identity



The government should support initiatives aimed at studying the cultural and national identity of the Ukrainian nation, as well as encourage scientific research that sheds light on the historical, cultural, and political foundations of the formation of Ukrainians as a nation. And of course, those things, which are a part of the national pride and characterise Ukrainians the most, should be promoted by the state and incorporated into the country's brand.

DR ANTON DROBOVYCH

Head of the Ukrainian Institute of National Remembrance

Involvement during Russia's war against Ukraine: Dr Anton Drobovych fights in the ranks of the Armed Forces and continues giving expert media interviews online. Recently, Anton became a member of the World Economic Forum in Davos, delivering his speech straight from the trench.

In your opinion, what are the core values of Ukrainians and what factors have influenced their development?

The main ones are freedom, dignity, justice, and self-sufficiency in the understanding of economic independence. A long history of being suppressed by empires and the memory of the glorious times of Cossacks have created an immense desire for freedom – to live as they have decided for themselves, without a king, lord, or oppressor. Such things as rethinking the experience of World War II or the Revolution of Dignity have created strong respect for human dignity, human rights, and the unconditional value of the individual. For a long time, Ukrainian land was in the hands of foreign lords, whose rule provoked an immense urge for Ukrainians to have their land and desire to be economically independent and autonomous.

What explains this permanent desire to destroy the Ukrainian language and why it still exists and develops to this day?

Language is one of the key markers of identity, which is why everyone who established control over Ukrainian territories tried to assimilate the local population and reduce the level of cultural identity, and especially displace the Ukrainian language. This has failed: complete and natural character systems of great communities do not emerge at random; they are formed over centuries; hence it is not so easy to supplant or destroy them. But the main factor of the language's survival is its authenticity and relevance to Ukrainians. It is something intrinsic and important, something that is perfect and different, therefore valuable.



Those who explode with a ‘suppression of russian language’ rhetoric do not read



These trends will continue and I hope that the current dramatic events will add such features as responsibility for one’s choice, as well as an ability to exert consolidated control over authorities. This will be the modernised Ukrainian political nation that is emerging now.

KOSTIANTYN KOZHEMYAKA

President of Fund for Cultural Initiatives ArtHuss

Involvement during Russia’s war against Ukraine: Kostiantyn continues working actively, implements new projects dedicated to modern Ukrainian artists and the Ukrainian culture, making a significant contribution to cultural diplomacy and popularisation of modern Ukrainian art in Ukraine and abroad.

What do you think can be characterised as Ukrainian identity? How has this Ukrainian identity changed since 1991?

In its origins, the Ukrainian identity was shaped by the historical principle and, to a lesser extent, by the geographical principle. Since 1991 a Ukrainian political nation has been formed, based on the identity of the core nation and on the principles and the values, shared by all who live in the country, regardless of their nationality. Such values are freedom, democracy, empathy, inclusiveness, etc.

In 2030, these trends will continue and I hope that the current dramatic events will add such features as responsibility for one's choice, as well as an ability to exert consolidated control over authorities. This will be the modernised Ukrainian political nation that is emerging now.

19 June 2022, Ukrainian Parliament passed a law banning imports of Russian literature. What impact will this decision have?

Same as the visa regime with the Russian Federation, this should have been imposed much earlier. But we should not pin all the blame on politicians, before 24 February 2022 38% of the Ukrainians tolerated Russia with varying degrees of loyalty. Despite that the war has been on for 8 years. We can now witness the process of catharsis. Everything undergoes radical and dramatic changes, including changes of attitude.

Looking at the reading audience of my publishing house, I can assure you that over the last 7-8 years the most active readers seek to read Ukrainian-language publications. And those who shout about the ‘oppression of Russian books’, do not, as a rule, read books at all, neither in Russian nor in Ukrainian.

DID YOU KNOW THAT THE FIRST UNIVERSITY IN EASTERN EUROPE WAS OPENED IN UKRAINE?

1576

Prince Konstantin-Vasily of Ostroh established the Ostroh Academy, the first institution of higher education in Eastern Europe and the oldest Ukrainian scientific and educational institution.

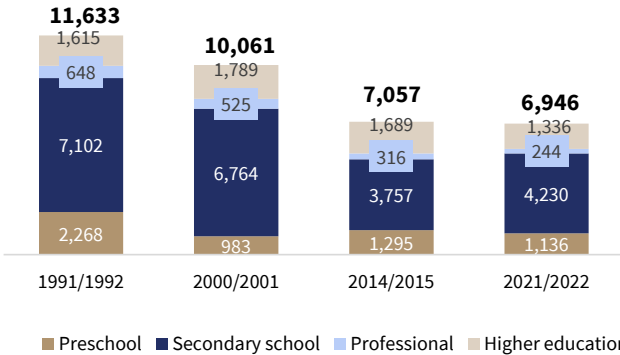


UKRAINIAN FOUR-LEVEL EDUCATIONAL SYSTEM FACES A DECLINE IN STUDENTS

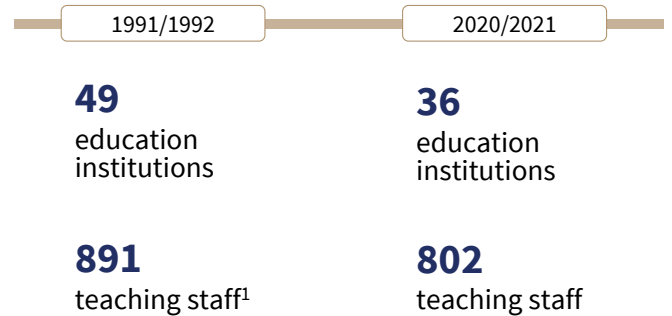
In the early 1990s, the **significant demographic changes and economic recession in Ukraine** led to a reduction in the number of students and, hence, the number of educational institutions and teachers. In 2014/2015, the number of students, teaching staff, and educational institutions further declined due to the

occupation of the territories in the Donetsk and Luhansk regions, as well as the annexation of Crimea. Ukraine's education system comprises four primary levels: **preschool, secondary, professional, and higher education.**

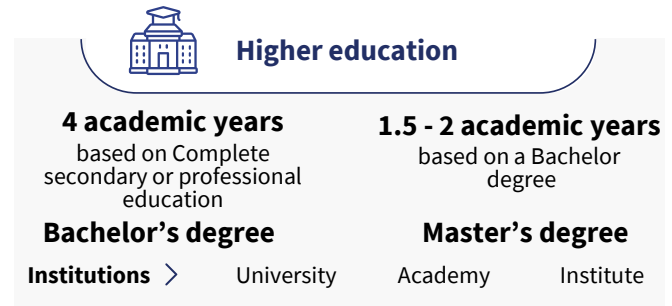
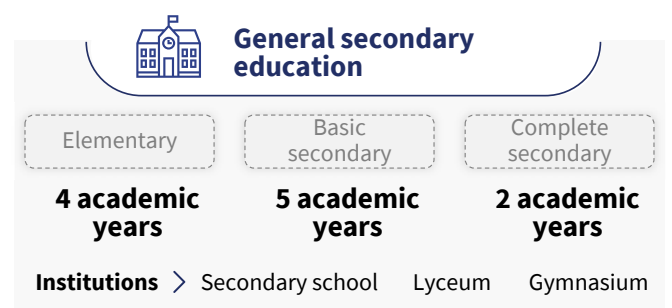
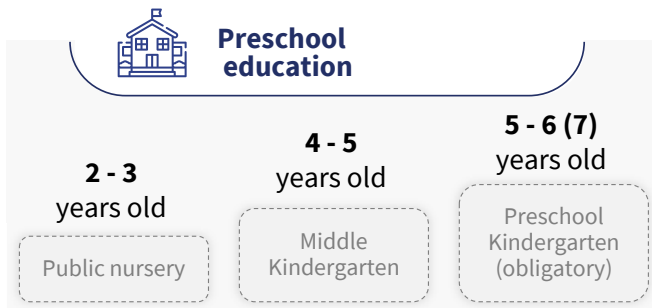
Number of students, thousands



Number of institutions & staff, thousands



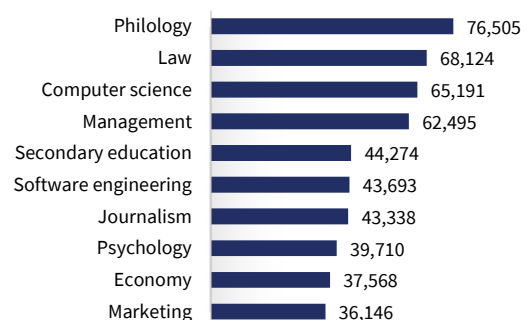
Structure of Ukraine's education system



Top Universities in Ukraine as of 2022

1	651 - 700	Taras Shevchenko National University of Kyiv
2	701 - 500	NTUU ² 'Ihor Sikorsky Kyiv Polytechnic Institute'
3	541 - 550	Karazin Kharkiv National University
4	810 - 1000	Lviv Polytechnic National University
5	651 - 700	National Technical University 'Kharkiv Polytechnic Institute'
X	Ukrainian ³	X QS World University Ranking ⁴

The most popular majors in the 2020/2021 academic year⁵



BEFORE THE WAR, UKRAINIAN EDUCATION MOVED TOWARD EUROPEAN STANDARDS

Nevertheless, the Ukrainian education system has a long history. During the XXth century, it was shaped and controlled by Russia. **Until 1991 the education system was extremely politicised and impacted by the long-lasting russification policy.**

Starting from 1991, Ukraine has been introducing reforms in the field of education to reflect changes in its economic, political and social policies. **Independence and globalisation** became the main guiding principles of these reforms.

Since 1992, Ukrainian authorities have been adopting rules regarding licensing, accreditation, and legal **establishment of private institutions of higher** education. In 2005, Ukraine joined the **Bologna Process to harmonise its local** higher education with the European one. In 2006, an **External Independent Evaluation (EIE)** was launched with the aim to give equal access to quality education, monitor compliance of secondary education with the **State Standard**, and analyse the reforming process.

Countries by education rating, as of 2021

Top-3 countries



Neighbouring countries

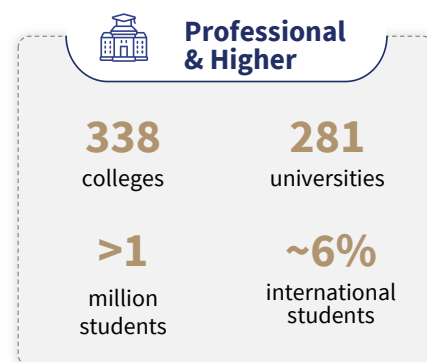
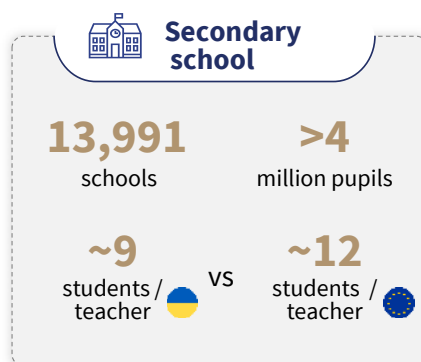
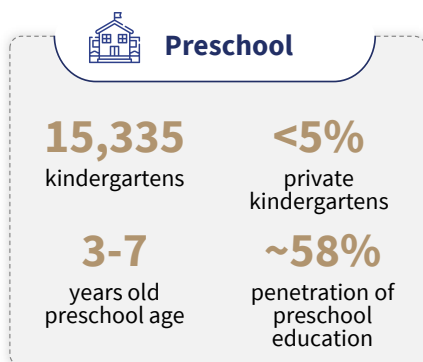


The number of **Ukrainian students abroad began to increase**, especially after the annexation of Crimea and the armed conflict in the east of Ukraine. The most popular destination for educational migration was primarily **Europe, namely Poland, Germany, and the Czech Republic**, as well as North America. In turn, the Ministry of Education and Science promotes Ukrainian education at the international level. As of 2021, there were **37.5 thousand registered invitations** for foreign applicants, with **medicine being the most popular major among international students.**



~80,000
Ukrainian students
studied abroad in 2020

Ukrainian education at a glance, as of the 2021/2022 educational year



In 2018, the Ukrainian government launched a **reform programme in education** called 'New Ukrainian School', which aimed to create a **new education environment** as a main priority. Reform implementation consisted of **three stages**, starting with the launch of the new **State Standard of Primary Education** in 2018, followed by the reform of **basic secondary education, scheduled for 2022**. The final stage of the reform that **dealt with profile secondary education** was projected to start in **2027**.

OPINION CORNER

Pavlo Timchenko

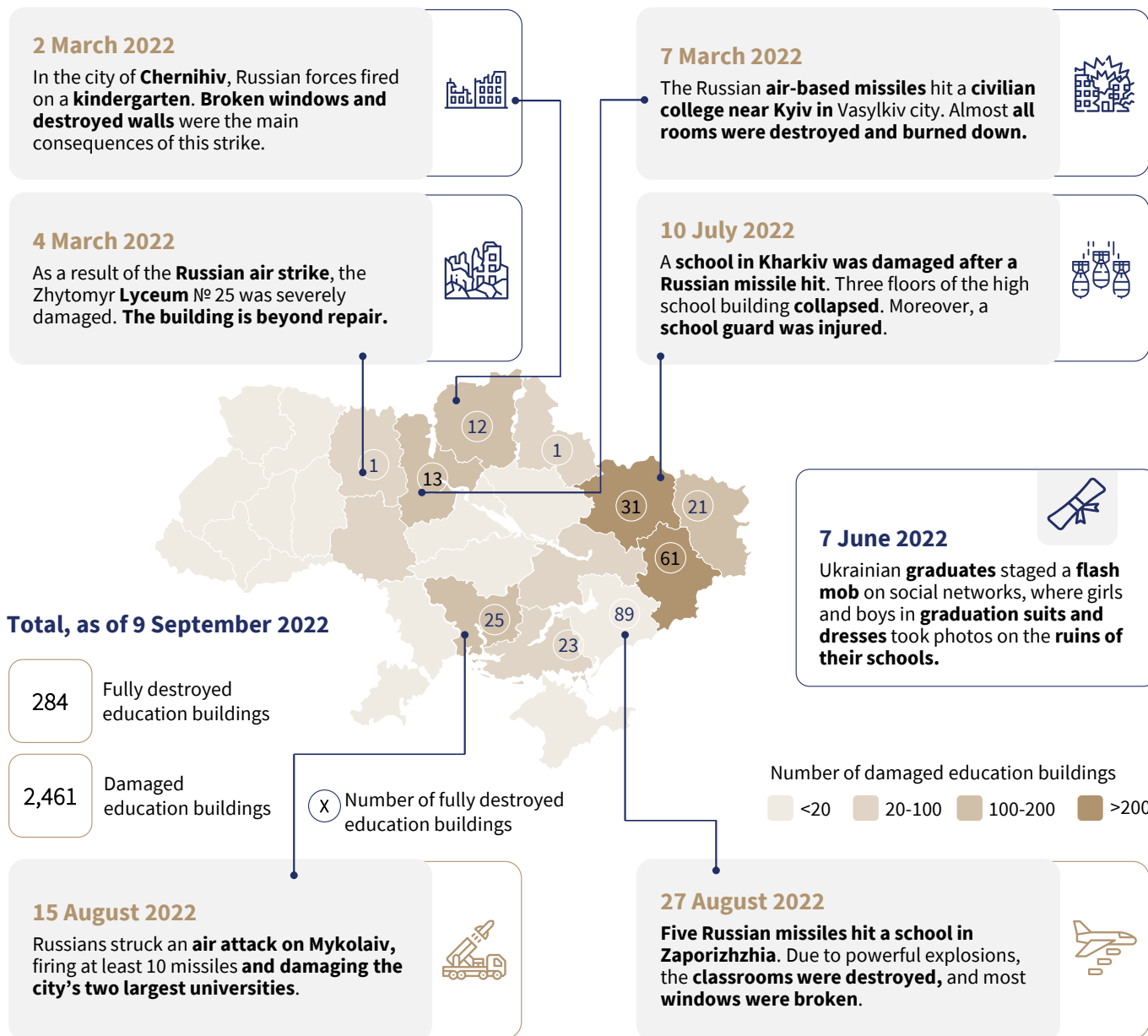
Talks about Educational Management, Digitalisation, Innovations, and Reforms



On 27 July 2022, the Ukrainian Parliament adopted the law, according to which the **Automated Information Complex of Educational Management** will become operational in Ukraine. The system will ensure **digital interaction with an appropriate level of personal data protection between state and local self-government authorities, educational institutions, and participants of the educational process**. This law will help speed up the **de-bureaucratisation of the educational process and the digital transformation of education in Ukraine**.

DESPITE MASSIVE CHALLENGES, ACADEMIC YEAR 2021 / 2022 IN UKRAINE WAS FULLY COMPLETED

Destroyed and damaged education institutions as a result of the Russian invasion



Ukrainian education at a glance

2021/2022 educational year



650,000 or **~16%** of all **Ukrainian pupils**¹ were forced to move abroad



69 professional and higher education institutions moved their operations to the safer regions of the country



Graduates received diplomas, EIE was changed for the **Multi-subject test**², and entrance campaigns were primarily adopted for online



Remote school education
Google, the Ministry of Ed&Sc³ of Ukraine, and UA TV channels created an **'All-UA online schedule'** for school students

2022/2023 educational year



~51% of schools are ready for **offline education**⁴
the 2022/2023 academic started with only half of the educational institutions, with shelters in place in case of bombings⁰

Educational format, thousand children

506

began the academic year in the EU schools

865

began the academic year offline

3,034

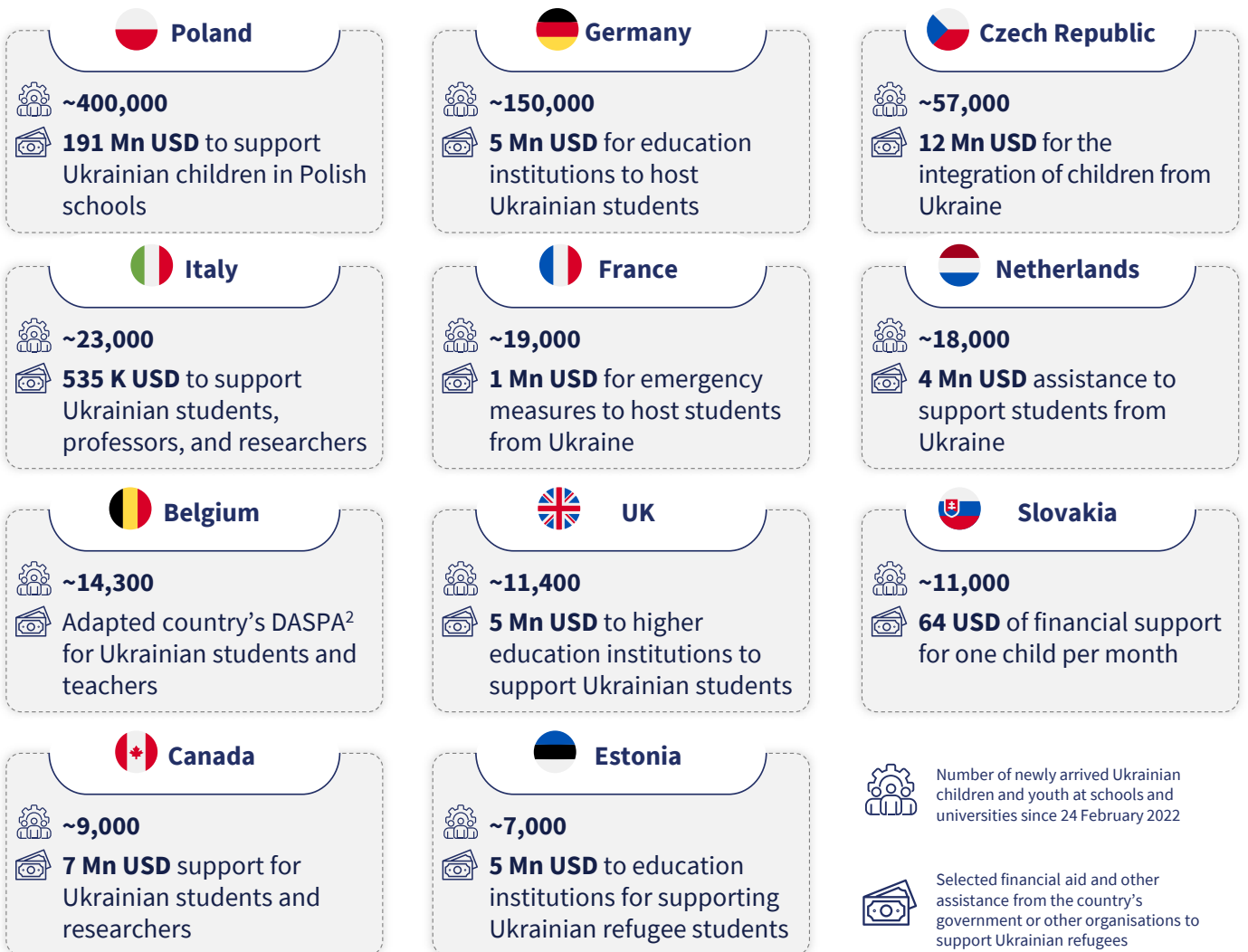
began the academic year online or in mixed format

UKRAINIAN REFUGEE STUDENTS ARE INTEGRATED INTO EDUCATION IN HOSTING COUNTRIES

As of August 2022, **over two million Ukrainian children** were forced to move abroad. Moreover, **almost 22 thousand Ukrainian teachers stayed abroad**. In response to this, the Ministries of Education in hosting countries have developed programmes to involve **students, pedagogical, and scientific-pedagogical specialists** from Ukraine who applied for education

or work. **In 2022, around 30% of Ukrainian students are expected to apply to European universities**, putting **higher pressure on the education systems** of the hosting countries, as they may not be ready for such a high number of new enrollees. If not managed properly, this could cause a **crisis in the European education sector**.

Selected countries' support of Ukrainian refugee students with education, as of September 2022¹



The hosting countries keep integrating **Ukrainians** into their education systems, demonstrating a high level of empathy for refugees and students. Naturally, Ukrainian children may have **some issues with the adaptation** caused by the new **environment**, including **language barriers** and **rules** that must be followed. Moreover, some countries have **compulsory education**, forcing parents to enrol their children on local school registration lists. This puts a double load on the children, as they must also continue their Ukrainian education.

International support for the Ukrainian education sector

UNESCO

UNESCO provides **computer equipment**, develops **digital education platforms and content**, as well as a system of **electronic assessment** for higher education



Canadian, German, Lithuanian, and British universities launched a **partnership with Kyiv-Mohyla Academy, providing their campuses** for Ukrainian students³

Google

43,000 laptops
In partnership with the Ministry of Ed&Sc⁴ of Ukraine, Google will provide **computer equipment and software for the education process**

Source: The Ministry of Education and Science of Ukraine website; Erasmus+ website; UNICEF website; SaveSchools website; Media overview
Notes: (1) Based on the latest available data; (2) Reception and schooling system for newcomers and assimilated students; (3) The list is going to be expanded with the US higher education institutions; (4) Education and Science



Economics and IT are the most promising educational streams



Economic specialties remain relevant today and will be in demand in the future. Professionals in economics are indispensable for shaping a balanced economic agenda of a country, as well as for developing reforms that will be required for the recovery of the Ukrainian economy.

At the same time, we see that in its further development higher education should focus on strengthening students' skills in information technology.

DR ANZHELA IGNATYUK

Dean of the Faculty of Economics, Taras Shevchenko National University of Kyiv

Involvement during Russia's war against Ukraine: Despite the full-scale invasion of Russia, Dr Anzhela Ignatyuk stayed in Ukraine. She takes an active social position and continues working, helping future entrants to get a profession, which will help rebuild our country in the future.

How will the universities of Ukraine transform their accreditation systems to bring them in line with the European standards?

In 2019, the accreditation system of educational programmes in Ukraine went through drastic changes. The new approach and the criteria for accreditation are now based on the European Standards and Guidelines for Quality Assurance in the European Higher Education Area and on the best European practices. The new accreditation procedure requires re-evaluation of the content and organisation of education, fairness and transparency of assessment, quality of teaching vs. the European standards. And all this becomes a driver for ensuring the quality of higher education, based on the principles of the European Association as one of the obligations of Ukraine within the framework of the Association Agreement with the EU. For the accreditation purposes, we may ask our European colleagues for independent evaluation of our educational programmes. Our joint degree English-language programmes with Macerata University (Italy) and Nord University (Norway) are the most likely candidates for this kind of accreditation.

How can the Faculty of Economics collaborate better with the Professional Services sector in order to rebuild Ukraine?

The university pursues a policy of collaboration with professional organisations. For quite a number of years, the Faculty collaborates with the Expert Council of Employers and Graduates of the Faculty of Economics. It is a consultative and advisory body that we cooperate with strategically, in order to ensure the high quality of the educational process, compliance with the latest trends in the labour market, as well as endowing our graduates with a relevant professional skillset. With the support of the Council of Employers, the Faculty of Economics organises various events such as forums, round tables, and conferences to discuss strategic economic issues. We also cooperate with professional organisations such as the Union of Small, Medium-sized and Privatised Enterprises of Ukraine, the Chamber of Commerce and Industry of Ukraine, the German-Ukrainian Chamber of Commerce, the CFA Institute, the Chartered Institute of Management Accountants (CIMA), the Association of Marketing Professionals of Ukraine, and the number of others.



I would rather see the education sector more flexible and connected to practice



I would not like educational institutions to impose a 'correct' worldview and intrude on university practices. We do not need any 'correct' ideologies and state programmes of some 'patriotic' education – this is archaic. The Ukrainian educational process should be aimed at raising an autonomous, free and responsible individual, able to resist all forms of authoritarianism and propaganda of undemocratic forms of social life.

DR ANDRII BAUMEISTER

Philosopher; Public Intellectual; Professor at Taras Shevchenko National University of Kyiv

Involvement during Russia's war against Ukraine: *With the beginning of the full-scale Russian invasion of Ukraine, Andrii has actively shared his thoughts on the war, touching on comprehensive topics, ranging from lives of ordinary people in the realities of constant fear and anxiety to the impact of the war on the future of entire Europe.*

How can we stop the outflow of the Ukrainian students to Europe?

The state, society, business, and the public sphere have to work together. It is important to create an environment where young people feel they are needed and important. It is clear that it is still difficult for the Ukrainian universities to compete with those in the USA and Europe. It is important to bridge the gap between a university and the labour market, between a university and social life, between a diploma and the possibility of creative self-realisation of young professionals.

How do you see the education sector after the Ukrainian victory?

After the victory, I would rather see the education sector more flexible, more connected to practice, and more integrated into the Western education and labour system. There should be less imitation, fewer bureaucratic requirements and more academic freedom and creativity.

How should the education respond to the challenges that the society has faced since the outbreak of the full-scale war?

I would not like educational institutions to impose a 'correct' worldview and intrude on university practices. We do not need any 'correct' ideologies and state programmes of patriotic education – this is archaic. The Ukrainian educational process should be aimed at raising an autonomous, free, and responsible individual, able to resist all forms of authoritarianism and propaganda of undemocratic forms of social life.

Has the mindset of students changed since the start of Russian full-scale invasion?

Without a doubt, the mindset of students has undergone transformation. Perhaps, having experienced the war, we should be more open, authentic, open-minded, ready for serious debate and respectful to one another. An individual's dignity, sovereignty and responsibility must be at the forefront.

UKRAINIAN HEALTHCARE IS BEING TRANSFORMED INTO A PATIENT-CENTRIC AND DIGITALISED SYSTEM

Nowadays, the healthcare system of Ukraine is based on the Beveridge model, which guarantees **free access to healthcare services for all Ukrainian citizens**. However, until 2018, there was a big **quality gap between state and private healthcare services** in the Ukrainian healthcare system. Since 2017, the Medical sector of Ukraine has been transforming

into a **patient-centric, effective, affordable, and anti-corrupted** healthcare model. In 2017, the **Programme of Medical Guarantees (PMG)** established a new financing model for the healthcare system, according to which the state now pays a unified tariff for a list of guaranteed medical services to doctors and medical facilities where patients receive care.

Ukrainian healthcare system at a glance

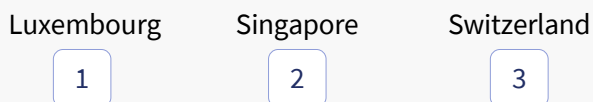
2017

2021

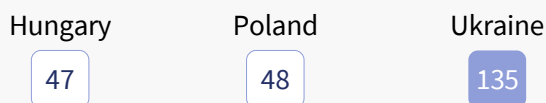
LPI¹ ranking, Health pillar

The **Health pillar** assesses the overall **health level of the population** and its access to healthcare services. Ranking includes **health outcomes, the effectiveness of the health systems, illness and risk factors, and mortality rates**.

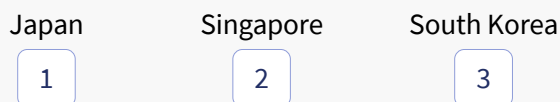
Top-3 countries



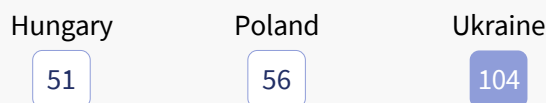
Neighbouring countries



Top-3 countries



Neighbouring countries



Until 2017, state medical institutions received funds directly from the state budget as a **subvention for personnel and infrastructure capacity**. Based on the registration address, people were connected to doctors, and at the same time, **doctors were working on fixed salary rates** that did not depend on the quality of their work.

Since 2018, budget funds have gone both to state hospitals and private practices. Costs for treatment are allocated to patients, not institutions, and people can conclude a **contract with a doctor** they choose **without any registration limits**. **Doctors are motivated** to provide quality service because their **income depends on the number of patients**.



91 USD
health expenditure per capita²



1,292
specialised care facilities



761 thousand
medical staff³



181 USD
health expenditure per capita²



1,135
specialised care facilities



654 thousand
medical positions³

2%

of total expenditures⁴

1%

of GDP

11%

of total expenditures⁴

3%

of GDP

Main changes in the Ukrainian healthcare system throughout 2017 - 2021

National Health Insurance Fund

National Health Service of Ukraine, the central **executive body**, was created and became responsible for the realisation of the PMG



E-Health

Medical institutions leveraged electronic healthcare systems to create a **central database of patients' clinical histories**



Money follows the patient

The financing of state medical institutions depends on the services actually provided and the NHSU's⁵ **unified tariffs**



Affordable Medicines Reimbursement

NHSU started the **free provision of prescription medicines** for patients suffering from **selected diseases**⁶



HEALTHCARE SYSTEM OF UKRAINE CONTINUES TO FUNCTION ON A FULL SCALE IN SPITE OF THE WAR

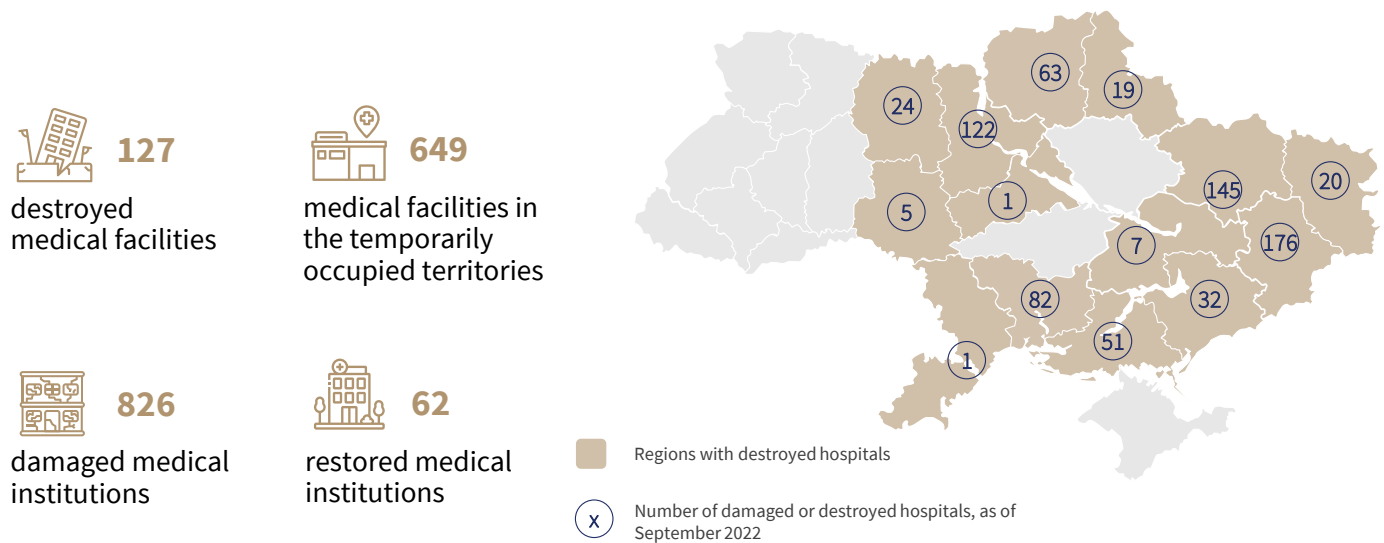
Since 24 February 2022, **almost a thousand medical institutions have been completely destroyed or damaged** due to the Russian invasion. So far, Ukraine has restored **only a small part of**

the damaged medical facilities with the support of international partners. Moreover, Ukraine **continues to transfer funds to the accounts of each medical institution in the occupation.**

The main challenges of Ukraine's healthcare system during the war

- **Shortages in medicines** to fulfil the demand caused by damaged warehouses and supply chain disruptions
- **Tuberculosis and HIV¹ programme disruptions**
- Diagnostic and treatment interruption of NCD²
- **Uneven patient loads of hospitals**
- Treatment and rehabilitation of **military people**
- **Mental health** worsening
- High level of **injuries and casualties** among civil people

Losses and the internal displacement of medical staff, as of August 2022



As of 26 August 2022, **over 3,800 internally displaced medical workers were employed** across Ukraine. The largest number of such medical workers were **officially employed in Dnipro (548), Kharkiv (363), and the Poltava (347) regions.**

To support the activity of medical institutions, **NHSU provided payments under a fixed tariff** without correlating the number of actually provided services. It also **simplified the prescription process** under the **Affordable Medicines Reimbursement programme.**

MOH³ cooperates with Medecins Sans Frontieres to organise **medical train referrals for wounded civilians** from territories with active military hostilities. It also opened a distribution warehouse for emergency medical supplies.

Military medical care

Military hospitals

Military medical care and treatment are provided by a **three-level military medical system** based on **territorial principles**, where the **first level is the hospitals with a maximum load:**

- **The Main Military Clinical Hospital** ensures highly specialised medical care, **and five Regional Military Medical Centers** are responsible for providing specialised medical care **to military people**
- **14 Military Hospitals** and **one Military Medical Clinical Center for Occupational Pathology** provide further qualified medical care

Combat medics

During 2017-2021, more than **600 combat medics were released from the Tactical Medicine Training Centre** under the **American 68W standard⁴**

- Since February 2022, **intensive training has been provided** to meet the demand for **emergency medical treatment specialists** in the full-scale war
- Combat medics provide crucial support distributed in combat units along the entire front line. They **treat the wounded and evacuate casualties from the battlefield**

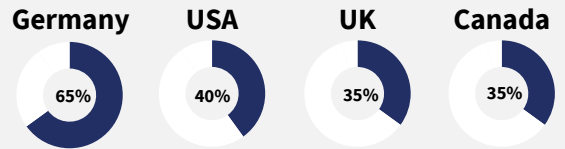
Source: Health Cluster Ukraine — Public Health Situation Analysis — [2022]; The Ministry of Health of Ukraine website; Media overview
 Notes: (1) Human immunodeficiency viruses; (2) Non-communicable diseases are non-transmissible diseases, usually chronic diseases of long duration and generally slow progression; (3) The Ministry of Health of Ukraine; (4) The Military Occupational Specialty for the United States Army's Combat Medic Specialist

HUGE INTERNATIONAL SUPPORT FOR UKRAINIAN HEALTHCARE IS BEING PROVIDED DURING THE WAR



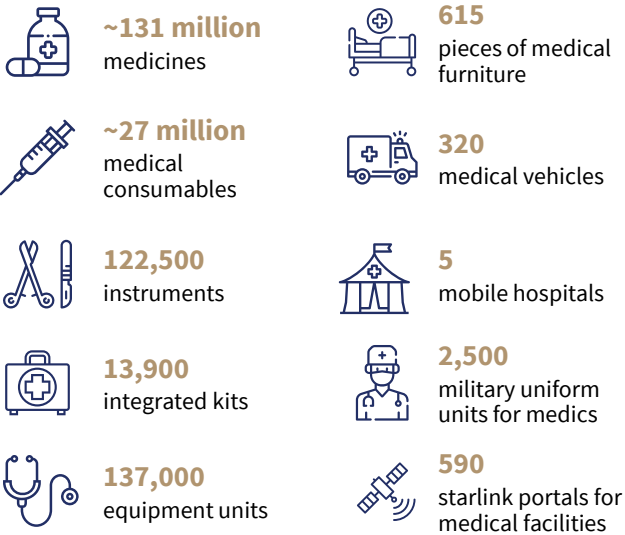
The President of Ukraine launched **UNITED24** as a central **donation platform** for collecting **aid for three main areas**, including medical aid. As of 9 September 2022, **10.2 Mn USD** was collected **for medical needs**.

Share of medical aid in total, UNITED 24 aid from selected countries as of 28 June 2022



The Ukrainian system received great **humanitarian support** to stabilise its position during the war. As of **August 2022**, **humanitarian help amounted to over 328 Mn USD** and was delivered from **foreign and Ukrainian businesses, charity organisations, and foreign medical institutions**.

Humanitarian support as of the 100th day of the war



Alongside donation support, **18 countries** provided **specialised medical care services** to Ukrainian patients via **medical evacuation programmes**. As of September 2022, selected medical evacuation programmes included such areas:

- **Evacuations of children with cancer disease via ‘Convoys of life’** to the Unicorn centre in Poland, with further transportation to the hosting countries. As of 7 September 2022, 500 children with cancer were evacuated via 15 medical convoys
- **Within the SAFER Ukraine programme**, children with oncological and haematological diseases were evacuated for treatment in the **USA, Canada, and 14 European countries**
- **Evacuation of civilians with specific diseases and severe injuries with the need for prosthetics**. As of 7 September 2022, in cooperation with MOH and the EU Commission, approximately 1,400 Ukrainian civilians were evacuated to other countries.

Healthcare support of the European Union



On 4 March 2022, the European Union agreed to activate the **Temporary Protection Directive** for displaced persons from Ukraine. It **defines the rights for temporary protection and grants residence permits, access to education, the labour market, as well as medical assistance**, with both **emergency care and essential treatment of illness**.



The 24 European Reference Networks (ERNs), which specialise in the **diagnosis and treatment of rare / very rare illnesses** with 1,600 expert centres in more than 300 EU hospitals, offered the **Rare Diseases Hub Ukraine**, an application that **connects patients in Ukraine who have a rare disease with organisations, hospitals, and members of the ERN**.

Poland

Provides Ukrainian refugees with **access to all medical services** in the country on the same basis as Polish citizens, using only a Ukrainian passport or identity document.

Germany

MedWatch organisation arranges **insulin** for people who need it and **drugs for people with cancer or multiple sclerosis**.

Source: The Ministry of Health of Ukraine website; UNITED24 website; World Health Organisation website; European Commission website; Media overview

OPINION CORNER

Alina Mykhailova-Zinchenko
Talks about Medicine, International Aid, Humanitarian Crisis



Humanitarian aid is extremely important for Ukraine. During the full-scale Russian invasion of Ukraine, according to the Ministry of Health, the invaders killed at least 18 medical workers and seriously injured 56, **damaged 884 medical facilities**, of which 123 were completely knocked down. With shelling, the occupiers **destroyed 87 ambulances, seized 241 cars, and also damaged about 450 pharmacies**.



Medical workers in Ukraine face increasing pressure



Unfortunately, the situation with medical care in the occupied territories is critical. A large number of medical institutions have been looted. There are problems with the logistics of medicines. Patients with chronic diseases are in need of medication, especially patients receiving hormone therapy, cancer patients, insulin-dependent patients and people with cardiovascular problems.

LIUDMYLA POLISHCHUK

Nurse at the Centre of primary medical and sanitary aid, Vinnytsia, Ukraine

Involvement during Russia's war against Ukraine: Medical workers work overtime. In connection with the war, the load on all medical institutions increased. In order to provide assistance to wounded soldiers, institutions like sanatoriums and medical dispensaries are even involved. Inpatient medical care has switched to irregular working hours.

What benefits have you gained from the implementation of the medical reform in your medical practice? What disadvantages have you noticed in the new system?

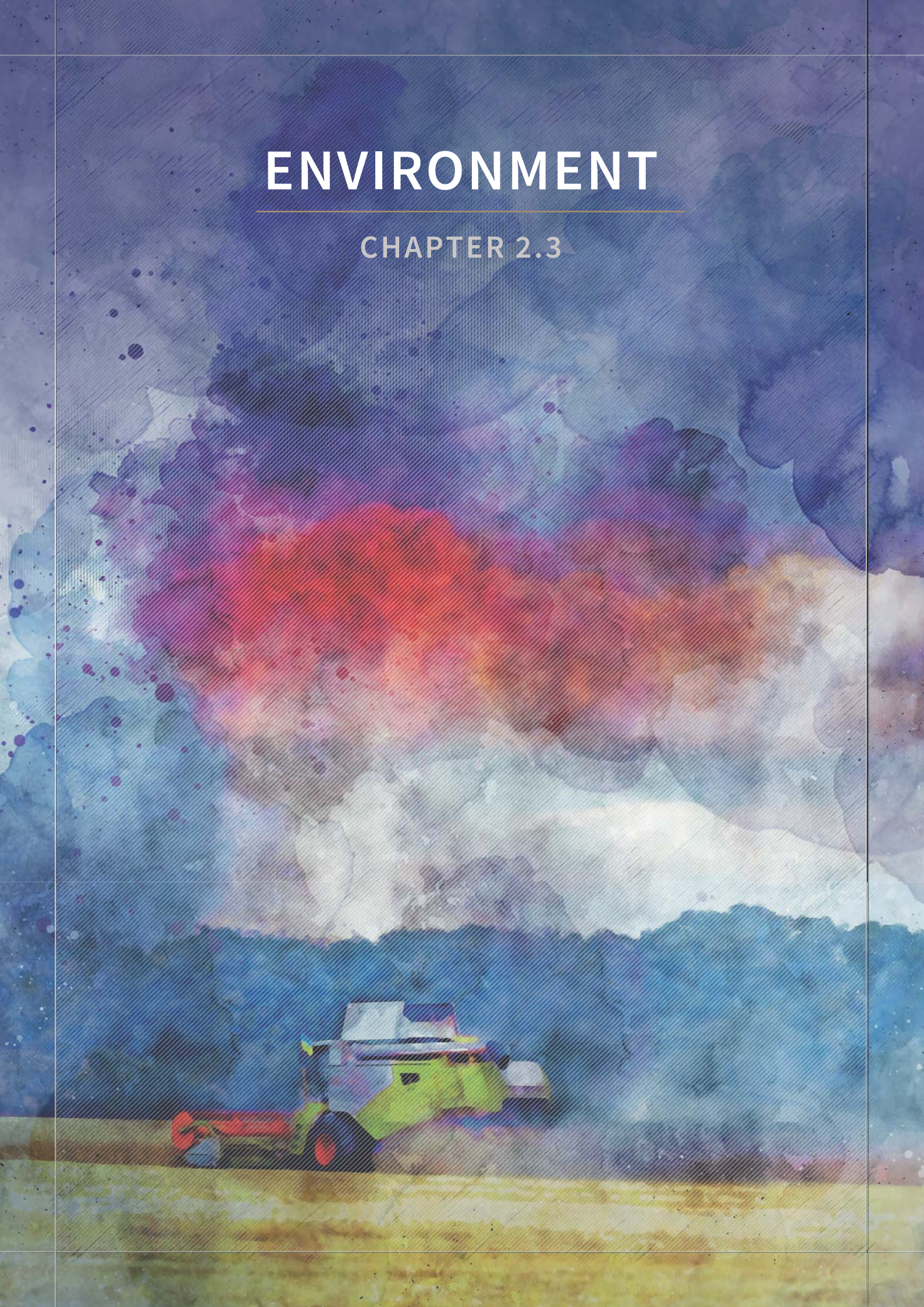
After the implementation of the medical reform, the e-system has become a priority. Namely, the introduction of an electronic patient record, which contains absolutely all data about the health status of a patient and treatment received throughout his or her life. The introduction of electronic prescriptions and an electronic medical opinion as to temporary inability to work is also an achievement. Unfortunately, there are occasional delays in the operation of the electronic system.

How has the war affected the work of medical institutions? Is there enough medical staff in hospitals? What help is most needed during the war for people having numerous chronic diseases?

During the war, medical facilities, especially hospitals, went into a special mode of operation. The number of requests from patients with chronic diseases, as well as those from internally displaced persons, has increased. One should also note regular medical assistance is provided to wounded combatants, brought back from the combat zone. Medics are under great pressure, but they are fulfilling their functions. Nowadays, a large number of people require medical, as well as psychological assistance.

ENVIRONMENT

CHAPTER 2.3



ENVIRONMENTAL CONSEQUENCES OF THE WAR ARE HUMAN CONSEQUENCES, BUT IN A DIFFERENT FORM

Beyond the horrible human tragedy, the Russian invasion of Ukraine has also caused a **shocking environmental disaster**. The catastrophic harm to the environment will continue to unfold for many years as Russia launched missile attacks on critical infrastructure and hazardous sites — nuclear facilities, chemical plants, ammonia pipelines, and petroleum refineries — leading to

the **widespread contamination** of air, water, and soil. Ukraine will need many years and considerable resources to at least return the environment to its pre-war state. For that reason, it is highly important to understand the scope of military **impact on the environment** in Ukraine, as the environmental consequences are also human consequences, just in another form.



Environment

The section discloses key aspects of the environmental sphere that have suffered the most from the Russian full-scale war in Ukraine, including:

- Environmental safety
- Biological diversity
- Nuclear security



Environmental safety

- Situation of environmental safety in Ukraine before the war
- Effects of the military actions on air, water, and soil
- Possible impact of environmental crimes in Ukraine on Europe



Biological diversity

- Biodiversity in Ukraine before the Russian aggression
- Influence of the Russian hostilities on the nature reserve fund
- Emerging risks to the biodiversity of Europe due to the war



Nuclear security

- Current state of the nuclear sector in Ukraine
- Impact of the Russian invasion of Ukraine on nuclear security
- Potential threat of Russian nuclear terrorism to the world

BEFORE THE WAR, UKRAINE FOCUSED ON THE IMPROVEMENT OF ITS ENVIRONMENTAL SAFETY

Before the Russian invasion of Ukraine in February 2022, **the country had been focusing on the transition to sustainable development to improve environmental protection.** Since Ukraine is a country with a heavily industrialised economy and large agricultural sector, it was dealing with long-standing negative environmental consequences, including industrial pollution, depletion of natural resources, degradation of natural ecosystems, low energy efficiency, poor waste management, etc. This led to increasing air pollution, land degradation, biodiversity loss, climate change, and human health issues associated with environmental risk factors.

The EU-Ukraine Association Agreement allowed the country to start the development of an environmental policy and the implementation of various measures in the field of climate change and environmental safety.



Key reasons for environmental problems in Ukraine:

- **Inherited structure of economy** with a prevailing share of resource- and energy-intensive industries
- **Depreciation of fixed assets** of the industrial and transport infrastructure
- **Absence of proper separation** of environmental protection and economic functions
- **Ineffective system management of state governance** in the area of environmental protection
- **Insufficient understanding in society** of priorities for the preservation of the environment

In 2021, **Ukraine was ranked 52nd in the Environmental Performance Index (EPI)**, a global ranking across 180 countries that provides a data-driven summary of the state of sustainability in terms of climate change performance, environmental health, and ecosystem vitality across 11 categories. However, **the performance of Ukraine across specific indicators, such as air quality, water and sanitation, and ecosystem health, was comparatively poor**, indicating the need for further improvement of the environmental situation.

Environmental performance in Ukraine before the war across selected categories, EPI 2022



Air Quality

7 indicators: ozone, PM, household solid fuels, SO₂, NO_x, CO, and volatile organics¹



Water & Sanitation

2 indicators: unsafe sanitation and unsafe drinking water



Ecosystem Health

3 indicators: grassland loss, wetland loss, and tree cover loss

Leaders

1	2	3
Iceland	Sweden	Finland

Neighbouring countries

74	80	88
Poland	Hungary	Ukraine

Laggers

178	179	180
Nepal	India	Pakistan

Leaders

1	1	1
Iceland	Norway	Finland

Neighbouring countries

34	62	66
Poland	Romania	Ukraine

Laggers

177	178	179
Nigeria	Niger	Chad

Leaders

1	2	3
Bahrain	Malta	UAE

Neighbouring countries

57	103	134
Moldova	Ukraine	Poland

Laggers

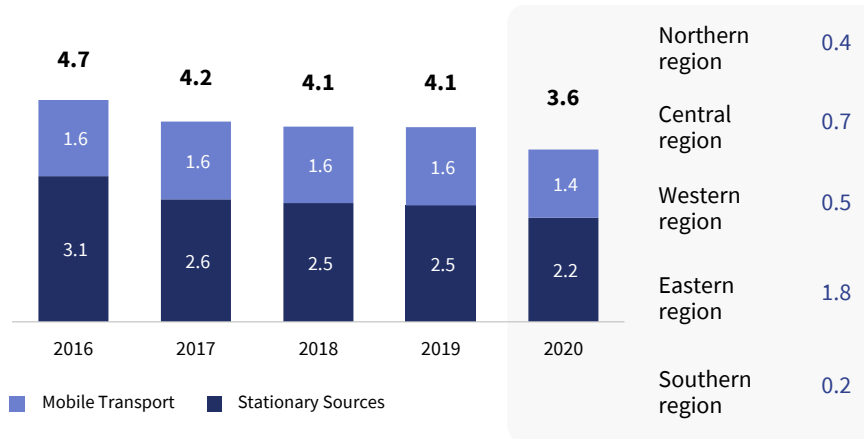
174	175	176
Malaysia	Liberia	Qatar

Source: Yale University — The 2022 Environmental Performance Index (EPI) — [2021]; The Ministry of Environmental Protection and Natural Resources of Ukraine website; CEE Bankwatch Network website
 Notes: (1) Ozone exposure, particulate matter 2.5 exposure, household solid fuels, sulfur dioxide exposure, nitrogen oxides exposure, carbon monoxide exposure, and volatile organic compound exposure

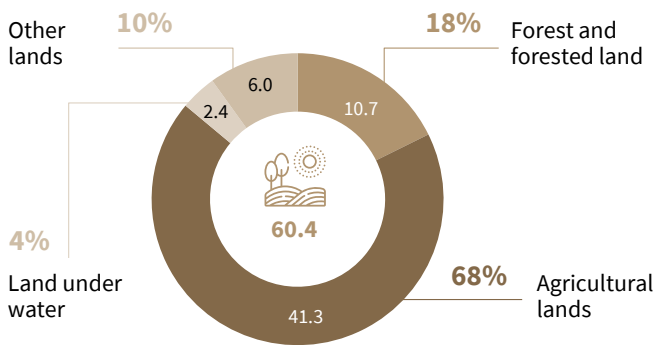
KEY ISSUES: AIR POLLUTION, LAND DEGRADATION, AND LACK OF WATER PROTECTION

Due to the high carbon intensity of the economy, with **various resource- and energy-intensive industries**, air pollution has been **one of the main environmental issues in Ukraine**. Despite the decrease in emissions during 2016-2020 by 23%, the level of air pollution in industrial regions and large cities remained high in 2020, with particularly heavy pollution in the eastern part of the country. In 2020, **stationary sources of air pollution accounted for around 60% of emissions**, which were mainly produced by the mining and processing industries and energy generation.

Air pollutant emissions by source in Ukraine, million tonnes / year



Land use in Ukraine in 2020, million ha

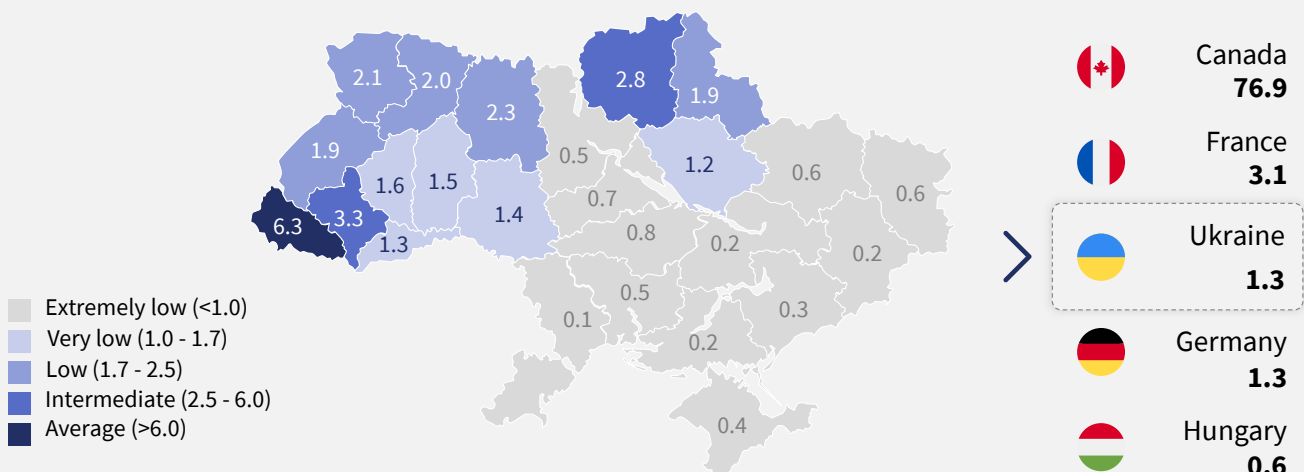


The large agriculture sector in Ukraine has also been causing various environmental problems related to the **inefficient use of land resources and aggressive agricultural practices**. In 2020, agricultural land in Ukraine amounted to 68% of the total area, most of which was fertile and arable land.

Excessive ploughing of land, violation of the balanced ratio between land categories, reduction of the territory of unique steppe plots, and disruption of the natural process of soil formation on a national scale have led to **the processes of land degradation throughout the country**, including **erosion, soil compaction, and the loss of humus**.

Additionally, discharges from industrial enterprises, improper condition of the drainage infrastructure and treatment facilities, non-compliance with the standards of water protection zones, and the flushing of toxic substances have significantly **reduced the quality of groundwater in Ukraine and caused the scarcity of water**. Ukraine is **one of the least water-rich countries** in Europe. In 2020, **renewable freshwater per capita in Ukraine amounted to 1.3 thousand m³**, which is considered to be an insufficient level.

Renewable freshwater resources per capita in thousand m³ per year, 2020



THE WAR HAS EXACERBATED THE POLLUTION OF AIR, LAND, AND WATER IN THE COUNTRY

Russia's war against Ukraine has had an **enormous impact** on both different, separate natural components (air, water, and land) and ecosystems as a whole. The Ukrainian environment has already suffered about **11 Bn USD of losses** since the beginning of the war, while the considerable volume of damage is still difficult

to assess because of the ongoing hostilities. Numerous missile strikes, bombardments, shelling, and other crimes committed by Russia **caused ecological catastrophes across almost all the regions of Ukraine**. The restoration of ecosystems will require a significant amount of funds and resources.

Major factors causing the pollution of air, land, and water during the war in Ukraine

					
Explosions of missiles, bombs, and shells that cause the pollution of air, land, and water with toxic substances	Destruction of treatment and sewage facilities, causing pollution of the environment with waste	Pollution of water and soil by cadaveric venom due to the mass death of people and animals	Leakage and combustion of petroleum products and chemicals as a result of shelling of industrial sites	Pollution as a result of the destruction of facilities that provide the pumping of water from decommissioned coal mines	Numerous fires in forests, residential buildings, markets, warehouses, etc., caused by hostilities



Environmental consequences of the Russian invasion of Ukraine^{1,2}



515 cases

total number of eco-crimes committed by the Russian army, which caused environmental pollution



10.7 Bn USD

estimated losses to the environment of Ukraine as a result of hostilities across the country



45 times

increase in the area of forest fires in Ukraine caused by the war compared to 2021



4.6 million people

number of citizens without proper access to drinking water across Ukraine



294,242 tonnes

amount of emissions caused by the shelling of oil storage facilities in Ukraine



30 million ha

total area of the territory of Ukraine that should be demined from bombs, shells, mines, etc.

OPINION CORNER

Maryna Tropina

Talks about Environmental challenges, Pollution, and Ecological security

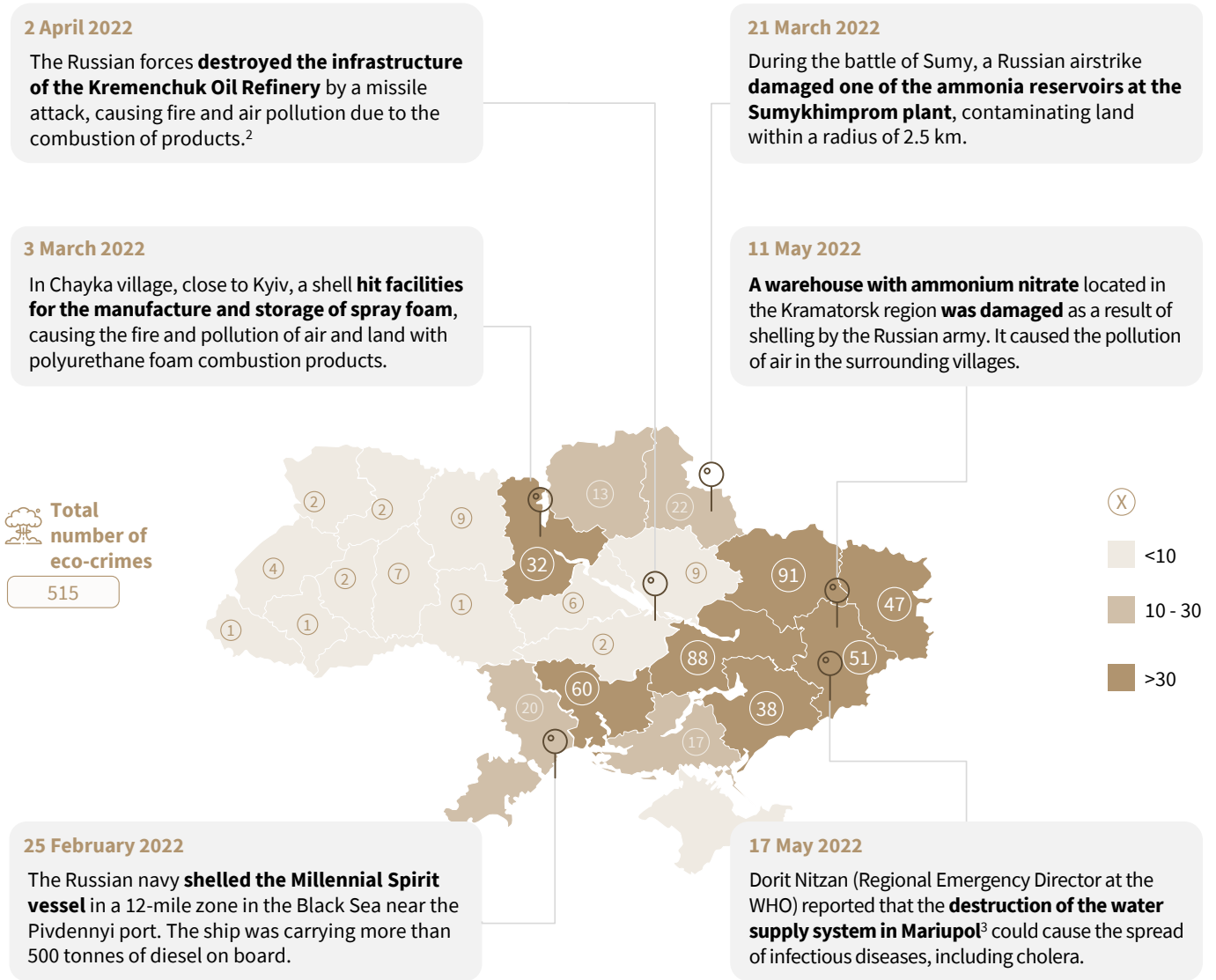


With Russia's invasion of Ukraine, the problem of **ecological security became especially critical**, as the spectrum of destruction is quite wide: incidents at nuclear power plants, oil refineries, gas facilities, and agricultural processing enterprises. Thousands of cases of **air, water, and land pollution with explosive toxic substances** and degradation of ecosystems have already been recorded, which is **a threat not only to Ukraine, but also to neighbouring countries**.

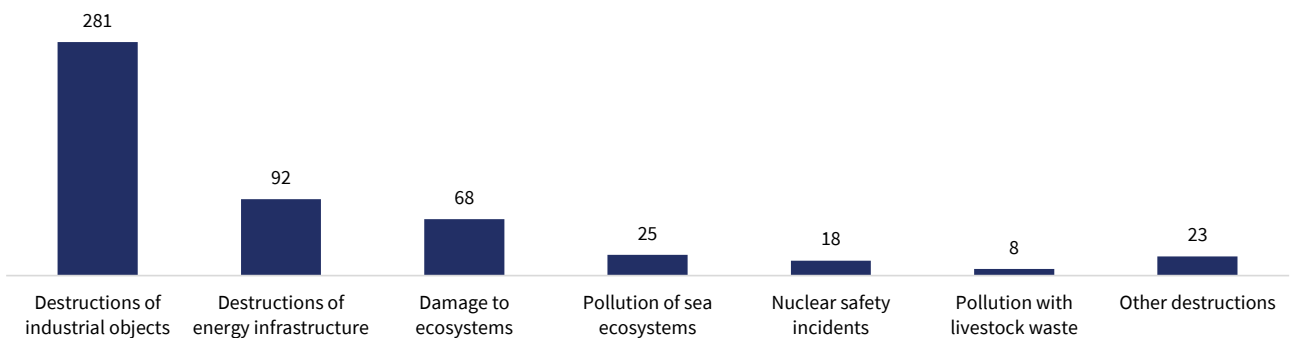
Source: The Ministry of Environmental Protection and Natural Resources of Ukraine website; Media overview
Notes: (1) For the period of 24 February 2022 – 11 September 2022, latest available data; (2) Selected based on the publicly available data

SINCE THE START OF THE WAR, THERE HAVE BEEN A NUMBER OF ECO-CRIMES CAUSING HIGH POLLUTION

Selected eco-crimes committed by Russia, causing the pollution of air, water, and land¹



Eco-crimes committed by the Russian military forces by category¹



THE WAR IN UKRAINE IS NEGATIVELY INFLUENCING THE ENVIRONMENT IN THE WHOLE OF EUROPE

Environmental impact of the war in Ukraine on the European continent¹

Ukraine is the largest European country located in the Eastern part of the continent, covering more than 603.7 thousand km². The hostilities are taking action across almost the whole territory of Ukraine, so the environmental consequences of the war are **also indirectly impacting and spreading across all layers of the geosphere in neighbouring countries.**



Emissions from hostilities are polluting the air not only in the territory of Ukraine but also in neighbouring countries, as the **winds spread the polluted air** throughout the whole European continent.

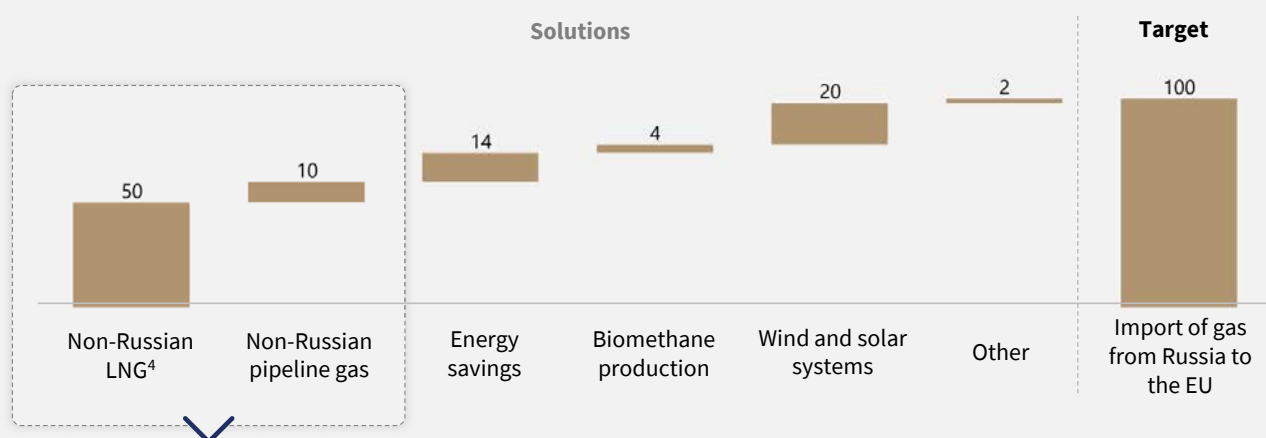


Due to the war in Ukraine, the pollution of water and sea ecosystems with **radiation, chemicals, or toxic waste** is also having a transboundary impact on the ecosystems of some European countries.



Neighbouring countries, such as Poland, Slovakia, Hungary or Romania, may be affected by the **pollution of soil and the deterioration of land fertility** due to the contaminated acid rainfalls spreading from Ukraine.

Key elements of the RePowerEU plan to reduce the dependence of EU countries on Russian gas in 2022, bcm^{2,3}

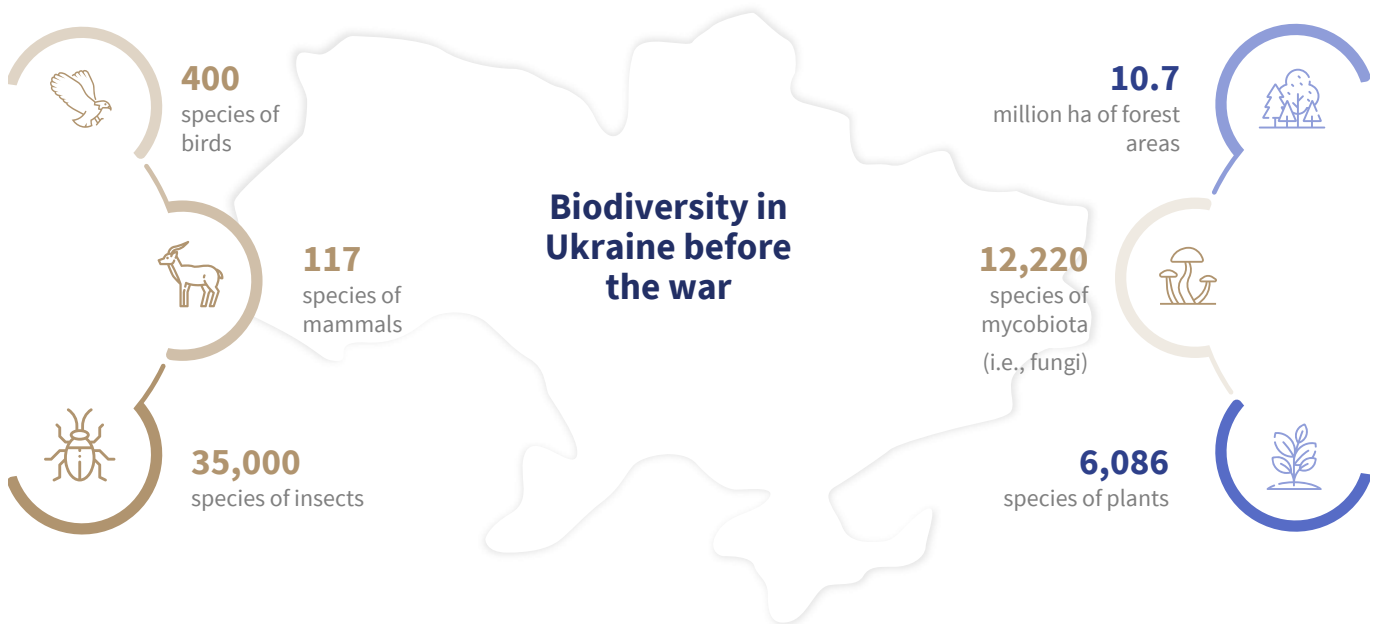


Despite the continuing efforts of European countries to boost the transition to clean energy sources, **the plans to reduce the dependence of EU countries on Russian oil and gas could still push emissions higher in the short-term period.** In the search for alternative energy sources within the coming years, these countries are still focusing on the import of LNG⁴ and are also slowing down the phase-out of coal.

UKRAINE HAS RICH FLORA AND FAUNA DUE TO FAVOURABLE CLIMATE CONDITIONS

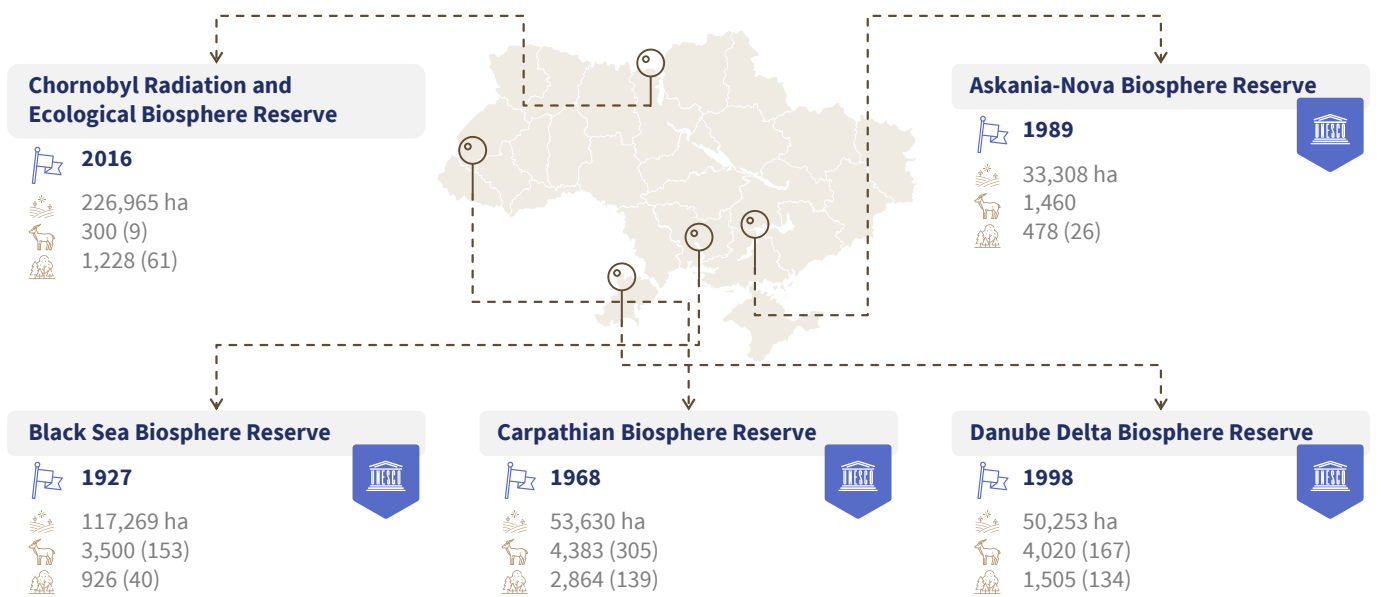
Ukraine has significant natural biodiversity potential, which plays an important role in the development of many ecosystem services and the use of land and resources. The variety of landforms and the existence of many migratory paths and nature zones in the country define the richness of its flora and fauna. **Nowadays, there are more than 44 thousand animal species and around 18 thousand species of plants and fungi** identified in Ukraine, with many of them being rare and endemic species.

Ukraine continues to develop regulations and measures aimed at improving the condition of biodiversity. In 2021, **Ukraine was ranked 76th out of 180 countries for the Biodiversity & Habitat category** in the 2022 Environmental Performance Index (EPI), which evaluates the actions of countries in preserving natural ecosystems and protecting biodiversity. Ukraine lagged behind 19 countries within Eastern Europe, but it was one of the leaders among 12 former Soviet Union states in the ranking.



Biosphere Reserves of Ukraine

In 2021, the Ukrainian nature reserve fund comprised 8,633 territories and sites. These territories account for 6.8% of the country's total area. The fund includes 53 national parks, 19 natural reserves, and 5 Biosphere Reserves approved by Presidential decrees. Biosphere Reserves are protected areas of international importance, meant for the conservation of plants and animals.



Area
 Species of plants (including rare species)
 Present Environment
 Species of animals: mammals, amphibians, birds, invertebrates, and fish (including rare species)
 Listed in the World Network of Biosphere Reserves (WNBR) by UNESCO

THE WAR AFFECTED AROUND A THIRD OF ALL BIODIVERSITY CONSERVATION AREAS IN UKRAINE

Russia's war against Ukraine has a wide range of harmful impacts on biodiversity and the natural habitat. The war has been particularly damaging to the country's protected areas, such as national parks and natural reserves, which have always been the mainstay of biodiversity conservation in Ukraine.

Major threats to biodiversity in Ukraine during the Russia's war against Ukraine

- **Warfare.** Shelling, shooting, and numerous explosions have a direct impact on the environment, damaging or killing wild animals and destroying plant species.
- **Habitat destruction.** Forest fires, movements of large-scale military vehicles, poaching, and encroachment on natural reserves harm habitats and destroy large areas of vegetation.
- **Environmental damage.** The remnants of war, such as land mines, cluster munitions, and large volumes of military scrap, contain metals and toxic materials that contaminate soil and water sources, leading to illness or death of animals.
- **Noise pollution.** The impact of powerful explosions, vibrations, sound navigation and location systems disturb the quiet existence of wild animals by disorienting them.

The impact of the war on biodiversity^{1,2}



~20%

of all protected areas in Ukraine are influenced by war activities



2.9 million ha

of forests were damaged by fire as a result of the Russian invasion



812 objects

of the nature protection fund are under threat in the war zone



0.9 million ha

of the protected areas are negatively affected by military hostilities



66,000 people³

displaced to protected areas, where they can disturb natural habitats



~5,000 dolphins

have died in the Black Sea or washed up on the shores since the beginning of the war



Selected war events impacting biodiversity

12 April 2022

In the south of the Donetsk region, the reported presence of the Russian military in the Meotida National Nature Park led to the **destruction of the birds' nesting places**, with some rare species missing the breeding season and not having offspring.

20 April 2022

The Marine Guard of the State Border Guard Service of Ukraine **declared a mine danger at the Danube Delta**, famous for one of the greatest wetlands on Earth, hosting over 300 species of birds and 45 freshwater fish species.

12 May 2022

Mass deaths of dolphins were recorded off the coast of the Odesa region. Dolphins fell into the zone of powerful radiation from the navigation devices of Russian warships, which led to their disorientation, and mammals were thrown ashore.

11 August 2022

As a result of hostilities, **a pine forest caught fire** in the Novokakhovske forestry and the Oleshkivske forestry of the Kherson region. **100 hectares of pine forest caught fire** near the village of Kardashynka due to shelling by the Russian army.

25 August 2022

The Shalygin territorial community in the Sumy region was shelled by Russian multiple rocket launching systems with phosphorous projectiles, 20 explosions were recorded. After surveying the area, a **forest fire was discovered in the area of the nature reserve**, as well as the remains of projectiles.

THE EUROPEAN ECOSYSTEM SAFETY IS AT RISK, AS UKRAINE HOLDS 35% OF EUROPE'S BIODIVERSITY

Ukraine is deeply integrated into global natural processes (such as migratory bird routes) and nature protection activities (for example, rare species conservation). The country is also part of the Green Heart of Europe, a region with places that are particularly rich in biodiversity, stretching from the Danube River Basin to the Carpathian Mountains.

Natural habitats in Ukraine are home to a third of the biodiversity in Europe, with more than 70,000 plant and animal species. The rare or endemic species comprise the world's most endangered group of species, which includes European bison, brown bears, lynx, and sturgeons. **The Russian invasion of Ukraine threatens the biodiversity of Europe.**

Internationally important wildlife sites and migratory bird routes are at risk



400 species of birds depend on the crossroads of the migratory routes that pass through Ukraine

Every spring, hundreds of thousands of waterfowl migrate along the southern sea coast and the northern forests of Ukraine. Various species arrive at these sites for nesting, including 30,000 pairs of white storks and 500 pairs of rare black storks. This year, **war activities threatened the breeding season.**



200 sites covering several million ha of the Emerald Network have been in danger since the war began

The Emerald Network is a network of protected areas created to preserve species and habitats at the European level.¹ Currently, the Emerald Network in Ukraine covers around 12% of the country's territory. Since the invasion, the **Emerald Network area of 2.9 million ha has been under the threat of destruction.**



14 territories of internationally important wetlands were affected by war activities

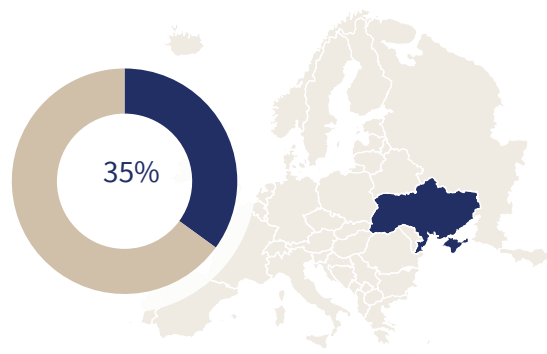
Ukraine has 50 sites classified as Wetlands of International Importance, which are called 'Ramsar Sites', with a total area of 930,559 ha. Since the war started, **48% of the total area of the coasts of the Azov & Black Seas** and the lower reaches of the Danube and Dnipro rivers **has been damaged.**



4 Biosphere Reserves have either been occupied by the Russian army or severely impacted by military actions

Since the Russian invasion, **more than 20 nature reserves and national parks, including 4 biosphere servers,** have been affected by hostilities. The long-term impact on biodiversity in Europe will be significant, as many of these protected areas have natural importance for Europe as a whole.

The share of Ukraine in the biodiversity of Europe



OPINION CORNER

Nataliia Gerasymchuk

Talks about Environment, Biodiversity, Ecology, and Legal Accountability

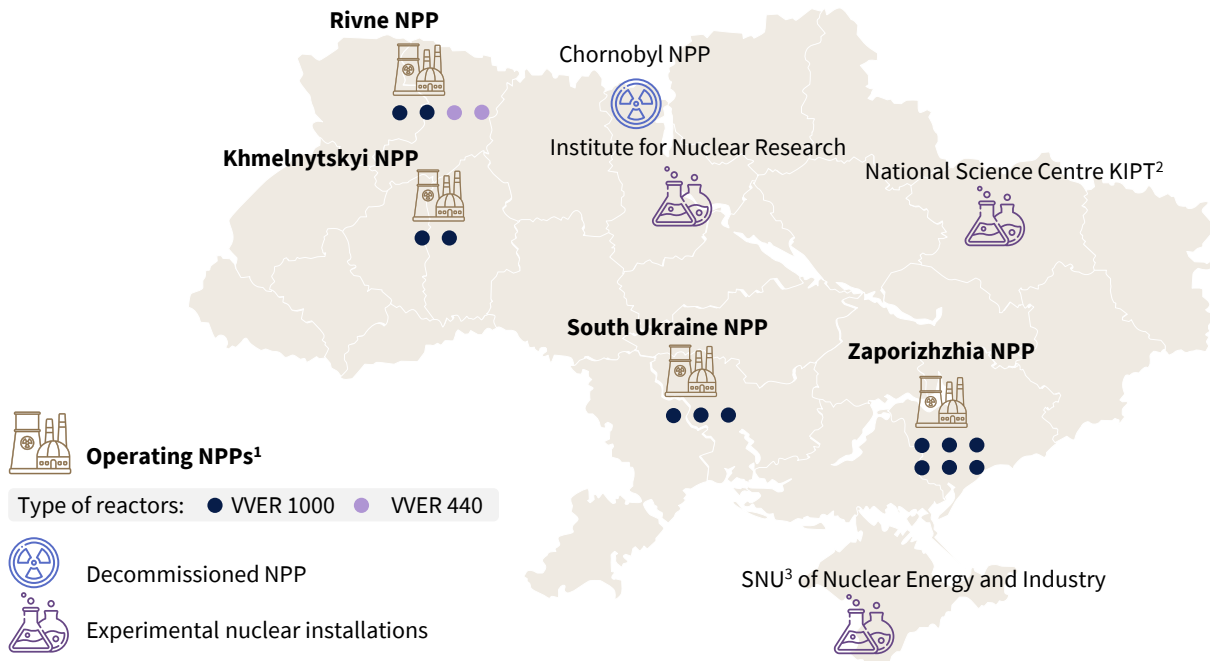


The international community should **increase responsibility for ecological crimes.** Since the late 1990s, there have been a few efforts to **include ecocide as one of the major crimes in the Rome Statute of the International Criminal Court.** What we witness now in Ukraine is **'the purposeful, negligent destruction of the natural environment through human activity.'** Unfortunately, there is little chance that Russia will be held accountable for its crimes against nature. For now, ecocide laws are vaguely written and difficult to enforce.

Source: Ramsar website; WWF website; BBC website; Emerging Europe website; Sustainable Development of Forestry in Ukraine website; WOWNature website; European Environment Agency website
Notes: (1) The Emerald Network is formed in non-EU countries and is part of the 'Natura 2000' network operating in the EU

NUCLEAR POWER HAS REMAINED A CRUCIAL ELEMENT IN THE ENERGY SECTOR OF UKRAINE

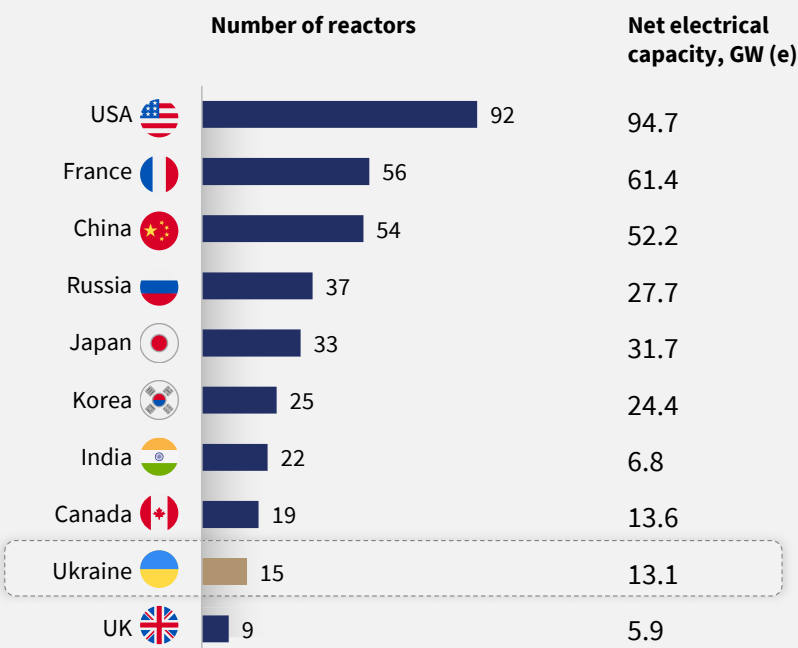
Nuclear installations in Ukraine, 2021



The energy sector of Ukraine is heavily dependent on nuclear energy, with 15 reactors being located at 4 nuclear power plants and generating more than half of the total electricity in the country. According to the Energy Strategy of Ukraine 2035, nuclear power is regarded as one of the most cost-effective low-carbon

energy sources, and its generation volume in the total electricity supply is expected to increase. Apart from NPPs, there are also other nuclear objects in Ukraine, such as radioactive waste storage sites, experimental nuclear centres, facilities for the extraction and processing of uranium ore, etc.

Top-10 countries by the number of reactors in operation, 2021⁴



Ukraine is one of the world's leading nuclear countries by the number of reactors and net electrical capacity. In order to ensure the robust and safe operations of all these nuclear installations, the country developed a comprehensive security monitoring system.

The Chornobyl accident (1986) became a milestone in the field of nuclear security, both in Ukraine and globally. The disaster caused a slowdown in the expansion of the nuclear sector in Ukraine. However, it also led to significant improvements in the level of nuclear security across all the NPPs in the country.

Source: International Atomic Energy Agency website; World Nuclear Association website; UATOM website; Media overview
 Notes: (1) Nuclear power plant; (2) Kharkiv Institute of Physics and Technology; (3) Sevastopol National University; (4) Latest available data; (5) Energoatom is a Ukrainian state enterprise that operates all four nuclear power stations in Ukraine

THE WAR HAS PUT THE SECURITY OF NUCLEAR FACILITIES ACROSS THE COUNTRY UNDER THREAT

Nuclear safety incidents caused by the Russian invasion of Ukraine¹



Since the beginning of the Russian invasion of Ukraine, **18 incidents of nuclear terrorism** committed by the Russian military forces have been reported at different nuclear objects in Ukraine. They include both direct damages to the nuclear infrastructure and dangerous incidents that could have potentially caused the destruction of nuclear objects.

However, taking into account the specific characteristics of the nuclear sector, even a **small incident at nuclear facilities might lead to large-scale environmental disasters**.

Selected cases of nuclear terrorism committed by the Russian military forces¹

Hostilities in the Chernobyl Exclusion Zone

In March 2022, Russian troops **damaged a number of infrastructure objects** at the Chernobyl NPP, which could have caused a nuclear catastrophe. The hostilities also led to large-scale forest fires and the spread of radioactive dust within the Exclusion Zone.

Capture of the Zaporizhzhia NPP

Since March 2022, the NPP has been temporarily under the control of Russian forces, who **interfere in the work of staff, place military equipment in the territory of the plant, and shell the infrastructure of the plant**. The shelling of the NPP's infrastructure has led to the disconnection of the final operating reactor from the grid on 11 September 2022.²

Low altitude of missile flights above NPPs

In April - June 2022, Ukraine recorded **four cases of Russian missiles flying over the sites** of the South Ukraine NPP, Khmelnytskyi NPP, and Zaporizhzhia NPP, posing a threat to the environment and communities not only in Ukraine but also globally.

Shelling of other nuclear facilities

In March 2022, there were **three cases of shelling** of the National science centre of KIPT³, where the experimental nuclear reactor is located. It did not cause an increase in radiation levels, yet the facility was significantly damaged. The risk of radioactive contamination is still high.

The consequences of Russian nuclear terrorism on the environment in Ukraine¹



7.6 times

increase in the radiation level in the Chernobyl Exclusion Zone during 24 - 25 February 2022 as a result of the Russian invasion



84.6 Mn USD

estimated losses to the environment caused by the Russian occupation of the Chernobyl Exclusion Zone



13,989 ha

total area of forest fires across the Chernobyl Exclusion Zone during the period of the Russian occupation



133 sources

number of ionising radiation sources (with the total radioactivity of 7 million becquerels) stolen by the Russian invaders from the Exclusion Zone

DID YOU KNOW THAT THE LARGEST NUCLEAR POWER PLANT IN EUROPE IS LOCATED IN UKRAINE?

6 nuclear power units
1 million kW each

1st The largest nuclear power plant in Europe

6th largest in the world



Zaporizhzhia Nuclear Power Plant

Enerhodar



On 4 March 2022, the nuclear power station was captured by Russian forces during the Russian invasion of Ukraine and began to be used as a military base.

RUSSIAN NUCLEAR TERRORISM POSES SEVERE RISKS TO THE GLOBAL ENVIRONMENT AND SAFETY

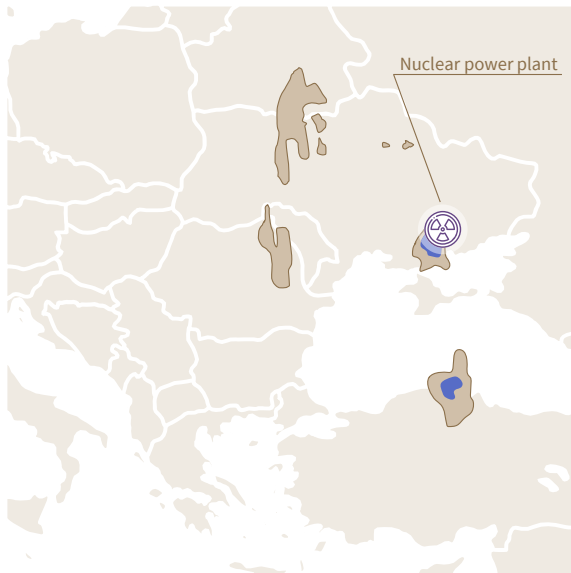
Due to the nuclear aspects of the war, provoked by Russia’s direct attacks and occupation of the nuclear facilities in Ukraine, there is an **existential threat of an ecological catastrophe in Europe and the whole world**. The professionalism and heroism of Ukrainian nuclear engineers, soldiers, firefighters, and other

people defending the nuclear facilities have been preventing the massive environmental disaster for about four months since the beginning of the invasion. However, as the war still continues and the nuclear danger remains high, ecological risks should not be underestimated.

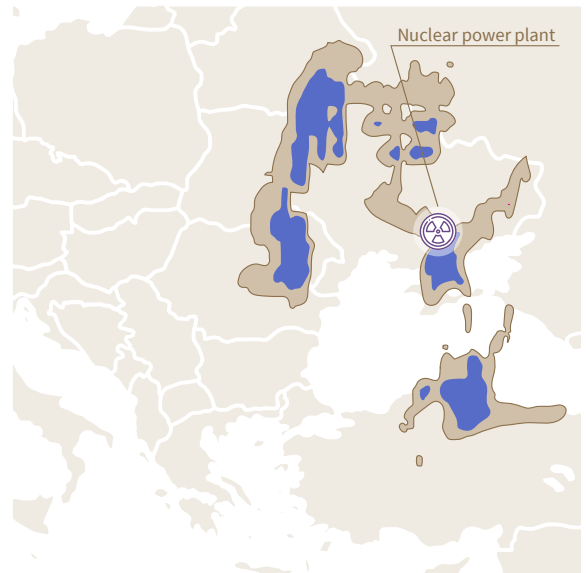
Estimated pollution in case of hypothetical nuclear accidents at the Zaporizhzhia NPP¹⁻³

The hypothetical impact of the possible nuclear accidents caused by the Russian invasion of Ukraine on the environment of the Eurasian continent **depends significantly on the type of the damaged nuclear objects, the scale and characteristics of destruction, location, weather conditions, etc.** However, the simulations made by atomic scientists indicate that possible accidents at the Zaporizhzhia NPP, which is currently controlled by the Russian forces⁴, **may cause massive pollution of the environment not only in Ukraine but also in other countries of Europe and the Middle East.**

Polluted area from hypothetical core meltdown



Polluted area from hypothetical spent fuel pool fire



Estimated pollution



Epicentre

■ 1.5 MBq/m² (Mandatory evacuation area)

■ 0.5 MBq/m² (Voluntary evacuation area)

Estimation of the relocated population in case of hypothetical nuclear accidents at the Zaporizhzhia NPP

Country	Compulsory	Voluntary
Ukraine	34,000 – 3.6 million	960,000 – 6.7 million
Türkiye	69,000 – 2.2 million	1.7 – 3.2 million
Romania	0 – 2.1 million	1.1 – 1.5 million
Moldova	0 – 420,000	260,000 – 450,000
Belarus	0 – 880,000	320,000 – 1.9 million

According to the scientific simulations, a hypothetical core meltdown and / or a fire in the spent fuel storage area at the Zaporizhzhia NPP due to hostilities **could cause the relocation of approximately 9 - 14 million people in five countries**, depending on the type of accident and the weather conditions.¹

The world should not turn a blind eye to the crimes of Russia



The work of international experts should contribute to the de-occupation and demilitarisation of Zaporizhzhia NPP, adjacent territories and the satellite town of Enerhodar. All things that happened and are happening at Zaporizhzhia NPP must be called by their proper names. The world should not turn a blind eye to the crimes of Russia.

OLEH KORIKOV

Head of the State Atomic Energy Regulatory Commission

Involvement during Russia's war against Ukraine: Oleh Korikov actively tries to inform European experts, especially those of IAEA mission, about the situation at nuclear energy enterprises, in particular, those that were forced to work under occupation conditions, calling attention to the fact that Russia ignores all international obligations to comply with nuclear safety standards by committing acts of nuclear terrorism. Oleh Korikov is sure that the Zaporizhzhia NPP should be de-occupied and return to the control of the Ukrainian authorities.

What potential consequences can nuclear incidents at one NPP or other nuclear facilities have for Ukraine and the world?

The answer to this question depends on many factors. It depends on which of the four NPPs will have an accident, on how many power units, what kind of accident it will be — whether the core will be damaged or not, what the weather will be like, and so on. There are too many factors that can determine possible consequences in case of a conditional accident. Zaporizhzhia NPP is potentially the closest to an emergency situation. Currently, a potential scenario with a complete blackout looks most likely. The occupied NPP is located on the shore of the Dnipro River cascade of reservoirs. Thus, the accident may lead to further radiation contamination of the lower reaches of the Dnipro River and the Black Sea. Then the accident will become transboundary in nature.

What are the main steps to be taken by the Ukrainian government and the international community to ensure nuclear safety in the future?

The international security system in the field of nuclear energy use needs a really serious update. Before the full-scale invasion of Russia, no one thought those reactor facilities or spent fuel storage facilities could be at the epicentre of hostilities. All NPPs in the world were built to operate in peacetime. Therefore, new norms and rules should be developed, considering the Ukrainian experience, first of all, to prevent the recurrence of such situations in the future. Any country that might want to repeat nuclear blackmail should understand all the consequences of its actions. Similarly, Russia must be punished for what it is doing now. There can be no cooperation with a terrorist country. All existing agreements must be terminated.

It is mind-blowing that after Russia's attacks nuclear energy is still perceived as safe



When we talk about the environmental impacts of Russia's aggression, nuclear risks are definitely the largest in terms of possible scope and impact. It is totally mind-blowing to imagine that while we are experiencing this new form of terrorism in Ukraine and no one in the world knows how exactly to react, nuclear energy still seems to be perceived as safe globally.

No less important is the current and future environmental consequences from the damage of industrial facilities which cause air, water and soil pollution.

NATALIA GOZAK

Executive Director, Ecoaction

Involvement during Russia's war against Ukraine: Natalia's current professional activity is based on ensuring that Ukraine develops in a safe and clean environment. Natalia has a more than 18-year track record in the environmental civil society movement in Ukraine.

How would you evaluate the impact of war on the environment of Ukraine and its current state, as compared to that before the war?

I have witnessed slow but persistent movement towards higher public interest to environmental safety and transformation of popular social discourse from 'let's clean up the park and recycle waste' to 'how to deal with batteries' and finally towards 'climate change adaptation solutions for cities' and 'zero waste municipalities'. Moreover, Revolution of Dignity in 2014 has opened many 'official doors' for civil society and has installed a powerful engine of EU-approximation by accelerating reforms in the environmental sphere of Ukraine. Now the clear EU candidacy perspective is creating more possibilities for progress in environmental reforms. Ukraine should use this historic opportunity to modernise and develop a green economy as a part of the EU's climate neutrality pathway. In the coming years our priorities will be shaped around security and the need to address the severe economic decline. However, this does not mean that there is no place for protection of climate and environment. To the contrary, if we follow a green post-war reconstruction pathway and set a clear sustainable transformation goals, all of the aspects mentioned above will complement one another. For example, transition to renewable energy can go hand in hand with ensuring a longer term energy security. Unfortunately, the longer the war continues, the worse the situation may become in terms of degradation of the natural environment and stronger pressure on natural resources. This is caused by attempts to compensate for the lack of arable land and available resources in the situation of the higher than usual demand. That is why at all the levels the number one priority is Ukraine's victory to make sure we can start rebuilding as soon as possible. Meanwhile, we have a lot of work ahead to rebuild the country, the economy, return the people and restore the environment. That's why planning the green reconstruction, engaging communities, civil society, businesses and international partners, implementing the first pilot projects is crucial already today.

Emergencies at industrial enterprises pose extraordinary threat to environment



Today there is growing concern over the actions of the Russian occupiers at the Zaporizhzhia NPP, who resorted to shelling of its territory. All principles of nuclear safety have been violated: high-voltage lines and the nitrogen-oxygen station have been damaged through provocative shelling by the occupiers, weapons, and munitions are stored at the plant, and the dry storage facility for used nuclear fuel is at risk of a damage.

Such actions can lead to considerable radiation contamination of territories not only in Ukraine, but also in the countries of the Black Sea region and Eastern Europe.

DMYTRO AVERIN

Expert Zoï Environment Network (War impact analysis and data management)

Involvement during Russia's war against Ukraine: Dmytro holds an active position on social matters, highlighting the impact of the military actions on the ecology and the environment both in Ukraine and globally. He enjoys the long-term experience of cooperation with the OSCE on environmental issues in Donbas.

How would you evaluate the impact of war on the environment of Ukraine and its current state compared to that before the war began?

The war in Ukraine has negatively affected all components of the environment — soils and landscapes, surface and groundwater, air, biodiversity, etc. Military operations in the industrial regions of Ukraine with a large number of environmentally hazardous objects deteriorate the situation.

The main danger to the environment during the war is associated with pollution through accidents at industrial enterprises. Since the outbreak of the war, almost all industries have experienced attacks across the country, ranging from Donbas, where cities and factories were destroyed, to the central and western regions of Ukraine. Numerous oil depots, power stations, metallurgical, chemical and petrochemical plants, machine-building, food processing and agricultural enterprises have been targeted or have been in a situation, where it was impossible to continue operations due to disruption of logistic routes, electricity and gas supplies, lack of water, raw materials or personnel.

What are potential consequences of nuclear incidents at one of Ukraine's nuclear plants or other nuclear facilities?

For the first time in the history of mankind, war is taking place on nuclear infrastructure sites. The reality of this has called into question the rules that govern the operation of nuclear plants and other radiation-hazardous facilities during wartime, as well as the ability of the international commonwealth to respond to such challenges. Among Ukraine's five nuclear power plants and two research subcritical reactors, three were directly affected by the war, namely: the Chornobyl NPP, Zaporizhzhia NPP, Europe's largest and the world's third-largest nuclear power plant by capacity, and 'Dzherelo neytroniv', the neutron source nuclear subcritical facility in Kharkiv. Other hazardous radiation facilities, located in Ukraine and being therefore at risk, embrace storages of used nuclear fuel and other radioactive waste, sites of underground nuclear explosions, uranium mining and processing facilities, as well as a wide range of research, medical and industrial sources of ionising radiation.

ECONOMY

CHAPTER 2.4



RUSSIAN INVASION CAUSED MASSIVE ECONOMIC DISRUPTIONS AND LIMITED BUSINESS ACTIVITY

The full-scale Russian invasion has had dramatic effects on the Ukrainian economy in the form of a **high level of migration, destroyed infrastructure, blocked export routes, and a growing fiscal deficit**. As of September 2022, the total direct damage caused by the war was **114.5 Bn USD¹ (112% of Ukrainian GDP in 2021)**. At least **131.3 thousand residential buildings, 2,472 educational institutions, 934 medical institutions, 422 enterprises, as well as numerous other objects¹**, have been damaged, destroyed or seized.

Ukraine will need large investments and economic support to return to at least the pre-war state of the economy. But **not only is Ukraine experiencing economic difficulties**. As a result of the war, growing inflation and rising interest rates of the World Bank **slowed down the global GDP growth projection for 2022 from 4.1% to 2.9%²**, which will affect people and businesses all around the world. For that reason, it is highly important to understand the scope of the impact of war **on the Ukrainian economy** and the plan for its recovery.



Economy

The section discloses key aspects of the Ukrainian economy, which has suffered the most from the full-scale Russian war in Ukraine or will have high investment potential after the war, including:

- Agriculture
- Mining & Manufacturing
- Energy
- Transport & Logistics
- IT



Agriculture

- The development of agriculture in Ukraine before the war
- The consequences of military actions on sowing campaign
- The possible threat of global famine



Mining & Manufacturing

- The state of mining & manufacturing before the Russian aggression
- The impact of the Russian invasion on industry potential
- The impact on global consumers due to the war



Energy

- The overview of the energy sector in Ukraine before the invasion
- The impact of the Russian invasion on the energy balance of Ukraine
- The impact of the war on global energy prices



Transport & Logistics

- The state of the transportation system in Ukraine before the war
- The impact of the Russian hostilities on the infrastructure
- The emerging risks to the global transportation system



IT

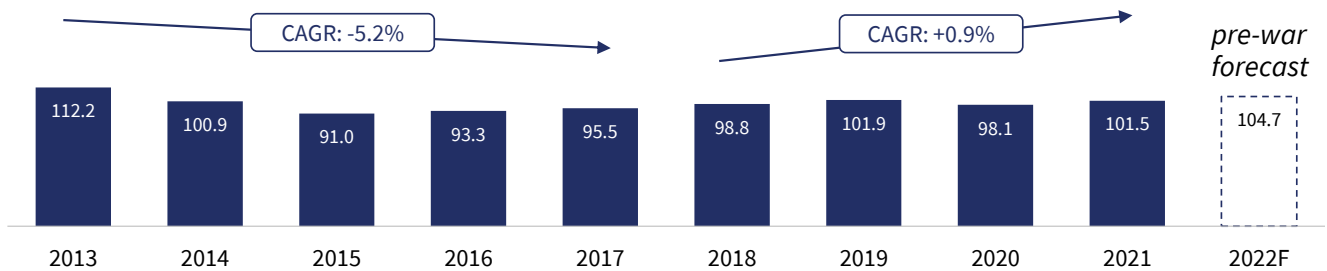
- The current potential of the IT sector in Ukraine
- The impact of the Russian invasion of Ukraine on the IT sector
- The influence of the Russian invasion on the global IT sector

CONDUCTED SECTORAL REFORMS FORCED THE UKRAINIAN ECONOMIC RECOVERY AFTER 2014-2015

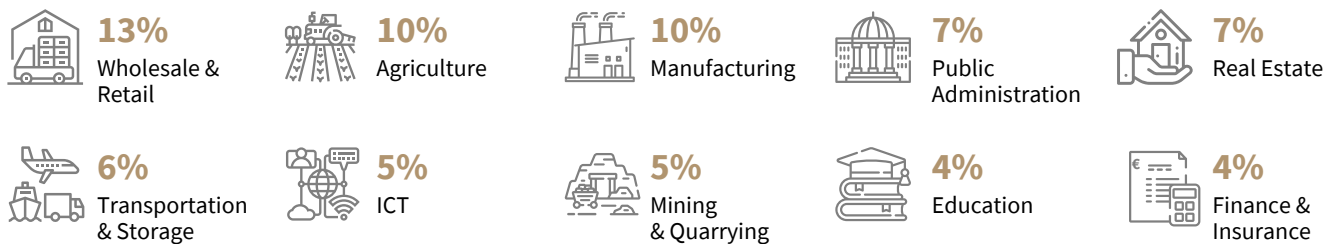
The **annexation of Crimea** in 2014 and the start of the military aggression of Russia in Donbas **deprived 20% of the Ukrainian economy**, while the **total damage amounted to 150 Bn USD**. In 2015, real GDP decreased by 9.8% compared to 2014, and during 2014-2016, the Ukrainian economy **lost 38% of its GDP because of the banking system crisis**. To cope with the **growing inflation and budget deficit**, the government conducted a number of

reforms **to stabilise the macroeconomic and fiscal policies**. Another disruptive factor impacting the Ukrainian economy was the COVID-19 pandemic that started in 2020, causing a 3.8% decrease in the Ukrainian GDP compared to 2019. But the increased demand for Ukrainian goods, especially metal and agricultural products, revived economic growth in 2021. Before the war, the GDP was forecasted to grow by 3.2% in 2022.

Ukrainian real GDP, Bn USD¹

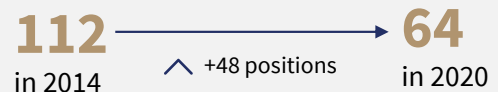


Top-10 industries by share in GDP in 2021²



During 2014-2021, the Ukrainian government conducted reforms that were focused on **improving the business environment, developing the financial sector, and redirecting Ukrainian trade flows from Russia and other CIS countries to Europe**. This had a positive impact on the foreign direct investment flows, including increased export volumes, diversified trade partners, improved competition, and stimulated business development.

Ukraine in Doing Business ranking³



Key reforms and achievements since 2014

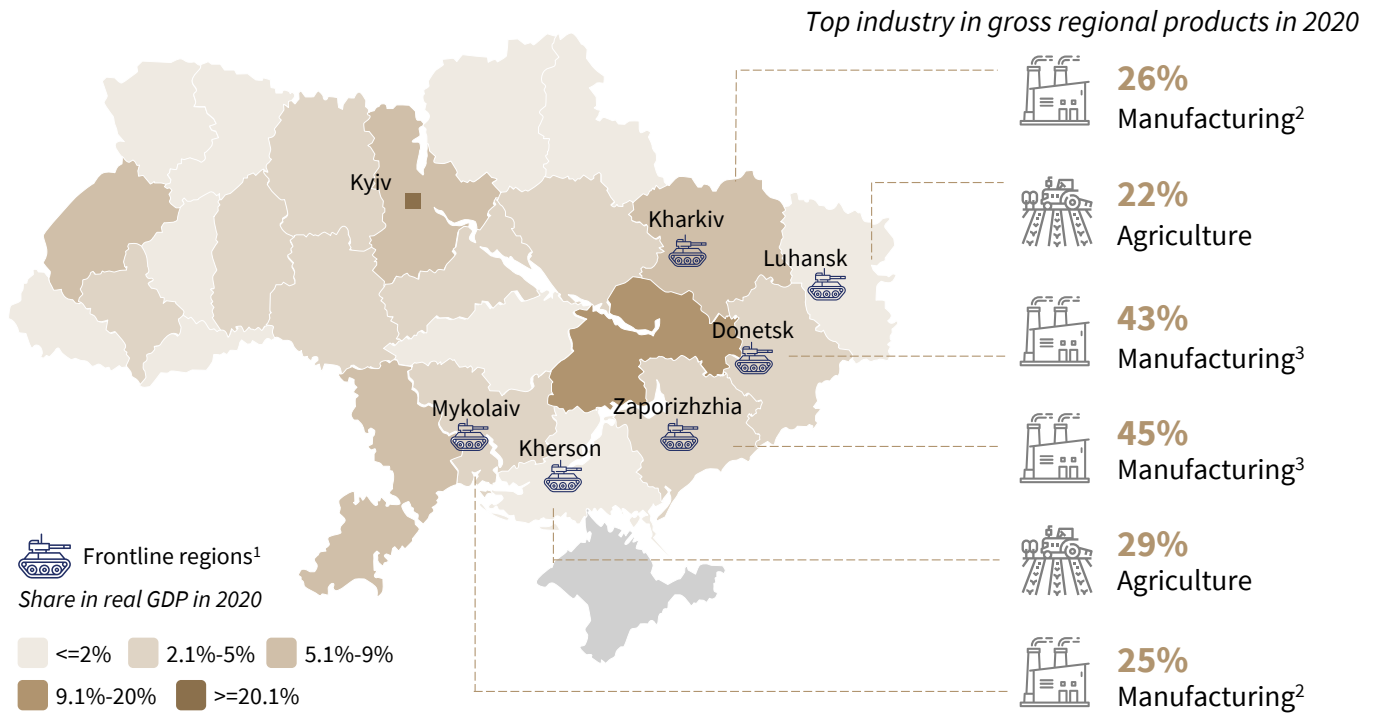
- 1 New Free Trade Agreements with Canada, Türkiye, and Israel
- 2 Independence of the National Bank of Ukraine
- 3 Reform of the banking system & Development of the financial sector
- 4 Launch of the transparent public procurement system 'Prozorro'
- 5 Decentralisation aimed to increase the role of the local government
- 6 Deregulation aimed to create favourable Doing Business conditions
- 7 Digitalisation of public services via the electronic platform Diia
- 8 Land market liberalisation via a lifted moratorium on agricultural land sales
- 9 Received EU candidate country status recently

IN 2022, UKRAINIAN GDP IS PROJECTED TO DROP BY 45% REFLECTING DAMAGE CAUSED BY THE WAR

The current frontline regions historically specialise in metallurgy, mining & quarrying, and agriculture. In 2020, there were **~73,000 enterprises employing almost 4 million people**, and the regions generated **20% of Ukrainian GDP**, with the Kharkiv region being the largest contributor, with a share of 6%.

Having been partially occupied by Russian troops since the start of the full-scale war in Ukraine, these regions are now suffering from intense military actions, making **proper business activities impossible** and **decreasing the total output of the Ukrainian economy**.

Role of the frontline regions in the Ukrainian economy



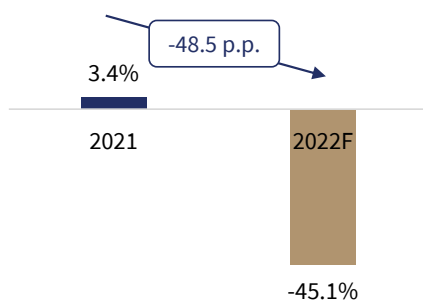
Sectors of the Ukrainian economy by top share of revenue generated in frontline regions in 2020



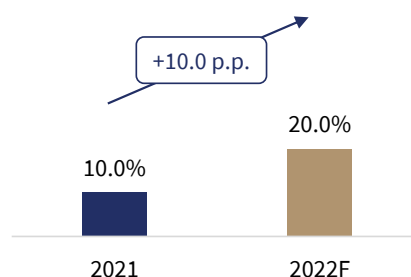
The Russian invasion caused **massive infrastructure disruption and a partial stop of business operations**. To prevent the collapse of the economy, the government imposed **capital controls, banking sector restrictions, and tax deferrals**, while the NBU⁴ increased the **key interest rate to 25%** to control inflation. Nowadays, the growing fiscal gap is another challenge as **government expenditures**

continue to grow. Now, Ukraine spends more than **4 Bn USD monthly to support the Armed Forces**, compared to 6 Bn USD in 2021. Yet, from January - May 2022, **tax revenues decreased by 19% compared to the same period in 2021**. To cover disbalances, international partners have already provided funding, but the end of the war is a crucial step to ensuring economic recovery.

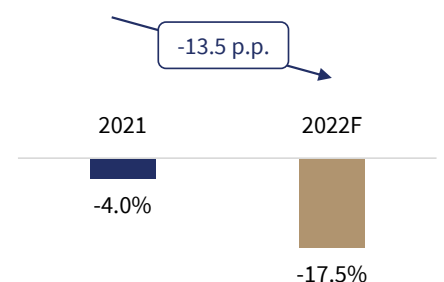
Real GDP growth⁵



CPI⁵



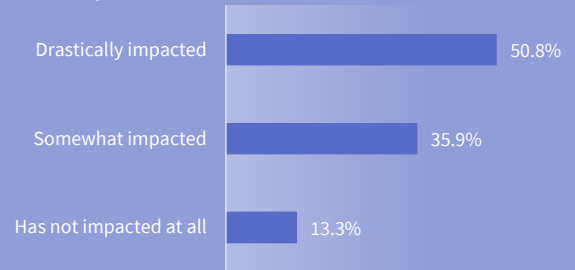
Budget deficit, % of GDP



THE RUSSIAN INVASION NEGATIVELY AFFECTED THE PROFESSIONAL ACTIVITY OF UKRAINIANS

The Russian invasion of Ukraine has **drastically affected the professional activity of almost every Ukrainian**. Some lost their jobs, while others experienced a decrease in the amount of their monthly income. The working model has also changed, with companies either relocating or switching to a remote working format.

Has the Russian invasion of Ukraine affected your field of professional activity? ¹



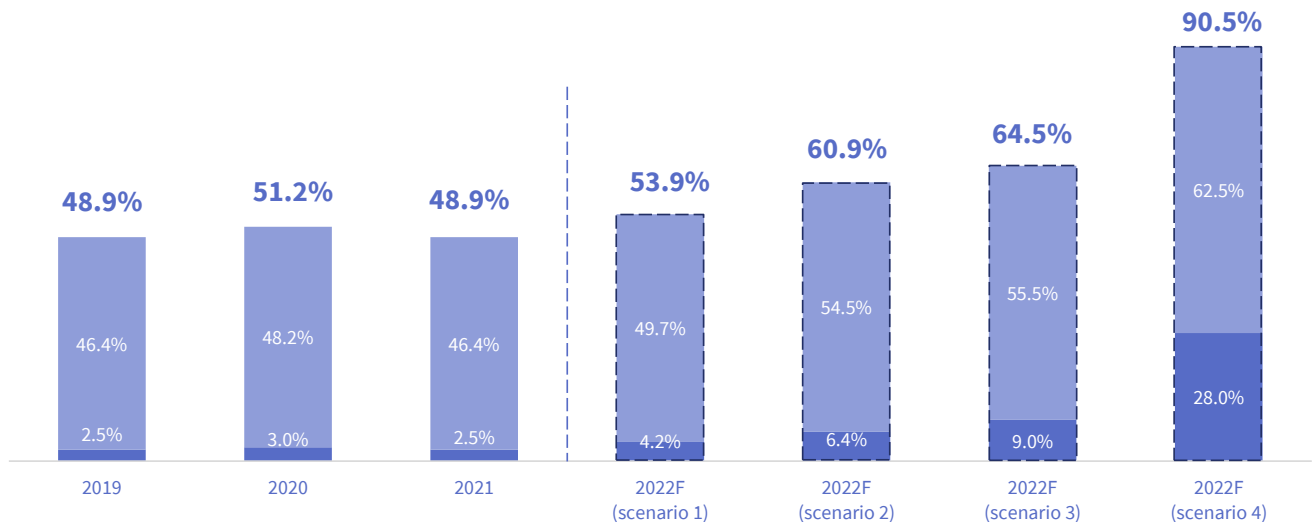
72.3%

share of Ukrainians who have experienced a drop in their monthly income¹

About 50% of Ukrainians have experienced a decline in their monthly income due to the Russian invasion of Ukraine, while a quarter of Ukrainians have lost their jobs. The most difficult situation is observed in the frontline regions, which have been hit the most by hostilities. The decline in the income of Ukrainians has also negatively affected the domestic demand in the country.

Compared to the pre-war level at the moment, the Ukrainian national currency, the hryvnia, is 46% more expensive than the US dollar. **In August 2022, inflation in Ukraine accelerated to about 23% in annual terms**, according to the preliminary estimates of the National Bank of Ukraine. However, the real average consumer goods price increase suggests that a regular shopping check became at least 30% more expensive – all these against the background of decreasing job opportunities and generally non-increasing salaries. Every day of delayed peace will accelerate a freefall into poverty in Ukraine.

Per cent share of Ukrainians living in / vulnerable to income poverty²



In order to maintain the resilience of business operations, as well as **to ensure the security of employees during the war**, Ukrainian companies have actively **switched to a hybrid or remote working format**. As a result, **more than half of Ukrainians are currently working from home or in a hybrid mode**, while only a quarter of them are working offline.



Which work model has your company been using since the beginning of the war?¹

25.9%
Remote / hybrid work before the war³

24.2%
Office work

18.5%
Closure of the physical office

Source: Kyiv Consulting analysis; UNDP — The Development Impact of the War in Ukraine — [2022]

Notes: (1) Ukrainian population survey conducted by Kyiv Consulting, July-August 2022, n=1,000 respondents; (2) UNDP projections of household income in Ukraine as of 16 March 2022; (3) And continues this practice today

A portrait of Anna Derevyanko, Executive Director of the European Business Association (EBA). She is a woman with dark, wavy hair, wearing a black top and a necklace with a circular pendant. She has her arms crossed and is smiling slightly. The background is a blurred cityscape at night.

Few Ukrainian businesses apply for governmental support programmes



In early August, the European Business Association measured investment attractiveness of Ukraine, which considered, inter alia, factors that affected business performance and the overall investment climate of the country.

It is clear that the first place in the ranking was attributed to the war, the second – to corruption and the third – to the weak judicial system, followed by purchasing capacity of the population and logistical issues.

ANNA DEREVYANKO

Executive Director of the European Business Association (EBA)

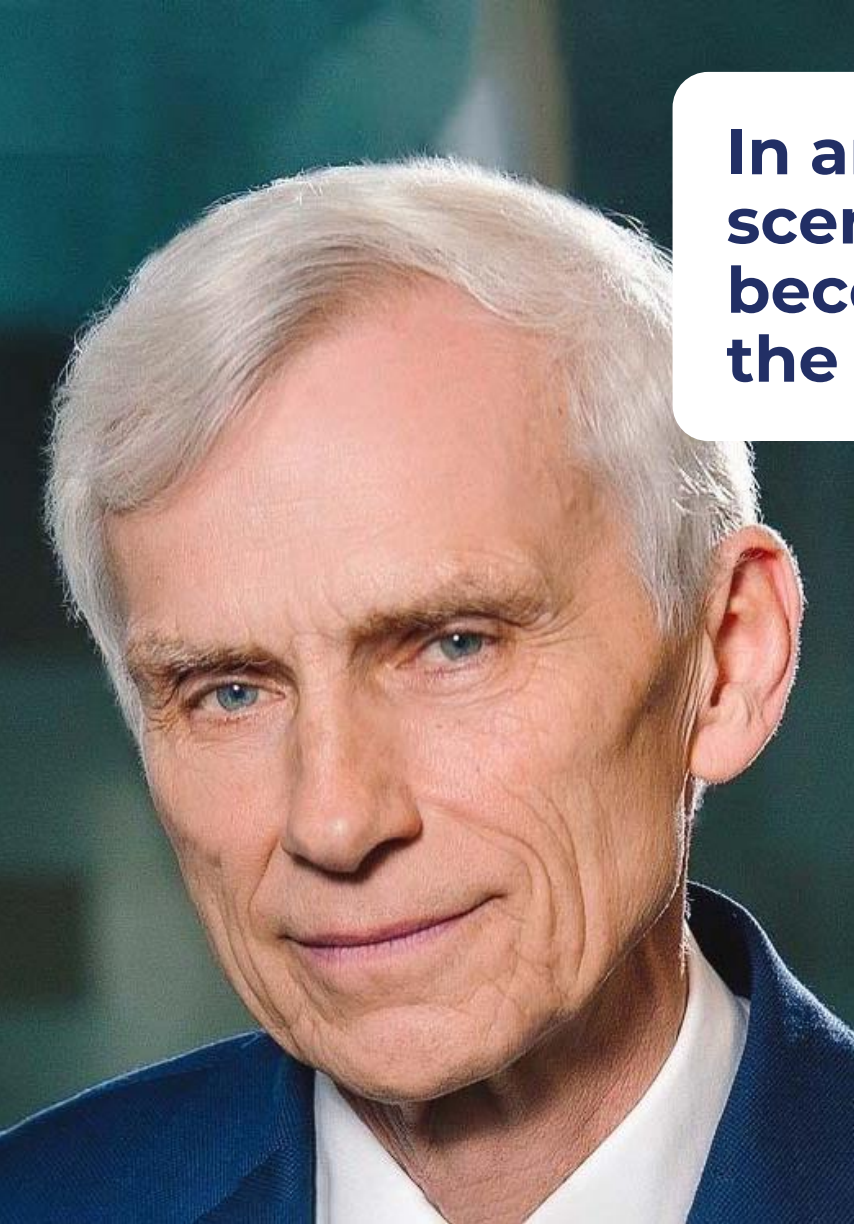
Involvement during Russia's war against Ukraine: Since the beginning of the war, EBA has been engaged in cooperation with private companies and state institutions to support the economy, as well as the Armed Forces of Ukraine. The 'Second Chance Bank' project (first online reuse centre in Ukraine) was transformed to platform for sharing information on military needs with companies willing to provide support.

What government initiatives can help re-launch the business sector, which has been affected the hardest by the country's economic decline?

We see that grant programmes are now being launched, and this is an important signal of businesses' support. However, businesses should have the confidence to apply for such programmes and have faith that they will get the needed funds. Now, according to a survey of microentrepreneurs, who are members of the Unlimit Ukraine (EBA CSR project), we see that 63% of the surveyed entrepreneurs have not used governmental or international programmes to support their businesses. Whereas 16% referred to the option to pay 2% single tax, 6% used other tax benefits, 5% used the 5-7-9 credit programme, 3% said they applied for the e-Robota programme, and 1% used reimbursement for the IDP employment. Therefore, confidence building is probably still worth working on.

What are the main types of problems Ukrainian businesses face during the war?

In early August, the European Business Association measured investment attractiveness of Ukraine, which considered, inter alia, factors that affected business performance and the overall investment climate of the country. It is clear that the first place in the ranking was attributed to the war, the second – to corruption and the third – to the weak judicial system, followed by purchasing capacity of the population and logistical issues. There are certain issues in the dialogue with the public authorities. However, we can see that if we speak honestly and openly about these difficulties, using arguments and facts, then, for the most part, these issues can be resolved and a compromise can be found. For example, until recently, there were indeed some difficulties in communication with representatives of the Tax Service.



In an optimistic scenario, Ukraine can become a member of the EU in 5 years



Membership in the EU will open great market opportunities for Ukrainian entrepreneurs, for agriculture, any industrial production, and services. Border problems will disappear. Ukrainian products will become EU products. Deep intra-industrial cooperation and specialisation will be made possible. Ukrainian companies will become attractive partners not only for all EU companies but also for off-EU companies that would like to be present within the EU.

DR MARCIN SWIECICKI

Ukraine Business Ombudsman (2019-2021); Former Deputy Minister of Economy; Former Mayor of Warsaw

Involvement during Russia's war against Ukraine: Dr Marcin Swiecicki takes an active social position supporting Ukraine, expresses his solidarity with Ukrainian people and raises awareness of Russia's war against Ukraine. Also, he supports Ukraine's accession to the EU, calls on the world to fight terrorists, and help Ukraine with weapons.

11% of Ukrainian businesses have relocated abroad. What should be the state policy to create favourable conditions for these businesses to come back to Ukraine?

I do not think that business return to Ukraine after the war requires too many special conditions. The most important, what is needed already now, is to facilitate border crossing for trucks and trains. I presume that quantity of goods crossing the borders with EU will be growing but conditions on borders are dramatic. Hundreds of vehicles are waiting several days for custom checks, phytosanitary and veterinary control. Corruption is booming. Any company that has trade ties with EU partners will stay abroad, once possible, rather than return behind the border again. Ukraine, Poland, and other EU countries bordering with Ukraine should agree on standards for border crossing, e.g. no more than three hours and do everything to achieve and keep such standards.

What are your projections regarding the ease and duration of Ukraine becoming a member of the European Union?

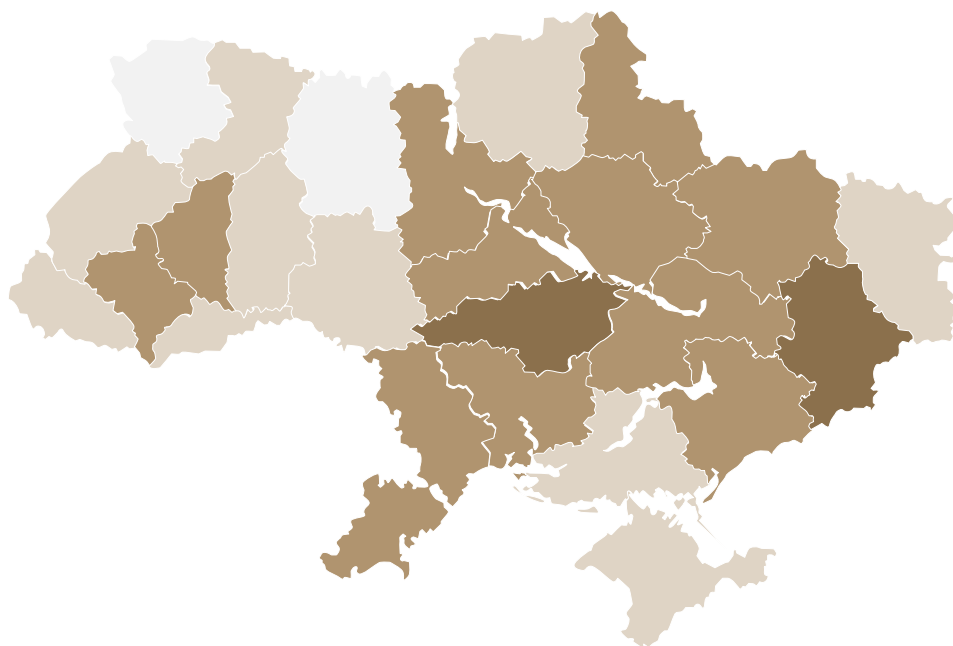
EU will open negotiations on accession after Ukraine fulfils several preliminary conditions, which are fair competitive nominations to the Constitutional Court, NABU, and special prosecutor office, and with laws on media and national minorities, and reform of self-governing judicial bodies and anti-oligarch reform. Ukraine declares that can fulfil these conditions by the end of 2022 so that negotiations on accession could be opened in 2023. In the past enlargements, such negotiations took usually not less than 4 years. Then 1-2 years for ratifications by all member states is needed. Ukraine has privileged conditions since it has been implementing a Deep and Comprehensive Free Trade Agreement with the EU since 2014. DC FTA is based on Acquis Communautaire almost like membership requirements. In optimistic scenario Ukraine can become member of the EU in 5 years.

THE FERTILITY OF THE UKRAINIAN SOIL DETERMINES THE EFFICIENCY OF THE AGRICULTURAL SECTOR

The value of Ukrainian land is determined by two main factors, such as **fertility** and the ability to harvest in local climatic conditions through land **reclamation and fertilisation**. More than **60% of the territory of Ukraine is covered by 'chornozem', a black-coloured soil containing a high percentage of humus,**

providing a high potential for the agricultural sector. Moreover, **Ukraine plays a key role in ensuring global food security, by owning almost 30% of the world's chornozem.** These fertile soils enable the growth of a variety of grains, oil crops, vegetables, and fruits.

Soil fertility map of Ukraine, as of 2021



The least fertile soil The most fertile soil

41.3 million ha

land fund of agricultural land in Ukraine¹

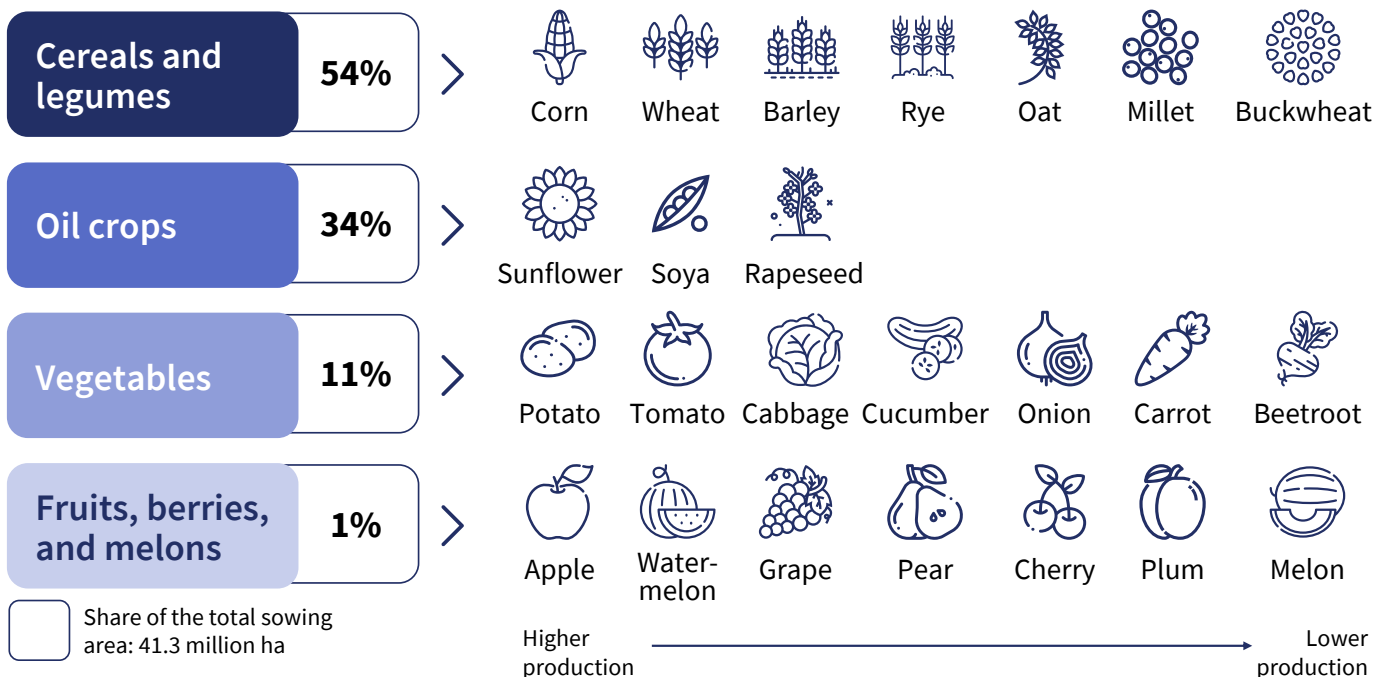
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of the territory of Ukraine is covered by fertile soils

3rd place

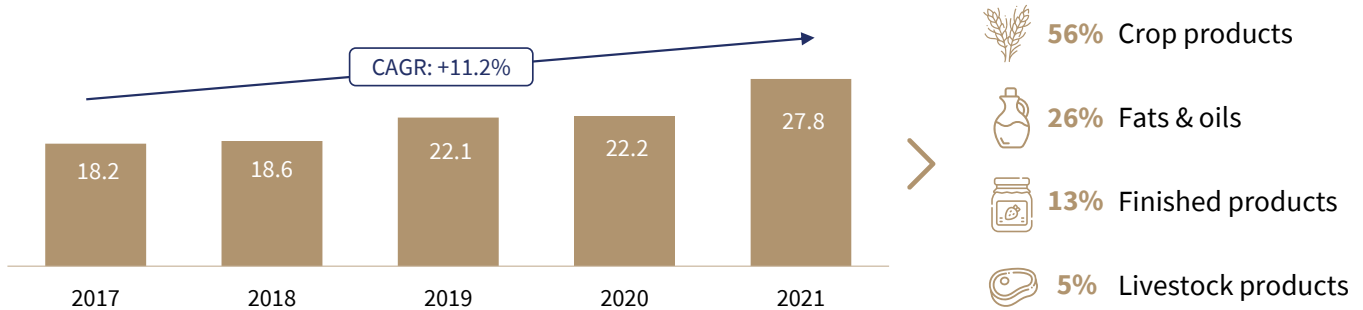
in the world by share of arable land to the total land area — 54%²

Key agricultural cultures growing in Ukraine, as of 2020



IN 2021, THE AGRICULTURAL SECTOR ACCOUNTED FOR 44% OF UKRAINE'S EXPORTS AND 10% OF GDP

Ukrainian export of agricultural products, Bn USD



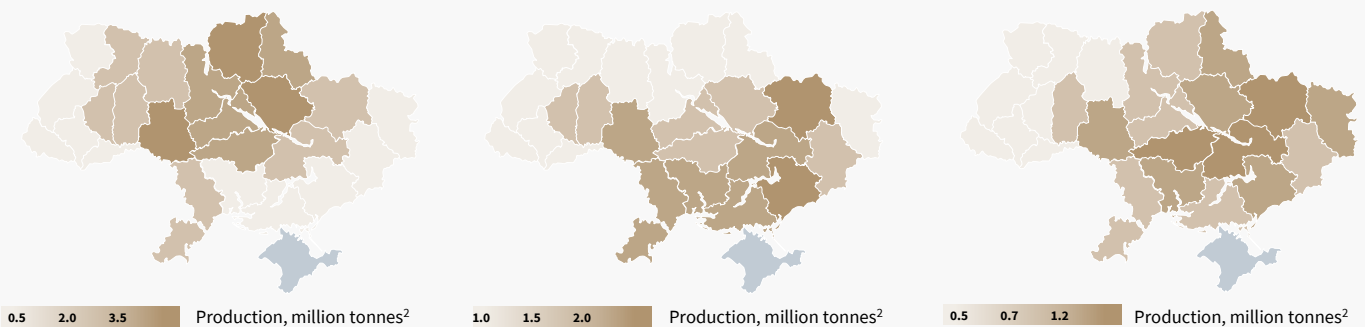
In 2021, the **agricultural sector** had one of the largest shares in the country's real GDP — **10.3%**. In addition, **Ukraine has harvested the biggest crop of cereals, legumes, and oilseeds** since its independence, **thanks to favourable weather conditions and the state aid programme of affordable loans to farmers**. As a result, the agricultural export revenue kept growing and reached a record **43.9% of the total Ukrainian exports**.

Key growing regions of major cereals and oilseeds in Ukraine

5.4 million ha¹

6.8 million ha¹

7.0 million ha¹



Ukrainian main agricultural products, **corn, wheat, and sunflower**, are grown throughout the country, **primarily in the southern, eastern, and northern regions**. In 2021, **Ukraine exported more than half (59%) of its corn and wheat harvest**, as well as **91% of sunflower oil**, becoming the **world's largest sunflower producer and sunflower oil exporter**.

Main products of Ukrainian agricultural export in 2021

Rank in global export	Production, million tonnes	Export volume, million tonnes	Share in global export volume	Export value, Bn USD
#4 Corn	41.9	24.5	13%	5.9
#5 Wheat	33.0	19.4	10%	4.7
#3 Barley	9.9	5.3	13%	1.2
#1 Sunflower oil	5.7	5.2	42%	6.3
#1 Sunflower meal	5.5	4.1	58%	1.2
#3 Rapeseed	3.0	2.3	10%	1.4

Source: USDA — Ukraine Agricultural Production and Trade — [April 2022]; Latifundist — Agribusiness of Ukraine — [2020, 2021]; The Ministry of Agrarian Policy and Food of Ukraine website; State Statistics Service of Ukraine website; UCAB website; Media overview
Notes: (1) As of 2020; (2) As of 2019

IN 2022, THE CROP IN UKRAINE IS FORECASTED TO DROP BY 40% TO NEARLY 65 MILLION TONNES


Ukrainian export of agricultural products

 **65.0 million tonnes**

expected Ukrainian harvest in 2022, a 40% reduction vs 2021

 **48.5 million tonnes**

projected Ukrainian grain harvest in 2022, a 44% drop vs 2021

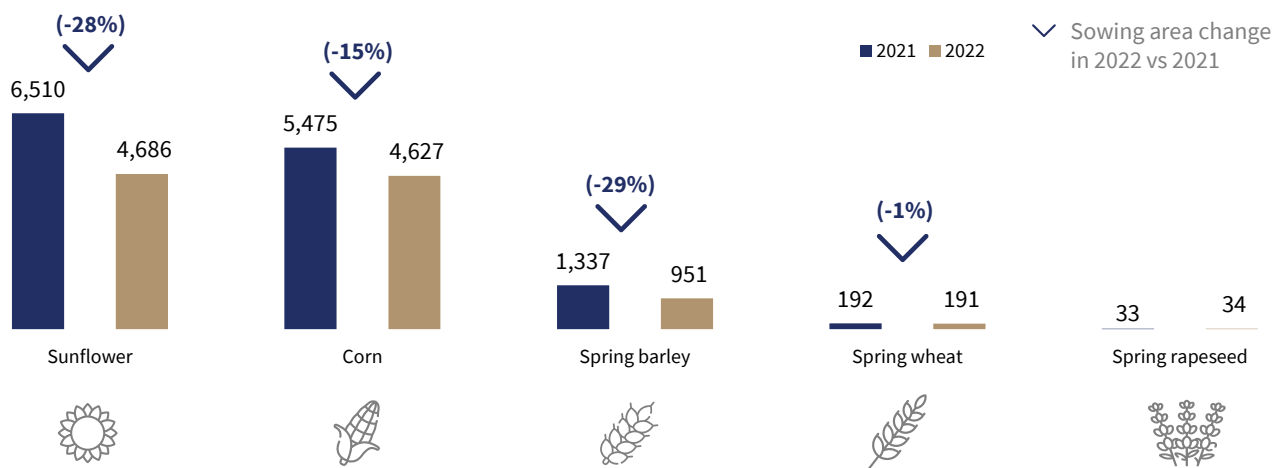
 **Over 500,000 tonnes¹**

estimated amount of grain stolen by Russia from the occupied areas

 **400,000 animals**

livestock that died in regions of active military actions

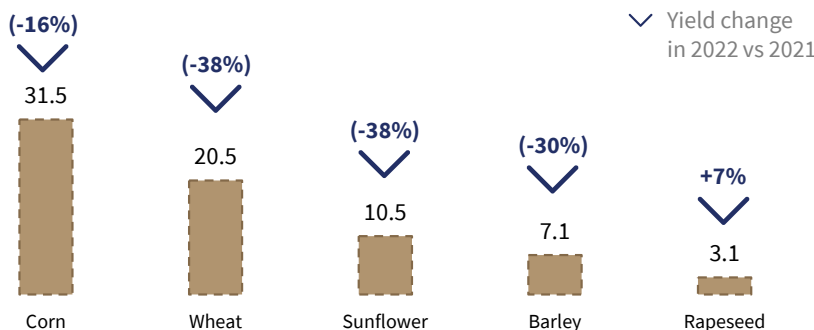
Sowing area in Ukraine by type of key crops, thousand ha²



In 2022, the **sowing area of the main spring crops was 14.2 million ha** — a 16.3% reduction compared to 2021. Meanwhile, **winter crops** (wheat, rye, and barley) were sown on an area of **7.6 million ha**, which was slightly smaller than in the past year. The biggest change, as a result of the hostilities and occupation of

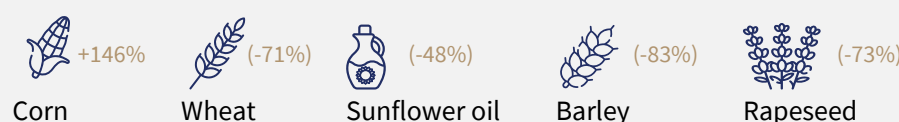
some parts of the country, occurred in the crop structure of sunflower, corn, and spring barley. Not being able to export products because of the blockade of seaports, Ukrainian farmers **have increased the crop area for peas, beans, and buckwheat**, expecting higher demand in the domestic market.

Forecasted yield of grain and oil crops for 2022, million tonnes³



In 2022, the **harvest of the main grain and oil crops** in Ukraine is forecasted to be **about 65 million tonnes**, showing a 40% drop compared to 2021. This year, harvest volumes are expected to meet the domestic demand, thus a decrease in the production of grain and oil crops, leading to **export reduction**.

Export dynamics of the key grain and oil crops, as of September 2022 vs September 2021



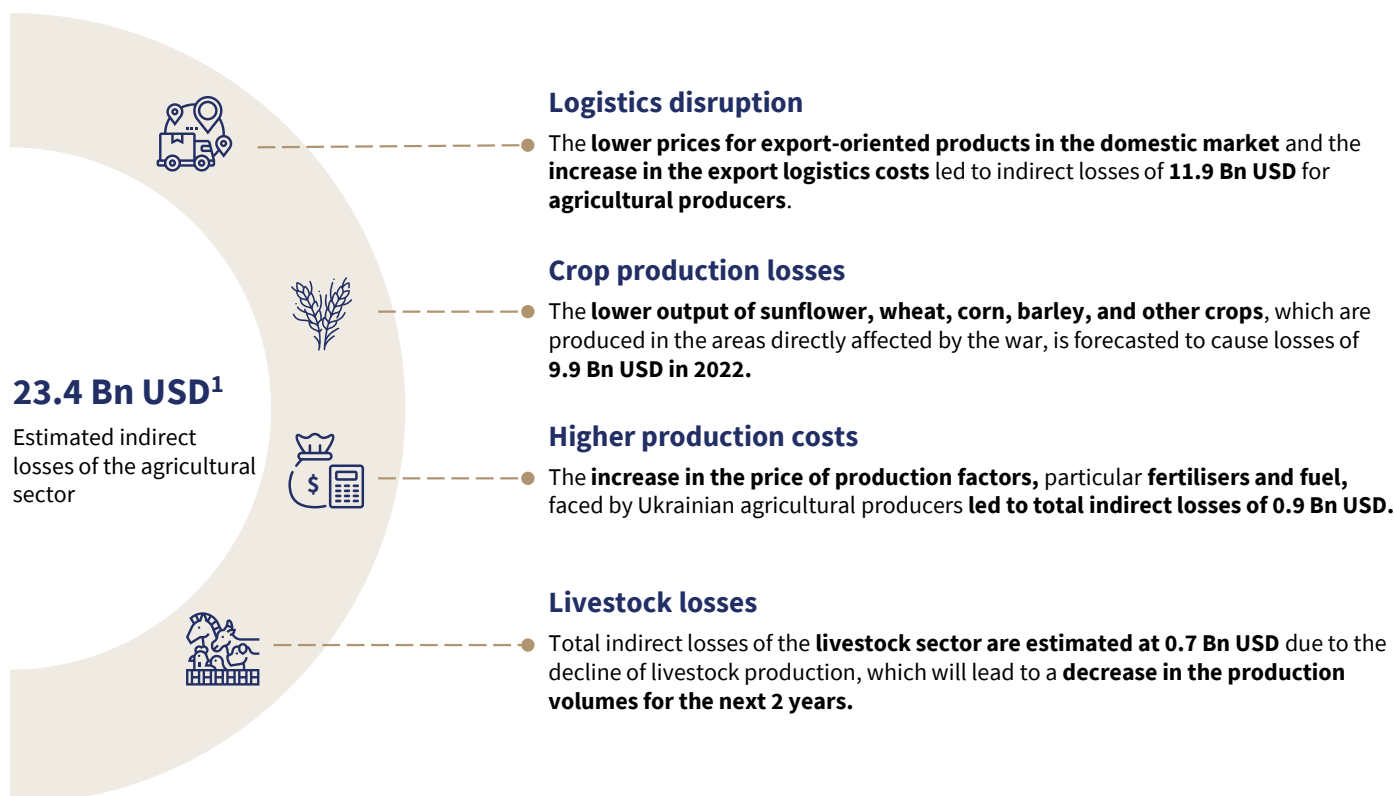
As of September 2022, **export volumes of the main grain and oil crops reduced by 26%**, compared to September 2021, primarily due to the significant growth in corn export volumes.

THE TOTAL DAMAGE TO THE AGRICULTURAL SECTOR CAUSED BY THE WAR IS MORE THAN 27 BN USD

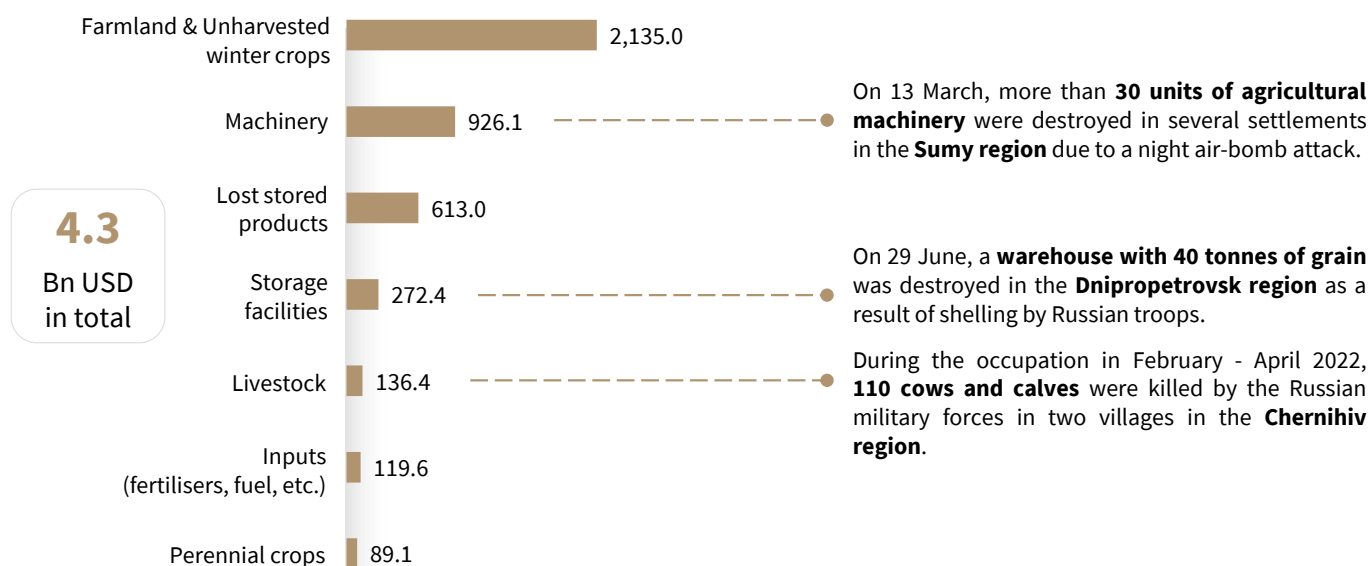
As of June 2022, indirect losses of the agricultural sector of Ukraine are estimated at 23.4 Bn USD due to a decrease in production, the blockade of seaports, and the increase in the price of production factors. In addition, direct losses reached 4.3 Bn USD, accounting for almost 15% of the accumulated capital in the agriculture sector of Ukraine.

Calculations of losses enable an understanding of both the scale of the industry's decline and its lost growth opportunities. Without compensation for losses, farmers in the regions most affected by the war might not be able to resume production in pre-war volumes in the next few years and could close their businesses.

Indirect damage to the Ukrainian agricultural sector, Bn USD¹



Direct damage to the Ukrainian agricultural sector, Mn USD¹



ABOUT 120 MILLION PEOPLE ARE DEPENDENT ON UKRAINIAN AGRICULTURAL EXPORTS



120 million people

worldwide might not be able to get Ukrainian grain crops due to the Russian invasion of Ukraine



By the end of 2024

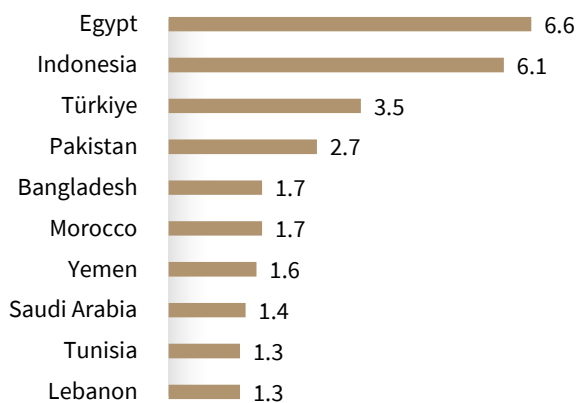
food prices will be kept at historically high levels, exacerbating food insecurity and inflation



36 countries

around the world faced food inflation in 2022 at the level of 15% or higher as of May 2021

Leading importers of Ukrainian wheat in 2021, million tonnes



In June 2022, **Egypt banned the trade of domestically produced wheat** until the end of August, **allowing sales** only to the **government**. In mid-2022, the average price per tonne of **imported wheat already increased by approximately 100 USD** compared to 2021.

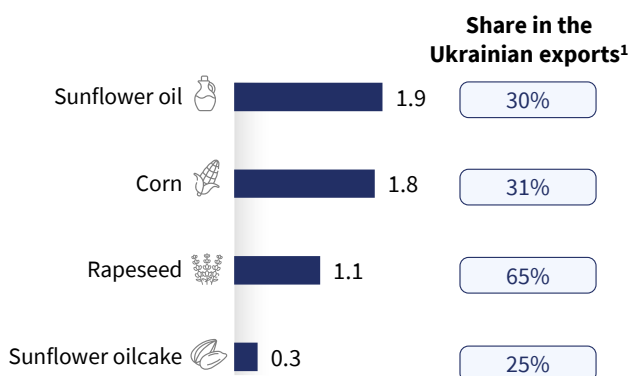
In March 2022, the **production cost** of subsidised **bread** in **Tunisia**, which **imported about a third of its wheat from Ukraine**, has already been **twice higher** than its **selling price**, while local bakeries report a **lack of grain**.

In **Lebanon**, the **price of bread has increased by 27%** since February 2022. In March 2022, the national government started to negotiate **international support in financing the grain import**, on which Lebanon spends about **20 Mn USD per month**.

Despite the dependence on Ukrainian exports, **none of the leading importers of Ukrainian wheat initiated imposing sanctions against Russia**. **Indonesia** declared its **readiness to participate in the restoration of medical infrastructure**, while

Pakistan provided humanitarian aid, including medicines and food. Since the start of the full-scale invasion, **Türkiye took a position of neutrality**, maintaining contact with both Ukraine and Russia.

Main products of agricultural export from Ukraine to the EU in 2021, Bn USD



In 2021, **sunflower oil imports from Ukraine** accounted for nearly **60% of Spain's total imports**. In **March 2022**, **Spanish supermarkets started to ration the sale of sunflower oil**, causing consumers to fear shortages and higher prices.

In 2021, the **Netherlands imported nearly 40% of its corn from Ukraine**. In 2022, the import reduction caused a **rise in the price of animal feed** and **increased the production cost price for pig farmers in the Netherlands**.

OPINION CORNER

Kostiantyn Aleksandruk
Talks about Agriculture, Harvest, and Export



The sowing campaign in 2022 was extremely complicated for Ukraine: burning fields, a decrease in lending, and rising prices for diesel fuel and mineral fertilisers are just some of the factors that contributed to the impoverishment of farms. **Ukraine fully realises the responsibility we bare before the countries that depend on our agricultural products**, which is why the **farms continue working alongside which physical risks and economic complications**.

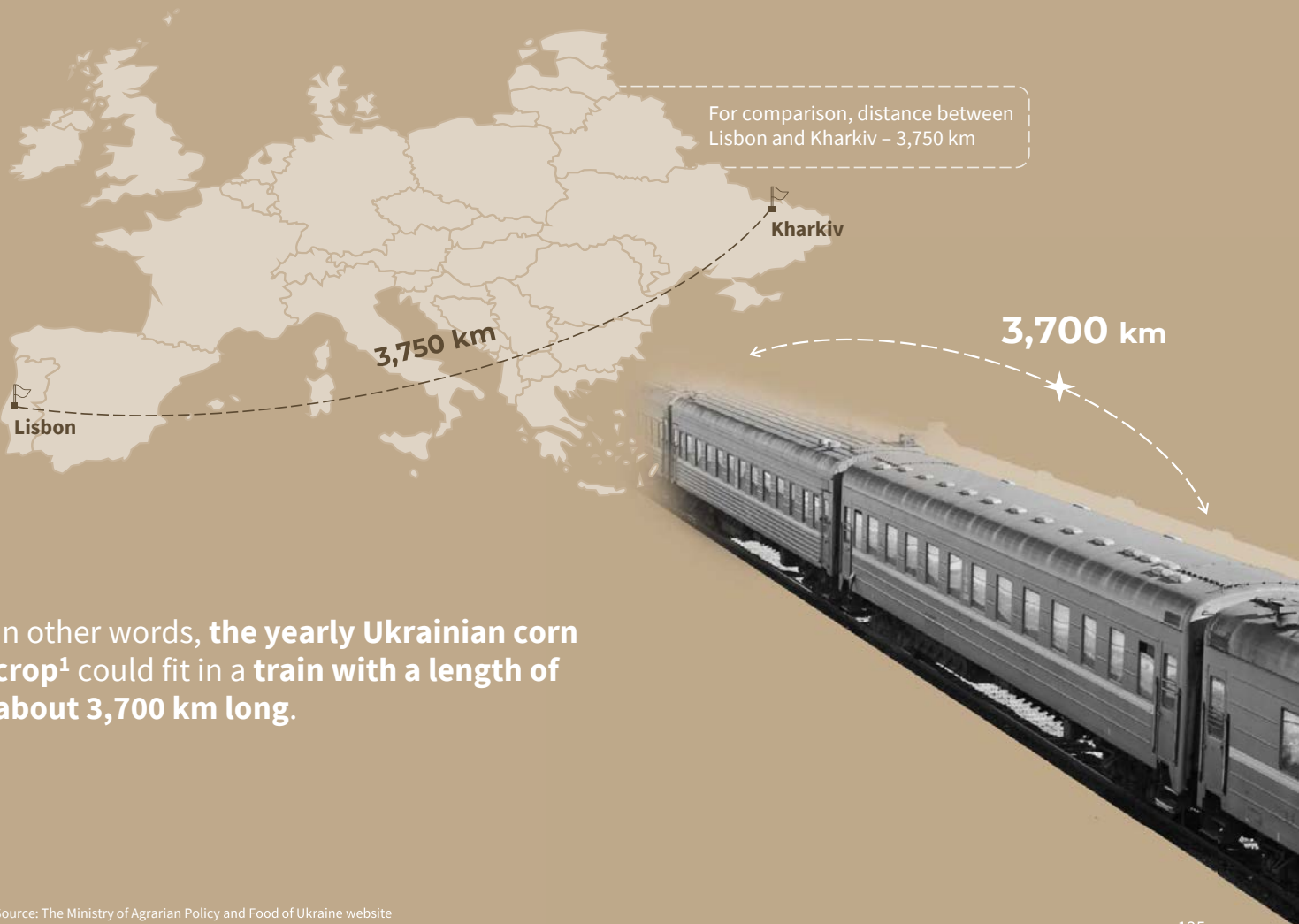
Source: World Bank website; United Nations website; Forbes website; Latitudist website; The United States Institute of Peace website; Media overview
Notes: (1) Share of the European Union in the total export volumes of Ukraine in 2021

DID YOU KNOW THAT THE YIELD OF CORN IN UKRAINE HAS INCREASED BY 50% SINCE 1991?

x43



To accommodate the **entire crop of corn grown¹ in Ukraine in one year**, **43 olympic stadiums** would be needed.



In other words, **the yearly Ukrainian corn crop¹ could fit in a train with a length of about 3,700 km long.**

THE WAR CAUSED THE GLOBAL FOOD PRICE INDEXES GROWTH TO HIGH HISTORICAL LEVELS



~96%

of Ukrainian grain was exported through seaports in 2021



22 million tonnes

of grain were blocked in Ukrainian seaports as a result of the Russian invasion



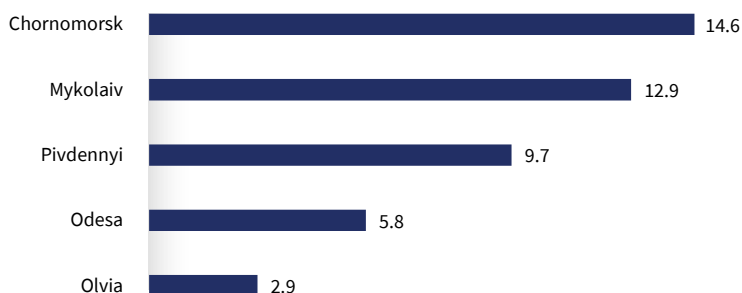
3 Ukrainian seaports

continued to operate in the first months of the war but generated only 10% of pre-war turnover

Ukrainian agricultural production significantly exceeds its domestic consumption; **about 70% of all agricultural products are exported**. Thus, **Ukraine has been participating in ensuring global food security for many years**, exporting most of the grain and oil harvest to the countries of Europe, Asia and Africa. From

the first days of the Russian war against Ukraine, the **Russian military blocked almost all Ukrainian seaports**, the country's main export routes, **disabling the export of Ukrainian agricultural products**, which **affected global food security and caused a sharp price increase**.

Top-5 Ukrainian ports by grain transshipment volume in 2021, million tonnes



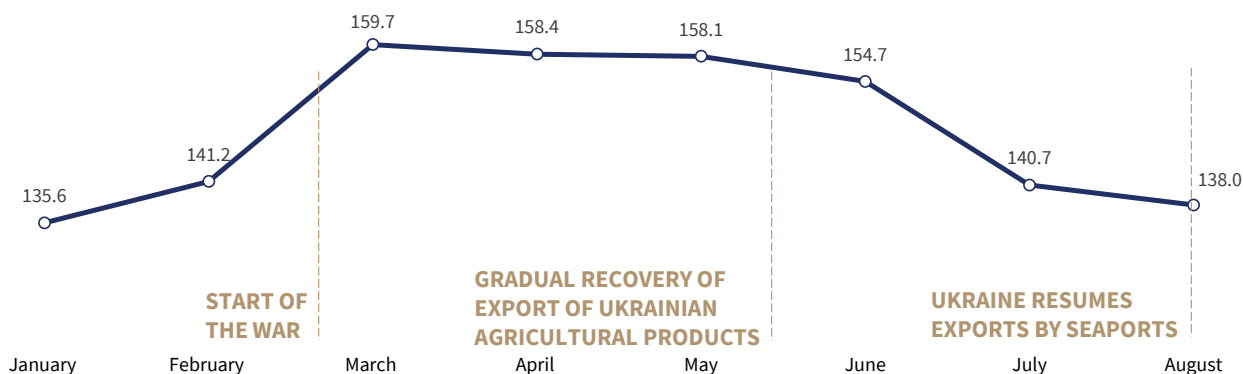
In 2021, **five key ports of Ukraine provided more than 90% of grain transshipment**. All of them were **blocked by the Russian military without a possibility of ships entering or exiting from the beginning of the Russian Invasion of Ukraine in February 2022 until August**. In addition, about 70 ships were blocked in Ukrainian seaports during that period.

After the Russian invasion of Ukraine in February 2022, global food prices rose sharply and reached the highest historical level in March. The **higher food prices** were mainly driven by **supply shortages of key commodity crops, such as wheat, corn, and oil seeds**. Russia's war against Ukraine also led to **fuel and fertiliser price growth worldwide**, causing further **food shortfalls and price increases**. The war has already proved to create challenges for global

food security, especially in low-income and import-dependent countries in Africa and Asia. In addition to the rapid global increase in food prices and the shortages of grain and bakery products in some countries, civil protests continue to occur in poor countries.

Russia's war against Ukraine, as well as droughts, which are getting worse worldwide, could have a major negative impact on global food security.

FAO Food Price Index dynamics¹



Global food prices rose sharply and reached the highest historical level in March 2022 after the Russian invasion of Ukraine. Higher fertiliser and fuel prices, as well as food supply shortages, affected global food prices to remain at extremely high levels for months. Despite the ongoing hostilities, **Ukraine managed to increase the volume of exports of agricultural**

products by rail, affecting the global food prices to decrease gradually. The **Black Sea Grain Initiative**, signed by Ukraine and Russia with Türkiye and the United Nations, **enabled the export of grain and food products from three Ukrainian seaports, impacting global food prices decrease and providing more steady food security.**

108 SHIPS EXPORTED GRAIN AND FOOD PRODUCTS FROM UKRAINE TO MORE THAN 20 COUNTRIES

After the beginning of the full-scale Russian invasion, **Ukraine started exporting grain to the EU by railway because of the Russian blockade of its seaports.** However, the volumes of railroad export of agricultural products were significantly lower than pre-war and export volumes in 2021.

On 22 July, **Ukraine and Russia signed an agreement with Türkiye and the United Nations, called the Black Sea Grain Initiative¹, which enabled the unblocking of the export of**

grain and food products from the Ukrainian seaports of Odesa, Chornomorsk, and Pivdennyi. On 1 August, the first ship with 26 thousand tonnes of Ukrainian corn left the Odesa seaport in the direction of Lebanon, but the receiving party refused the cargo because of the delay in shipment.

As of 9 September, 108 ships left three Ukrainian seaports for grain and food products transportation to more than 20 countries in Asia, Europe, and Africa.

Ukrainian railroad export transportation of grain, sunflower oil, and meal, thousand tonnes



Since the launch of grain, sunflower oil, and meal railway export to the EU, Ukraine targets to increase the maximum capacity of transshipment railway stations to about 1.5 million tonnes of grain per month. From March - August 2022, **Ukraine exported almost 4.4 million tonnes of grain and about 1 million tonnes of sunflower oil and meal by railroad.**

Unblocked Ukrainian seaports participating in the Black Sea Grain Initiative²

During almost 40 days of operation of the Black Sea Grain Initiative, Ukraine exported almost 2.5 million tons of agricultural products from three seaports.

The largest volume of agricultural products, about 1 million tonnes, was exported from the Chornomorsk port, almost 900 thousand tonnes were exported from the Pivdennyi port, and more than 600 thousand tons from the port of Odesa.

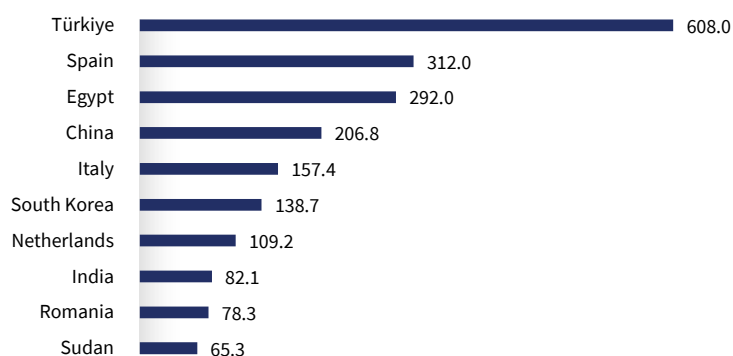


The volume of exports of the main agricultural products within the Black Sea Grain Initiative²



Total volume of exports of agricultural products: **2.5 million tonnes**

Leading importers of the Ukrainian grain and food products within the Black Sea Grain Initiative, thousand tonnes²



Asia was the main export direction of the Ukrainian grain and food products, with 44% of the total volume, 36% was exported to Europe, and 20% more to Africa.

According to trade agreements concluded by Ukraine and respective countries in the pre-war period, Türkiye, Spain, and Egypt became the largest importers of corn from Ukraine within the Black Sea Grain Initiative, while wheat was primarily imported by Türkiye, Egypt and Sudan. In addition, India, Türkiye, and Italy became the main importers of sunflower oil.

Sources: The Ministry of Infrastructure of Ukraine website; The Cabinet of Ministers of Ukraine website; Ukrainian Railways website; UN website; Media overview
Notes: (1) Also called the Initiative on the Safe Transportation of Grain and Foodstuffs from Ukrainian ports. The validity of the initiative is 120 days, and it could be automatically extended if neither side decides to terminate it; (2) As of 9 September 2022



Farmers are forced to restructure planted areas



Agribusiness today requires stable support more than ever, in particular, a fair, simple, predictable, and transparent tax system based on a permanent tax model, as well as simplified relations between business and the state. The so-called 'resource' law on the balance of budgetary revenues must work, which envisages the implementation of a minimum tax obligation.

IGOR CHYKIN

Director of Agribusiness, Kernel

Involvement during Russia's war against Ukraine: Despite the fact that the most intensive military actions are localised in the regions, where Kernel has substantial farming operations, Igor's team has launched a sowing and harvesting campaigns, doing everything possible to ensure food security to avoid humanitarian disaster for the whole world.

What changes are expected in the production of the main crops in Ukraine? Will all the main crops in Ukraine remain the leaders in terms of production volumes in the next 5-10 years?¹

The most significant changes will be in sunflower and maize crops production. Relatively low energy intensity, a high proportion of internal processing, historically high yields, and resistance of plants under stress conditions – high temperatures and moisture deficit – are the factors that encourage Ukrainian agro-producers to choose to increase the planting of sunflowers. The expected reduction in maize planted area is caused by the high level of energy intensity of the crop, the significant increase in logistics costs due to the collapse of steady supply lines, and the unprecedented rise in the price of gas and mineral additives. This will be a logical way to optimise the land area of agricultural enterprises.

What reforms should be implemented in Ukraine to improve business conditions and profitability for crop producers and grain traders?¹

Agribusiness today more than ever requires stable support, in particular, a fair, simple, predictable, and transparent tax system based on a permanent tax model, as well as simplified relations between business and the state. The so-called 'resource' law on the balance of budgetary revenues must work, which envisages the implementation of a minimum tax obligation. This is a good initiative that encourages agricultural producers to pay taxes fairly at different levels by eliminating 'grey' schemes. Combating unfair competition through the implementation of a new tax model with simple and clear rules for all market participants will help the responsible business to survive and continue its development, and strengthen the country.



Small farmers are highly dependent on crediting



Small producers of agricultural products now face a problem of insufficient credit, because the banks have reduced the volume of credit, which is necessary for the implementation of the autumn and spring sowing campaign.

Therefore farmers desperately need government assistance in the form of investments or grant programmes, as banks do not provide sufficient financing.

HRYHORII SHAMRYTSKYI

Chairman of the Congress of Farmers of Poltava region, farm owner

Involvement during Russia's war against Ukraine: Hryhorii and farmers from his community have been packing humanitarian aid, particularly food for the military in Kyiv and the Kyiv region, as well as to Okhtyrka, and Trostyanets in Sumy region. They also helped IDP in the Poltava region by providing food packages. Also, together with the farmers, they bought a car for the local territorial defence.

How would you characterise the sowing campaign this year? What problems did the farmers of Poltava region face this year?

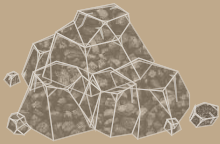
It was the most difficult sowing campaign in the entire history of the Independence of Ukraine. Typically, farmers would hold their crops until spring to sell at higher prices than at harvest to raise funds for the seed company and pay off debt. But with the beginning of the war, the prices of grains, such as sunflower and wheat, fell dropped twofold. Farmers had lunch several times. In addition, banks reduced lending volumes or stopped lending altogether in February, despite long-term relationships and prior agreements. This factor also made it difficult to conduct a seed campaign. The third point that affected the severity of the sowing company is the price of diesel fuel, which has increased in price 3 times, and the price of mineral fertilisers. Accordingly, the number of fertilisers used during sowing was less, we were forced to save on fertilisers, cultivation, trips, and plant protection products.

Which investment projects in the agricultural sector of the Poltava region could be interesting for a foreign investor?

If before the war we were an export-oriented country and most of the types of grain produced by us were exported abroad and processed there, today we understand how important processing is within the borders of our country. For example, buckwheat that came to us from Belarus and Russia became 5-6 times more expensive due to the closure of borders, and we realised that it is more profitable to grow buckwheat, pack it and sell it on the domestic market. Therefore, in my opinion, today it is necessary to invest funds in the agriculture of Ukraine precisely in the direction of the creation of processing enterprises. It is also necessary to urgently increase the volume of animal husbandry because today we produce much fewer animal products than back 15-20 years ago. Programmes for the development of animal husbandry must be developed, because today, during the war, the price of meat has increased by approximately 30-40%, the price of milk has also increased, and the price of grain has decreased twice.

DID YOU KNOW THAT UKRAINE'S LANDS ARE RICH IN MINERAL RESOURCES?

Ukraine's land has mineral resources in high concentrations. Due to the unique raw material base of iron and manganese ores, Ukraine is one of the countries with the most developed ferrous metallurgy in the world.



117 types of minerals

found in Ukraine, out of 120 known

Selected Ukrainian reserves of mineral resources



Coal



Iron ore



Natural gas



Manganese



Salt



Oil



Graphite



Sulfur



Kaolin



Titanium



Nickel



Magnesium



Timber



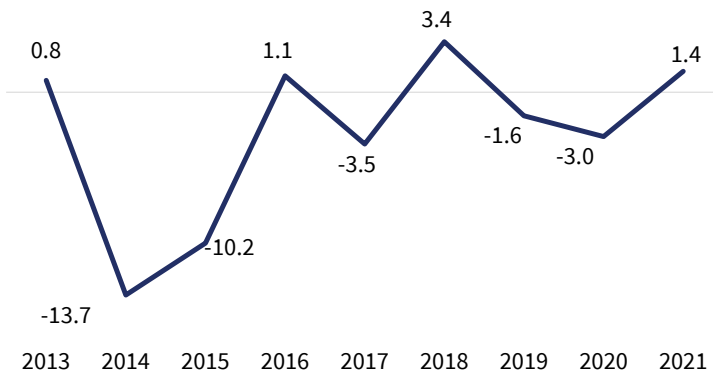
Mercury



Gallium

MINING INDUSTRY HAS HISTORICALLY BEEN ONE OF THE MAJOR SECTORS IN THE ECONOMY OF UKRAINE

Changes in the Index of industrial production in mining in Ukraine, p.p.



The rich mineral resources base in Ukraine determined high reliance of the national economy on mining. In 2021, the industry contributed **almost 5% to the GDP** of Ukraine. It was one of the leading export industries in 2021, with a **12% share** of mineral products (mainly iron ore) **in the country's total earnings from the export of goods**.

As a result of the Russian military aggression, the Index of industrial production in mining **decreased drastically in 2014-2015**, mainly due to the temporary loss of control over a part of the territory of Donbas, where the majority of mines (especially coal) is located.

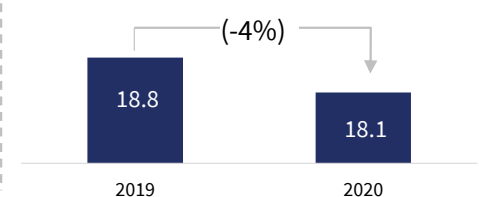
Key findings on the mining industry of Ukraine



Ukraine is one of the **top exporters** of iron ore globally, and it also has the potential to **increase the mining and export of other groups of metals**.¹

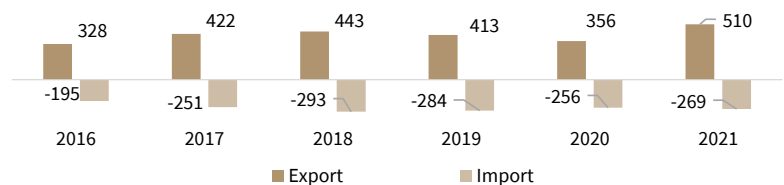
4th largest exporter of iron ore in 2021
45 million tonnes

Reserves of iron ore in Ukraine, billion tonnes



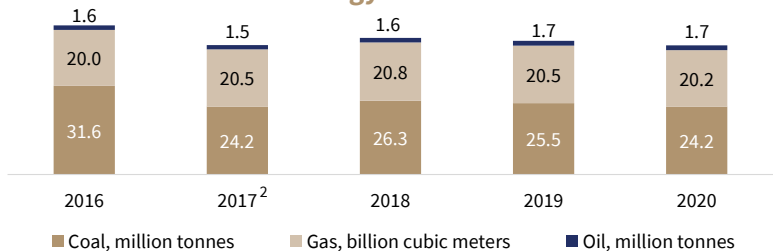
Ukraine has the potential for a larger exploration of non-metallic minerals, which may **reduce the dependence on the import** of certain types of raw materials.

International trade of Ukraine in non-metallic minerals, Mn USD



The current level of exploration and extraction of fuel and energy minerals **does not allow the required level of energy independence** for Ukraine.

Production of fuel and energy minerals in Ukraine



Ukraine's placement in the world by minerals extraction, as of 2020



Metallic minerals

Iron: 6th place globally (7% of global output)³

Titanium: 5th place globally (6% of global output)

Manganese: 7th place globally (4% of global output)



Non-metallic minerals

Kaolin: 7th place globally (4% of global output)

Zircon: 11th place globally (1% of global output)

Graphite: 10th place globally (1% of global output)



Mineral fuels

Uranium: 9th place globally (2% of global output)

Coking coal: 10th place globally (1% of global output)

Steam coal: 12th place globally (0.3% of global output)

UKRAINIAN MANUFACTURING WAS ALWAYS LARGE, YET STRUCTURAL PROBLEMS LIMITED ITS GROWTH

Manufacturing was **the third largest industry in the economy** of Ukraine in 2021, accounting for 10% of the GDP and more than half of the total export of goods. Nowadays, the manufacturing industry includes a wide range of subsectors and has the potential to become the country's economic development driver.

However, over recent years, the industry has been facing a **number of structural challenges**. These include low domestic demand for industrial products, weak integration of the sector into global value chains, low competitiveness of industrial products from Ukraine on global markets, etc.

Key findings on the manufacturing industry of Ukraine in 2021

Sector	Turnover, Bn USD	Share	Change in the IIP 2013/2021 ¹	Export, Bn USD	Employees, thousands ²
Foodstuff, beverages, tobacco	25	31%	(-0 p.p.)	4	286
Metallurgy and metal products	24	29%	(-28 p.p.)	16	185
Rubber and plastic products	8	9%	+20 p.p.	1	114
Engineering	8	9%	(-24 p.p.)	6	287
Wood and paper products	4	5%	(-21 p.p.)	3	71
Chemical products	4	5%	+1 p.p.	3	56
Coke and refined products	4	5%	(-26 p.p.)	1	14
Furniture	2	3%	+3 p.p.	1	103
Pharmaceuticals	2	3%	+6 p.p.	0	25
Textile, clothes sewing	1	1%	(-3 p.p.)	1	70
Manufacturing total	82	100%	(-12 p.p.)	36	1,211



The manufacturing industry in Ukraine is mainly represented by **low-technological sectors** (food, metallurgy, rubber & plastic), while the engineering, chemical, and pharma sectors accounted for only 16% of the total industrial turnover in 2021.



The Russian **military aggression** that started in 2014 caused the destruction of production facilities and logistics infrastructure, as well as the breakdown of regional value chains in Ukraine. It was a major factor in the manufacturing decline from 2014-2021.



In 2021, **ferrous metals became the largest group** in the total country's export value of goods. The share of engineering accounted for only 9% of the export of goods, indicating an insignificant technological focus on the manufacturing industry.

OPINION CORNER

Anna Didenko

Talks about Manufacturing, Economy, Investments, Incentives, and Perspectives

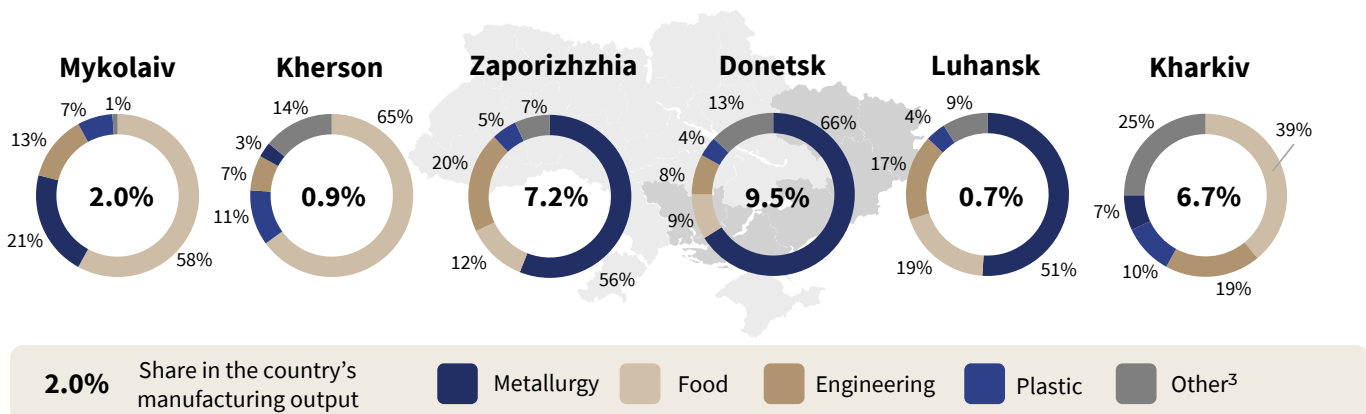


Ukraine has **outstanding potential to become the manufacturing hub in Europe**, with highly efficient production sites. The local economic incentives provided by the Ukrainian government, along with the **necessary investment infrastructure and transparent legal system**, will enable a **favourable investment climate**. The most promising manufacturing areas might be in **heavy machinery, automotive, metals, and defence engineering and manufacturing**.

Source: The Federation of Employers of Ukraine — State of the Industry in Ukraine — [2021]; State Statistics Service of Ukraine website; The Cabinet of Ministers of Ukraine website
Notes: (1) Index of Industrial production; (2) Latest available data for 2020

WAR CAUSED SIGNIFICANT DAMAGES IN THE MINING AND MANUFACTURING INDUSTRIES OF UKRAINE

Manufacturing output structure in the frontline regions^{1,2}



The industrial sector in Ukraine has been significantly affected since **more than a quarter of the country's manufacturing output is located in the frontline regions**. The largest metallurgical and mining enterprises, oil refinery infrastructures, as well as engineering and chemical plants have been either severely damaged or temporarily withdrawn from the national value chains.



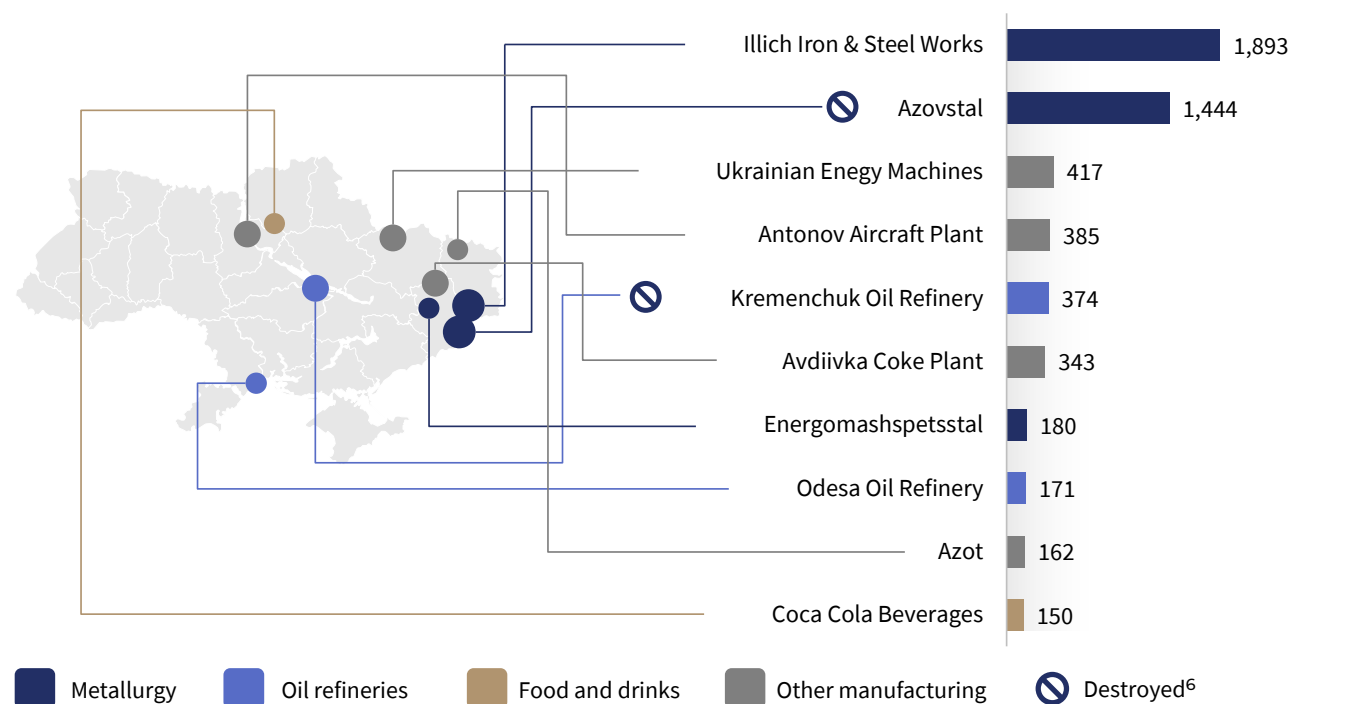
11.9 Bn USD

total material losses of the mining and manufacturing sector of Ukraine due to the Russian invasion⁴

According to the estimations of the NBU, the physical damages in the mining and manufacturing sector as a result of the Russian invasion comprise **13% of the total material losses in the economy**.⁴ However, the total economic losses of the industrial sector of Ukraine caused by disruptions in the value chain and interruption of the production process are much higher.

Top-10 industrial sites that were the most damaged due to the Russian invasion⁵

Assets as of 2020, Mn USD



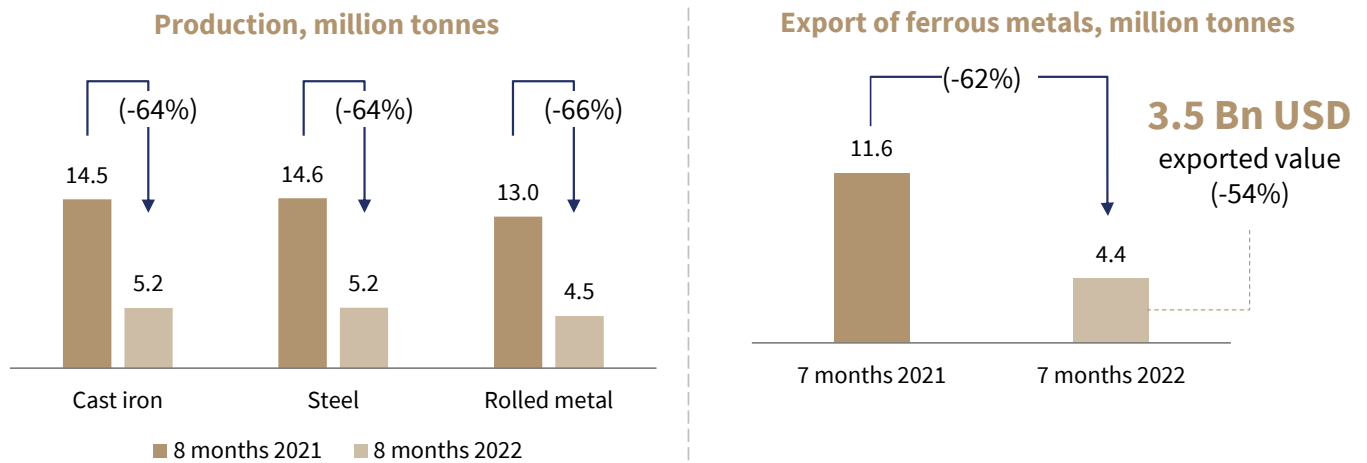
Source: UkraineInvest — Rebuilding Ukraine with Private Sector — [2022]; State Statistics Service of Ukraine website; NBU website; Media overview
 Notes: (1) Frontline regions as of 11 September 2022; (2) Based on the structure in 2020; (3) Including chemical, pharmaceutical, wood & paper, coke & refined sectors; (4) Latest available assessment of the NBU as of 10 May 2022; (5) As of 7 June 2022, latest available assessment; (6) Complete or critical destruction of the facilities that requires the full restoration

METALLURGICAL SECTOR HAS BEEN HIT ESPECIALLY HARD AS A RESULT OF THE RUSSIAN INVASION

Metallurgical sector of Ukraine, which historically has been one of the largest exporters and taxpayers in the national economy, **was significantly damaged due to the hostilities and the occupation** of parts of the Eastern and Southern regions of the country in 2022. Ukraine has lost about 30-40% of production

capacities in metallurgy after the Russian invasion, as they were mostly located in Mariupol, where severe hostilities have been taking place. Except for the physical damages, the industry has also suffered **the breakdown of production chains and a decrease in exports caused by the blockade** of seaports.

Production and export of metallurgical products in Ukraine



Operating status of the selected metallurgical enterprises, as of August 2022



The war in Ukraine significantly affected the operations of the largest metallurgical enterprises. **Illich Iron & Steel Works and Azovstal in Mariupol, which accounted for one-third of the total metallurgical production of the country, were forced to stop their operations** after the beginning of the Russian invasion. Other enterprises reduced or suspended their production due to the breakdown of value chains.

In May – June 2022, **ArcelorMittal Kryvyi Rih and Zaporizhstal restored their operations at reduced capacity**. They focused on replacing the production of metal items that were previously produced exclusively at Azovstal and Illich Iron & Steel Works. However, starting from 1 August 2022, ArcelorMittal was forced to suspend operations of its mining and processing plant in Ukraine for 3 months.

The metallurgical sector of Ukraine has also been suffering losses from the **theft of metal products that were stored in the temporarily occupied territories by Russia**. For example, on 3 June 2022, the first Russian ship, carrying almost 3 thousand tonnes of stolen rolled metal from the Mariupol port, arrived in Russia at the port of Rostov-on-Don.



170 Mn USD

total value of metallurgical products stored at the territory of the Mariupol seaport in the amount of 200 thousand tonnes³

DAMAGES IN UKRAINIAN MINING & MANUFACTURING HAVE NEGATIVELY AFFECTED GLOBAL SUPPLY CHAINS

The role of Ukraine in the global manufacturing supply chains¹



Exporting sector in Ukraine	Key products	Global / regional supply chains	Share in the global trade	Most dependent markets ²⁻⁴
Chemical	Neon gas	Semiconductors	45 - 70% ⁵	Taiwan, Korea, China, USA, Germany
Metallurgy	Pig iron	Steel	22%	USA, Spain, Türkiye, UAE
	Manganese ⁶		18%	Türkiye, Germany, Poland
	Iron ore		3%	Poland, Czech Republic, Romania
	Flat and rolled steel products	Heavy manufacturing	13%	North Macedonia, Slovakia Italy, Bulgaria, Costa Rica
	Titanium ore	Aerospace, Aviation, Automotive, Medical	9%	Czech Republic, Egypt, Romania, Hungary
Engineering	Ignition wiring sets	Automotive	4%	Romania, Germany, Czech Republic

Ukraine is an important supplier of some specific products for the global manufacturing industry. The disruptions in the export of iron ore and iron products, metals, semi-finished metal products, neon gas, and transport equipment from Ukraine have already led to increased pressure on the global supply chain in

various sectors. Steel, heavy manufacturing, semiconductors, automotive, and other industries that rely on supplies from Ukraine **are experiencing shortages of resources and taking action to mitigate the evolving supply chain crisis** caused by the Russian invasion of Ukraine.

The impact of the war in Ukraine on the global manufacturing supply chain



DID YOU KNOW THAT UKRAINE IS A LEADING SUPPLIER OF WIRING HARNESSES?

Wiring harnesses, produced in Ukraine provide

7% of all automotive industry imports into the EU



In 2021, Ukraine's revenue from the export of harnesses reached 1.6 Bn USD

Main EU buyers of Ukrainian wiring harnesses in automotive industry



Volkswagen

Opel

Mercedes-Benz

BMW

Audi



Lamborghini





Metallurgy, chemicals, and mechanical engineering have suffered the most



Using an indicative planning tool and model calculations, we created an industrial investment menu of Ukraine, which collected over 614 promising investment projects in such areas as defence, metallurgy and metalworking, energy, mechanical engineering, logistics, furniture and woodworking, and others.

In general, investments in more than 614 projects, totalling 425 Bn USD will create almost 1 million jobs, and this figure can double if counted with 'spillover' effects (cross-sectoral development).

DENYS KUDIN

First Deputy Minister of the Economy of Ukraine

Involvement during Russia's war against Ukraine: Denys Kudin pays considerable attention to the matter of Ukraine's economic recovery after the war and works on a programme to help Ukrainians who decided to stay in the country. He is also engaged with governments and leading international companies that are ready to help Ukraine and take part in the post-war recovery of the country.

What kind of support has the state provided to industrial enterprises since the beginning of the full-scale invasion?

The war became an extraordinary challenge for the economy. To address it, the Government introduced a wartime economic policy. The priority of this policy is ensuring fast renewal of business activities, including those of the industrial enterprises. The followings policy programmes were launched: SME grants Programme 'e-Robota'; Public Procurement Localisation programme, etc.

We believe our Enterprise Relocation Programme is a success. As of 1 September 2022: 1,823 applications for relocation have been processed, 727 enterprises have moved their facilities from areas of active hostilities, and 529 enterprises have resumed their activities in the safe territories. Among the relocated ones, which have already relaunched their activities at their new locations, 30% are in manufacturing.

Which measures and initiatives should be in focus for Ukraine to become one of the leading industrial hubs in the European region?

Reconstruction of Ukraine as a whole, including industry, will take place within the framework of the Ukraine's Recovery Plan. There were identified sectoral directions (the defence industry sector, metallurgy and metalworking, and the agro-industrial complex sector) capable of ensuring the achievement of the set goal — making Ukraine become one of the leading industrial hubs in the European region.

First, they are traditional for Ukraine, taking a significant share in its economy and are material drivers of Ukraine's GDP and employment. Second, for ensuring development of the agricultural sector, metallurgy and metalworking in Ukraine, we need a sizeable volume of raw materials, having which is a significant competitive advantage in itself. In case of the defence industry, there are established machine-building traditions, relevant scientific and production personnel, as well as the unique experience of their field application.

The US duties are still too high for Ukrainian steel producers to enter the market



In fact, the USA enacted Section 232 several years ago to protect its own market. This clause included additional duties of 40% on all steel products imported into the USA from a specified list of countries. In addition to that, there were also anti-dumping duties, for Ukraine about 39%. This makes our final prices uncompetitive on the North American market.



MAURO LONGOBARDO

CEO of ArcelorMittal, Kryvyi Rih

Involvement during Russia's war against Ukraine: Despite the full-scale Russian invasion of Ukraine, in early April Mauro did his best to keep the company running by personally managing the launch. At that time, ArcelorMittal Kryvyi Rih continued to pay salaries to all its employees. The company also paid taxes in the amount of 75 Mn USD in advance and directed 2 Mn USD for humanitarian aid in Ukraine and the purchase of medicines for medical facilities in Kryvyi Rih.

The USA announced the suspension of import duties on Ukrainian steel and steel products for the period of one year. How do you estimate the potential benefits of such liberalisation?

In fact, the USA enacted Section 232 several years ago to protect its own market. This clause included additional duties of 40% on all steel products imported into the USA from a specified list of countries. In addition to that there were also anti-dumping duties, also for Ukraine (about 39%). So, we did not consider the North American market because we had an additional double duty. I know that there are some senators who are working on this and trying to find an exception to remove the anti-dumping duty. This is still quite a large number for us, and it makes us uncompetitive. That is, the door seems to have been opened, but not completely. I attribute this to logistical issues. Because of logistics, we have huge expenses. And these additional costs prevent you from being competitive. Without this duty of 39% it would be much better.

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Ukraine is known to be one of the key suppliers of metallurgical products for some regions. How has the war influenced the production volumes of metallurgical products?

Ukraine can produce about 24 million tonnes of steel at its current capacity. Most of it is exported. Now, unfortunately, all capacities are reduced.

Some of these capacities have been damaged and cannot be restored in the nearest future. In general, the country currently has enough capacity to produce 14 million tonnes of various metal products. Our company accounts for half of this volume. Here, in Kryvyi Rih, we produce 7 million tonnes of pig iron, of which 6 million are used to produce steel products and 1 million are sold as pig iron products.

As for this entire volume, namely 7 million, 80% was previously exported. The Ukrainian market is not large enough to absorb such a quantity.

Once the war ends, engineers and technical professionals will be in high demand



Steel sector has always been important in the development of Ukraine's economy. In the absence of large construction needs in wartime conditions, the steelmakers' task is to meet the needs of Ukrainian enterprises, export metals, and maintain their production potential.



VICTOR HERASYMCHUK

Head of repair and maintenance department in TREI-UKRAINE, construction subsidiary of ArcelorMittal Kryvyi Rih

Involvement during Russia's war against Ukraine: TREI-UKRAINE supports the Ukrainian military by supplying night-vision devices, while its workers take part in volunteer activities to help people affected by the war.

How has the war affected your work directly? How has the workload of your company changed compared to the pre-war times?

With the outbreak of large-scale invasion, the workload of the company decreased sharply — by more than a half. There were difficulties with the logistical component — supply of equipment and spare parts, especially of foreign production. Also, the management decided to partly switch to remote work.

How do you estimate the role of the steel sector in ensuring the functioning of the Ukrainian economy under wartime conditions?

The steel sector has always been important in the development of a country's economy. In the absence of large construction needs in wartime conditions, the steelmakers' task is to meet the needs of Ukrainian enterprises, export metals, and maintain their production potential.

Is it possible to resume the functioning of Mariupol metallurgical plants after the de-occupation of the Donetsk region?

I think that it is necessary to renew the functioning of metallurgical plants. It is stipulated by the location of metallurgical works in Mariupol from the developed port and rail infrastructure. The supply of iron ore and coke raw materials is carried out from the Donetsk and Dnipropetrovsk regions.

How do you assess the prospects for employment in the steelmaking / metallurgical profession once the war is over?

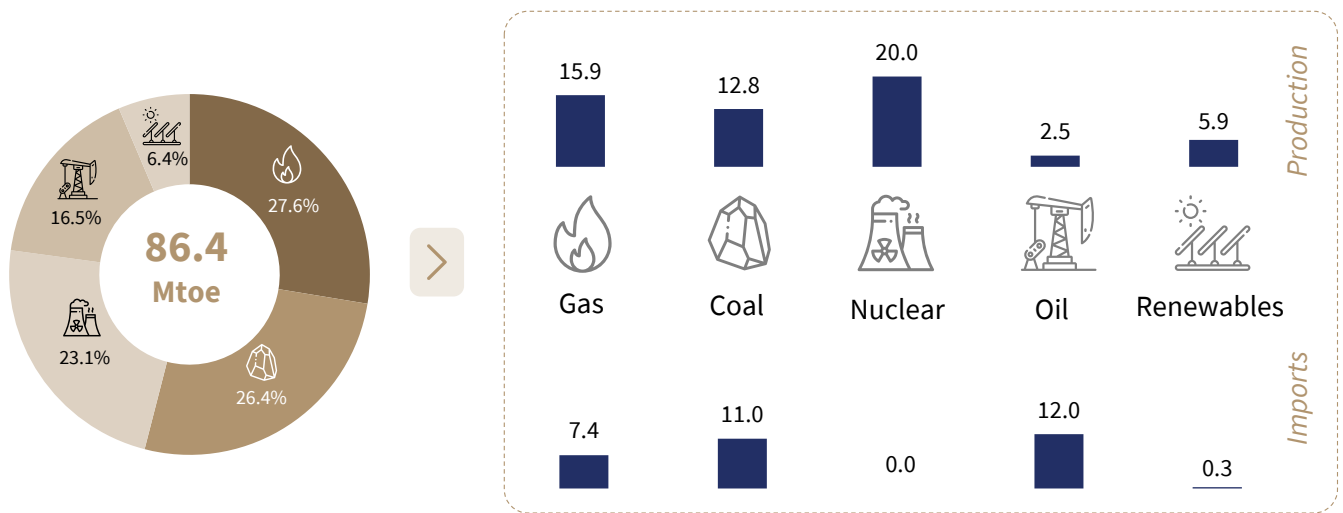
Metallurgy is a large industrial complex. It requires the knowledge of engineering and technical personnel in many branches. It is therefore very promising and in demand to be educated and to work in all professional fields in the metallurgical sector, especially at the end of the war.

BEFORE THE WAR, UKRAINE RELIED ON ENERGY IMPORTS, COVERING 34% OF THE ENERGY SECTOR

Until 2014, **Ukraine was self-sufficient in terms of coal and gas production**. It mainly imports natural gas, oil, and petroleum products. In 2014, as a result of the annexation of Crimea and military aggression of Russia in Donbas, **Ukraine was deprived of coal mines in the Donbas region, as well as oil & gas fields on the Black Sea shelf**. These have **deteriorated the stability of the**

energy system and increased its reliance on imported resources. To decrease the dependence on Russian energy resources and bring the system in line with European standards, Ukraine has been reforming the energy sector since 2014. However, the results of the reforms were ambiguous since **Russia remained the main exporter of energy resources to Ukraine**.

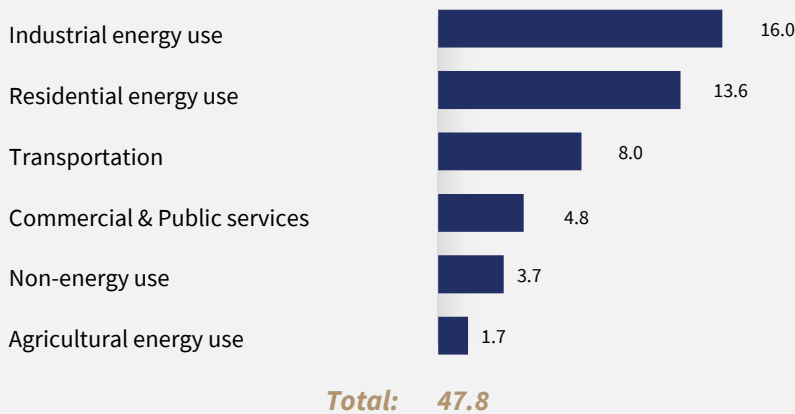
Total primary energy supply (TPES) in Ukraine by energy source in 2020, Mtoe¹



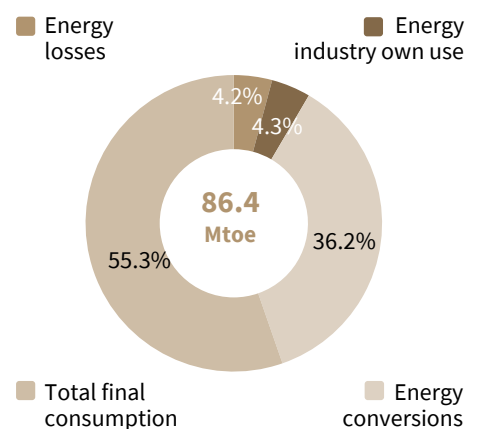
In 2020, the Ukrainian **energy mix was relatively diversified, with no fuel representing more than 30%** of the TPES. Energy demand surpasses domestic supply, which **covered only 66% of national consumption** in 2020. The remaining energy gap was covered by imports, mostly from Russia and Belarus. Ukraine heavily relied on the import of oil products since none of them was

produced locally in 2020. Even though the export of some energy sources, such as electricity and biofuels, exceeded imports in 2020, the **total export of energy remained low** at 1.3 Mtoe. Hungary and Poland were the major importers of Ukrainian energy. In 2020, the **largest final energy consumer was the industrial sector**, followed by the residential sector and transportation.

Total final consumption (TFC) of energy, Mtoe



Energy consumption in Ukraine in 2020



SINCE 2015, UKRAINE HAS TAKEN ESSENTIAL STEPS IN THE LIBERALISATION OF THE GAS MARKET

Ukrainian natural gas market indicators in 2021



~20 bcm¹

production



~3 bcm

imports



42 bcm

transit



14 bcm

pumped into UGS²

In 2021, Ukraine was the **fourth-largest producer of gas** in Europe. The country has **one of the largest gas transit infrastructures** in the world, with the **second-largest storage capacity** in Europe.



38,600 km

of gas transmission and distribution pipelines



72 compressor stations

with a total capacity of 5,443 MW³



13 UGS

with an annual storage capacity of 30.9 bcm



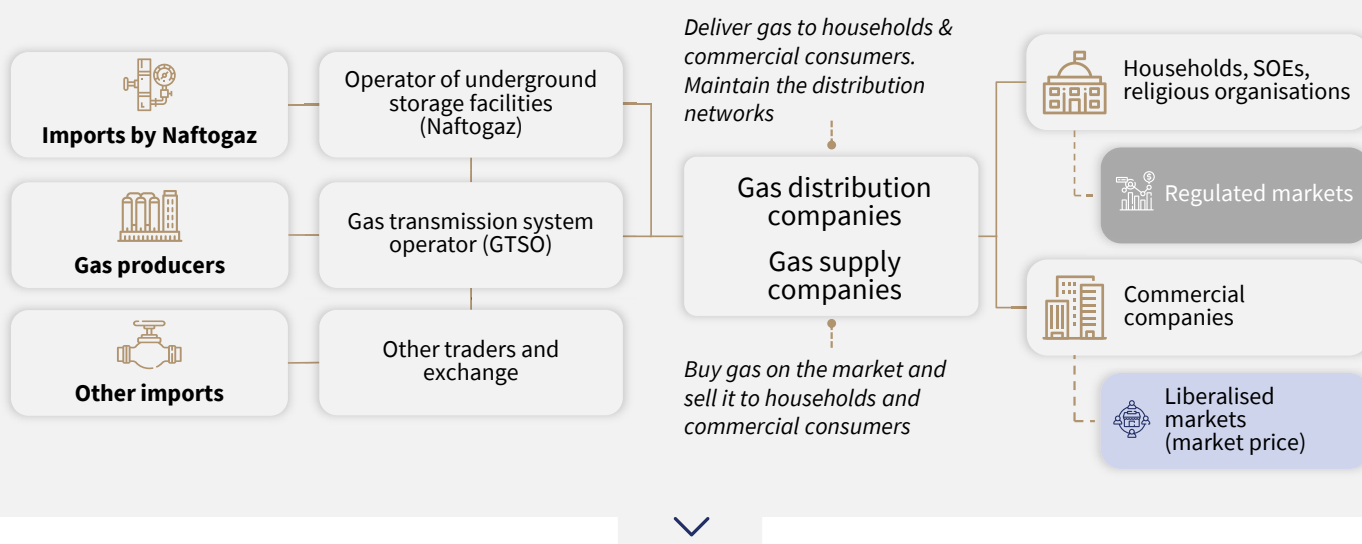
143 bcm

annual capacity of the gas transit system

In 2015, the **Natural Gas Market Law was passed** with the objective of matching the Ukrainian gas sector with the EU doctrines. The law set the regulatory basis for the unbundling of gas storage facilities, LNG terminals, and distribution system operators. **It created access to gas transmission, distribution, and supply networks for the private sector**, allowing companies to sell gas to any consumer, including households. In 2019, the Ukrainian gas market switched from monthly to daily balancing, and an online information exchange platform was launched by the

Gas Transmission System Operator of Ukraine (GTSOU) to increase transparency. That year, there were already 347 private companies operating in the wholesale gas market, 408 companies in transmission activities, and 449 companies in gas storage. After five years of constant reforms, the **unbundling of the gas sector was completed in January 2020**. **In line with EU market principles**, the state-owned enterprise (SOE) Ukrtransgaz became the gas storage facilities operator, and a new SOE GTSOU has been engaged in natural gas transmission since then.

Ukrainian natural gas market after liberalisation



Positive implications of the unbundling of the gas sector for Ukraine

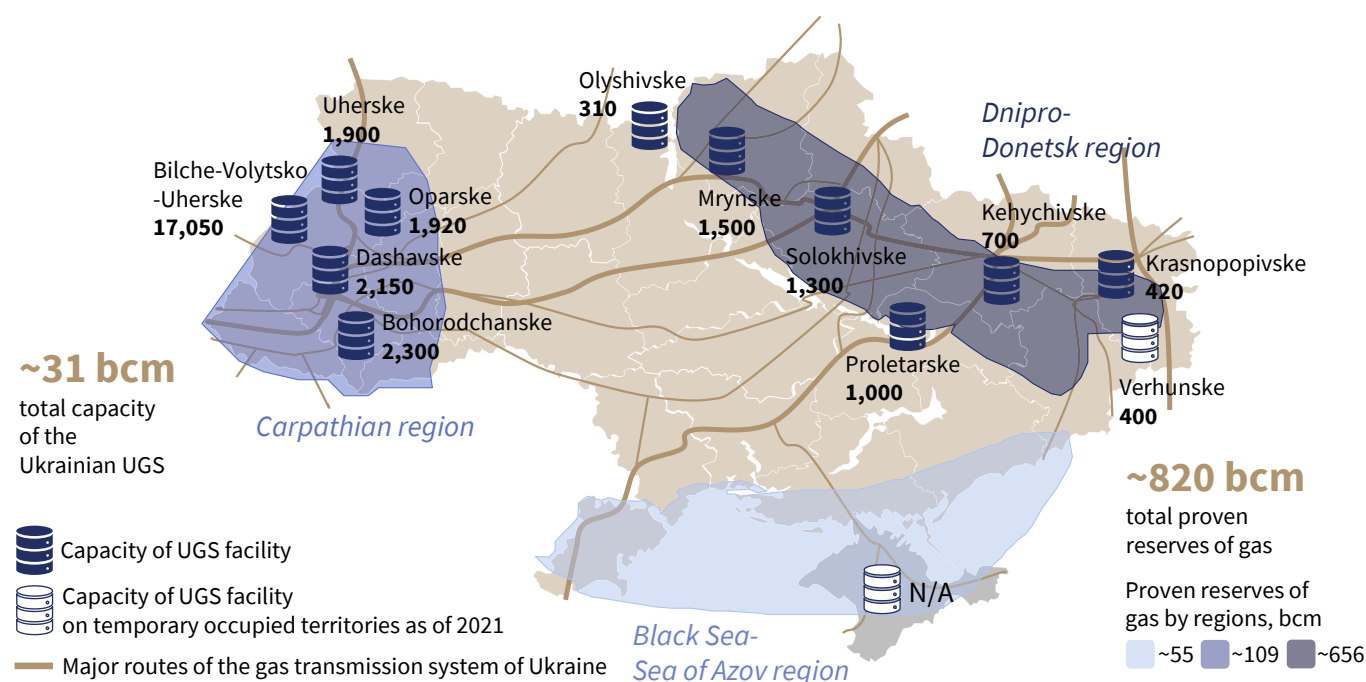
- 1 **Prevention of corrupt schemes & profiting opportunities of officials**
- 2 **More digitalised operations of gas transportation**
- 3 **Harmonisation of the Ukrainian gas sector with EU principles**
- 4 **New market opportunities for smaller players and investors**

EU COULD CREATE STRATEGIC GAS RESERVES USING THE LARGEST UKRAINIAN GAS STORAGE FACILITIES

Ukraine has considerable **natural gas reserves**. The **potential reserves are estimated at 5.4 trillion cubic metres (TCM)** as of 2021, with **proven reserves of 820 bcm of natural gas**. Hydrocarbon resources are concentrated in three areas: in the east, west, and south of the country. The **Dnipro-Donetsk region in the east is the largest one, accounting for 80% of proven reserves** and about 90% of gas production in Ukraine. The Western Carpathian region possesses 13% of proven reserves and 6% of production. The remaining share of proven reserves is in the Black-Azov Sea region in the south of Ukraine.

While Ukraine has been trying to extract more of its own natural gas for decades, energy independence has yet to be achieved. The **exhaustion of most of the active deposits and the Russian military aggression since 2014 became major obstacles**. Nevertheless, the exploration work of new deposits continued. In December 2021, the state-owned enterprise of Ukrgezvydobuvannya announced the **discovery of a new gas field near the Kharkiv region** in Eastern Ukraine. The new Mospanivske gas field has estimated resources of up to 5 billion cubic meters (bcm) of natural gas.

Oil & gas-bearing regions and UGS¹ facilities in Ukraine as of 2021, bcm



In 2021, the Ukrainian natural gas transportation network included **13 underground storage facilities**, of which 12 were operated by Ukrtransgaz – the state-owned Storage System Operator of Ukraine. The country held the **second-largest storage capacity in Europe and Eurasia**, behind Russia. Most of the UGS (80% of the gas storage capacity) is concentrated on the western border of Ukraine. **The underground gas storage is profitable for both foreign traders and Ukrainian companies**

who work with cross-border transportation and gas storage due to **the proximity of the UGS to Europe and the convenience of logistics processes**. The services of the Ukrainian UGS were used by **more than 100 foreign companies from 27 different countries**. In 2021, in addition to Europe and America, the client portfolio included companies from Asian countries for the first time, such as Hong Kong and Singapore.

Key figures of the Ukrainian UGS



~31 bcm

total capacity of the Ukrainian UGS



60%

share of total capacity used on average for domestic consumers, leaving 40% for foreign companies



10 bcm

gas injected into Ukrainian UGS by foreign companies in 2020 (4 times higher vs 2019)



21%

share of Ukraine in the European UGS capacity

THE BLACK-AZOV SEA OIL & GAS REGION HAS A LOT OF POTENTIAL AS PER GEOLOGISTS' ESTIMATES

The Black Sea covers an area of approximately 423,000 km², with a maximum water depth of 2,245 m. **There are many oil & gas fields** around the borders of the Black Sea. Whereas most of the oil & gas deposits are located onshore, as well as in shallow-

marine areas, **very few wells are drilled in its deep-water sector**. The exploration of petroleum in the Black Sea is still in its infancy stage. Nevertheless, **petroleum geologists point toward the considerable potential of the region**.

Black Sea Exclusive Economic Zones (EEZ) as of 2021

Proven and estimated natural gas resources within the **Ukrainian EEZ** are **46 bcm** and **1,169 bcm, respectively**. However, the exact volume is difficult to determine due to the territories claimed by Russia.

It is difficult to determine the potential of the **Russian EEZ** since it claimed a large area of offshore oil & gas acreage after the annexation of Crimea in 2014.

Romania is one of the most advanced littoral countries in terms of developing resources, holding between **150 to 200 bcm** of the offshore natural gas reserves in the **Romanian EEZ**.

Total **Georgia's** natural gas resources are estimated at **266 bcm**, although the share of Black Sea EEZ has yet to be determined.

While there is little known about **Bulgaria's** total natural gas reserves, one of its fields, Khan Asparuh, is estimated to contain **100 bcm**.



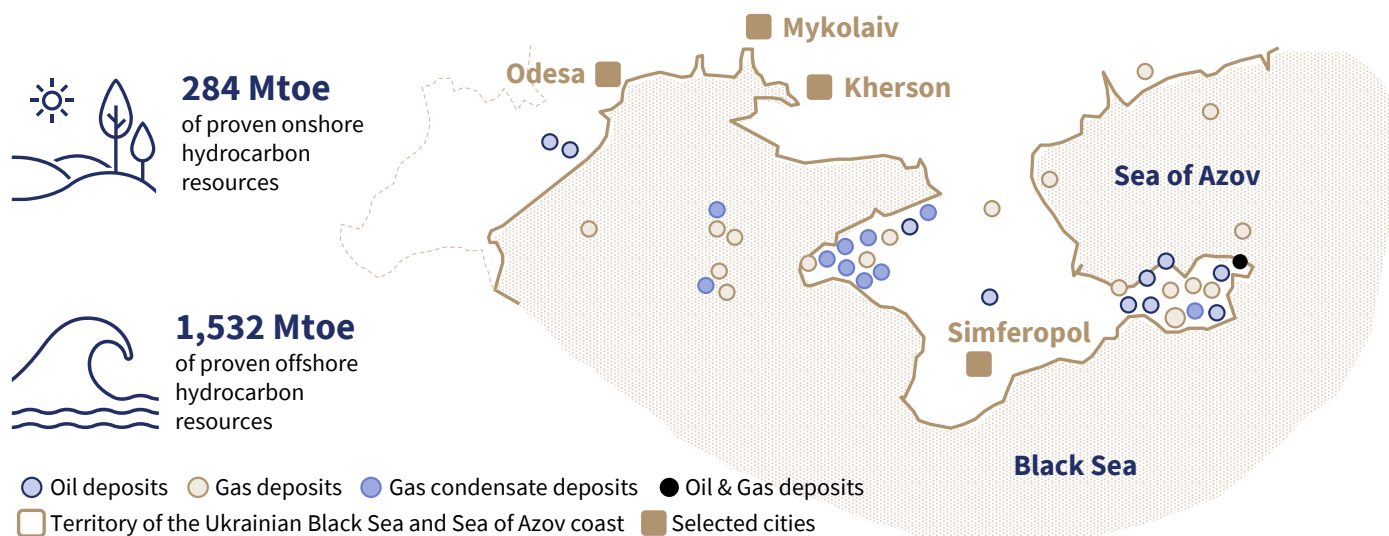
In 2021, Türkiye discovered 135 bcm of additional natural gas in the Black Sea, raising the total potential of the **Turkish EEZ** to **540 bcm**.

- Black Sea & Sea of Azov area
- Crimean territorial sea and EEZ claimed by Russia since 2014
- Borders between EEZ

The Black-Azov Sea oil & gas region of Ukraine is currently at the early stage of the study, and the degree of development of the initial reserves is only 3.5%. In 2014, there were 39 oil & gas deposits in the region, with total proven **hydrocarbon resources of 1,816 million tonnes of oil equivalent (Mtoe)**. The offshore hydrocarbon resources accounted for 84%. While total natural gas resources of the region were estimated at 1.3 trillion cubic meters

(TCM), potentially, the **Ukrainian Black-Azov Sea region may contain more than 2 TCM of natural gas**. Estimated and proven reserves of the hydrocarbons of the Ukrainian Black Sea region indicate that the area has a powerful oil & gas potential. **When Russia seized Crimea in 2014, Ukraine had lost control of almost 80% of its oil & gas deposits** in the Black-Azov Sea region, as well as a significant part of the port infrastructure.

Location of oil & gas deposits within the Ukrainian Black-Azov Sea region as of 2014



SINCE THE START OF THE WAR, UKRAINE HAS LOST SIGNIFICANT PART OF ITS ENERGY INFRASTRUCTURE

Russia's war against Ukraine had a significant negative impact on the energy system of Ukraine. In the regions where hostilities took place, energy infrastructure has been either severely damaged or completely destroyed. In addition, temporary occupation and disruptions in the operations of the Zaporizhzhia NPP¹ and several TPPs² in the Donbas region further undermined

the energy capabilities of Ukraine, increasing the risk of crisis in the next heating season. In order to prevent this, Ukraine has to increase imports of energy resources (coal, in particular). However, due to the blockade of Ukrainian seaports, the country is now unable to transport energy resources by sea and is forced to look for alternative transport routes.

Impact of Russia's war against Ukraine on the energy sector of Ukraine



2 Bn USD

estimated damage to the Ukrainian energy system³



460 Mn USD

estimated damage to the Ukrainian power grid⁴



5,000 km

length of destroyed gas pipes⁵



-43% in NNP capacity

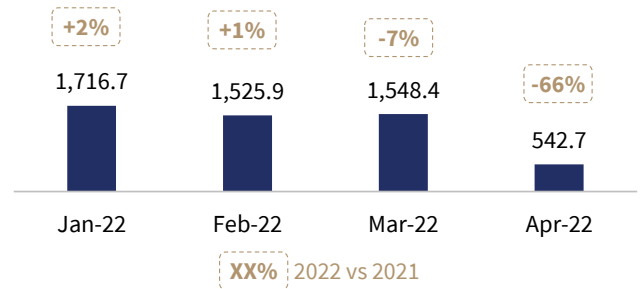
due to the loss of Zaporizhzhia NPP, the largest in Europe

Impact of Russia's war against Ukraine on selected energy sources

Ukrainian **natural gas output** dropped after the beginning of the Russian invasion, with **production being stopped or reduced** at some fields due to worsening safety conditions. Additionally, several gas storage facilities were damaged, including the **Mrynske and Krasnopopivske storage sites, which stopped** their operations due to the hostilities. The **Olyshivske gas storage facility was shelled** by the Russian army in mid-March. In April 2022, gas **storage levels were 40% below** the levels of 2021.

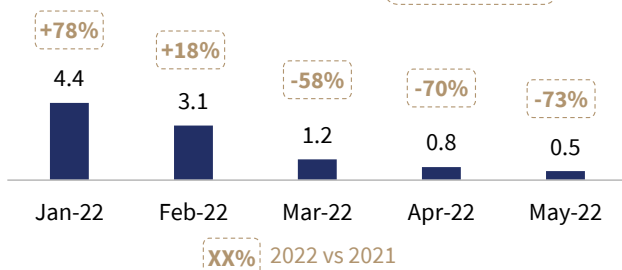
Volume of natural gas produced in 2022, million m³

-18%
Jan - Apr
2022 vs 2021



Volume of electricity sold in 2022, million MWh

-20%
Jan - May
2022 vs 2021

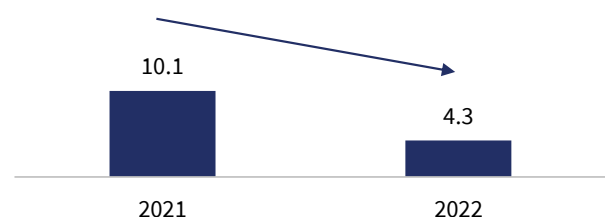


Consumption of electricity in Jan - Apr 2022 **decreased by 30%** compared to 2021 due to **disruptions of the power grid** and the migration of the Ukrainian population from the areas of active military actions. Since the start of the war, over **2.5 million households have lost access to electricity**. As of June 2022, **737 settlements with 647.3 thousand households remained disconnected from the power grid**. Moreover, Russian forces have shelled several large power plants since the beginning of the invasion, leaving Ukrainians without electricity and water supply in some territories.⁶

In the first half of 2022, the **import of coal** dropped almost by **50%** year over year. Despite the war, **41% of import value came from Russia**. Production of coal in Jan - Apr 2022 decreased by 30% compared to 2021, as Ukraine has **lost 10 coal mines** on the currently occupied territories and **20 coal mines** on the controlled territory by Ukraine. To survive the next heating season, Ukraine would **need to increase its coal inventory to at least 2 million tonnes**.

Import of coal in Jan - Jun to Ukraine, million tonnes

-42%
Jan - Jun
2022 vs 2021



THE EU HAS PLEDGED TO DRASTICALLY REDUCE THE IMPORT OF RUSSIAN FOSSIL FUELS DUE TO THE WAR

Since the beginning of Russia's war against Ukraine, the global energy market has endured many disruptions, including an **increase in the price of energy resources and obstruction of logistical chains**. Prices of coal, oil, and natural gas reached their historic maximums under the risk of disruptions related to the war. The European energy market has suffered the most from the

war since **Russia was the biggest exporter of energy resources to Europe** in 2021. In response to the Russian aggression, **the EU has pledged to ban seaborne imports** of Russian crude oil by the end of 2022 and **to stop the import of Russian fossil fuels by 2030**.

Changes in the European (EU-27) energy import from Russia in March - June 2022¹



-22.3%

in oil products imports



-27.6%

in crude oil imports



-31.2%

in LNG² imports



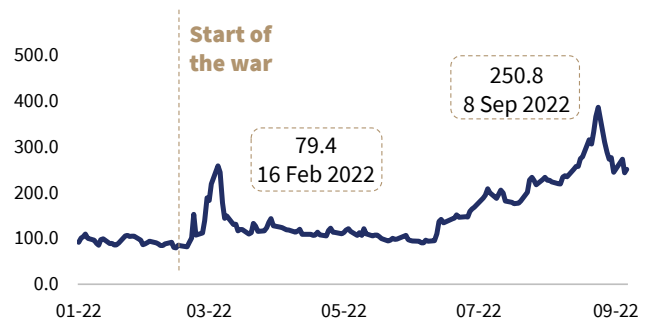
-2.1%

in gas imports³

Impact of Russia's war against Ukraine on selected energy sources

Responding to the war, **the EU, which was a major importer of Russian gas in 2021**, pledged to **cut the import by two-thirds before the end of 2022** and **completely stop** imports of Russian fossil fuels **by 2030**. Thus, in June 2022, for the first time in history, Europe imported more LNG from the USA than via the pipeline from Russia. Meanwhile, **Russia continues to blackmail the EU by stopping Nord Stream 1**, which pumps a third of Russian gas to Europe, until sanctions against Russia over its invasion of Ukraine are lifted.

Dutch TTF natural gas future price, USD



Brent oil future price, USD



Given the rise in natural gas prices in the second half of 2021, **the demand for coal was soaring**. The Russian invasion of Ukraine **only intensified the demand** for coal, making its **price increase rapidly**. In April 2022, the EU agreed on the fifth package of sanctions against Russia, which included an **import ban on Russian coal**. The EU embargo on Russian coal came into force in August 2022. It is estimated to create **over 9 Bn USD in loss of revenue per year** for Russia.

Before the war, **Russia was the biggest exporter of oil to the EU**, with almost a **25% share in European oil imports**, the equivalent of 430 Bn USD a year. In response to the Russian aggression against Ukraine, the **EU imposed a partial embargo on Russian crude oil and petroleum products** in June 2022. The EU **pledged to ban seaborne imports** of Russian crude oil as of December 2022 and ban petroleum product imports as of February 2023. However, **pipeline imports of crude oil and petroleum products from Russia will be exempt** in a compromise with some of the EU member states.

Rotterdam coal future price, USD





Ukraine has sufficient resource potential to increase domestic natural gas production



Ukraine's potential to increase its domestic natural gas production is more than enough. It can achieve energy independence and start exporting to EU countries.

Surely, it is impossible to realise the available resource potential in the conditions of active hostilities and captured territories, but soon after the victory, this should transform into a critical goal. We understand, and the war outlined it even more, that Ukraine can no longer depend on imported gas. This is a question of national security, not only of energy.

ANDRII ZHUPANYYN

Member of Parliament of Ukraine

Involvement during Russia's war against Ukraine: Andrii is actively engaged in volunteer activities, organising humanitarian hubs to help refugees. He was a member of the Ukrainian delegation to Washington, following which a number of historical decisions were endorsed: the lend-lease, the proposition to transfer money from frozen Russian assets to help Ukraine, as well as allocation of the 33 Bn USD package to Ukraine.

What is the future of the natural gas industry, and the energy sector in Ukraine? What changes in the energy sector will be accelerated by the war?

Ukraine's potential to increase its domestic natural gas production is more than enough. It can achieve energy independence and start exporting to EU countries. We have already exported gas to Europe, as in the mid-1970s Ukraine produced 68 bcm, and will definitely be able to do it in future.

The regions in the east and west of the country, as well as the Black Sea shelf, are promising for development. More than 700 bcm of natural gas are available for production, and trillions of cubic meters are potential resources. The State Geological Survey of Ukraine emphasises that the Black Sea shelf has nearly 2.3 bcm tonnes of conventional fuel, which is equivalent to 2.3 trillion cm and makes up about 40% of all energy reserves of our country.

In post-war Ukraine, how will the landscape of the heavy industries change, given the changes in the energy sector?

Since the beginning of the war, many large industrial consumers have been damaged or destroyed. Given the extent of damage, having been caused to some of them, we should not expect any quick recovery of demand for natural gas from the heavy industry. Consequently, natural gas consumption decreased by approximately 50%. Demand reduction was also observed in production of electricity, as Azovstal was destroyed and other facilities have greatly reduced their production capacities. In metallurgy, the war caused a 75% drop in output, compared to its pre-war volumes.

Heavy industry is forecasted to revive mainly in the west of Ukraine. This, however, is a very long-lasting process. Considering the high cost of energy, new facilities will, first of all, focus on improvement of their energy efficiency and reduction of waste.

DID YOU KNOW THAT IN 1909 OIL PRODUCTION IN BORYSLAV ACCOUNTED FOR 5% OF THE GLOBAL?

1909

More than 1,920,000 tonnes of oil were produced in Boryslav — about 5% of the world's oil production, that made the region the third biggest producer of oil globally after the USA and the Russian Empire.

In the foothills of the Carpathian Mountains, **Boryslav** has been a **large industrial center** for centuries. The area became a major oil producer since the XIXth century in Europe. The eastern oil and gas region began to develop actively only in the 1950s, and until that time the western part of Ukraine was the center of oil production.









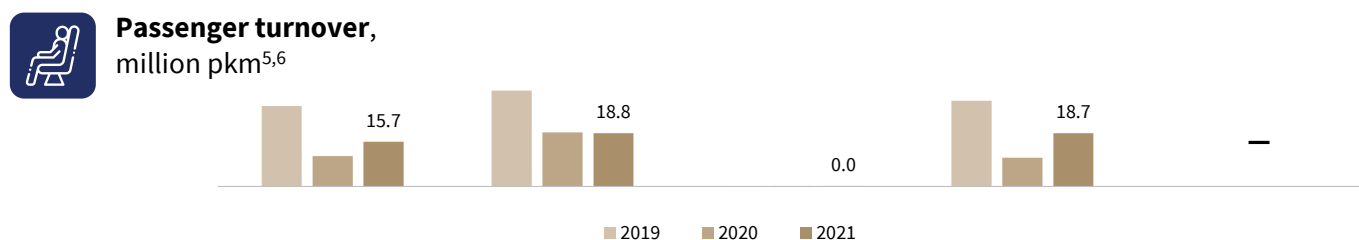
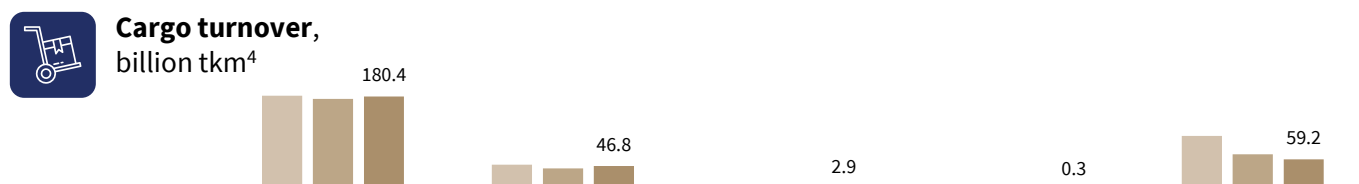
THE PRE-WAR TRANSPORT SECTOR OF UKRAINE WAS UNDERGOING A COMPLETE TRANSFORMATION

Since its independence, Ukraine has built an **extensive transport infrastructure**, from multiple **seaports and river terminals** to developed **land and air transport networks**. These networks have enabled **efficient transportation** for mining and agriculture, oil & gas, food & beverages, and many other product categories, both within the country and abroad. Before the war, the sector's development was determined by a strategic plan called '**Drive Ukraine 2030**', jointly developed by the Ukrainian Ministry of Infrastructure and the top industry experts of the EU in 2018. **With an aim at the improvement and modernisation of**

the Ukrainian transport infrastructure, the document contained the best practices, along with technological advancements (digitisation, introduction of driverless cars, and construction of smart roads). The **ultimate goal** was the eventual **integration of Ukrainian and European infrastructure networks**, intended to enable further economic growth. The total budget of the plan was **60 Bn USD by 2030, creating 600,000 additional jobs**. Some projects have already been initiated. For example, **5,000 km of roads were constructed in 2021**, along with major airport renovation projects in **Uzhhorod and Kherson**.

Snapshot by transportation type in 2021¹

	 Railway transport	 Road transport	 Water transport²	 Air transport	 Oil pipeline
 Infrastructure					
Selected assets	20,000 km of railways, 45% of which were electrified	170,000 km of roads of state and regional importance	13 operating ³ seaports, 16 river ports across 3 rivers	20 airports, 258 aeroplanes in the park, serviced by 45 operators	5,000 km of pipelines
Selected strategic targets by 2030	Full upgrade of the fleet with high-speed trains	+10 highways, max time to cross the country: 10 hrs	Service 30% of all cargo volume in the Black Sea	A total of 50 airports, travellers make up 50% of the population	—



OPINION CORNER

Yuliia Shnepa

Talks about Infrastructure, Financing, Reconstruction, and Investment



The war has brought about severe infrastructure damages: railways, airports, roads, bridges, and other objects shall require either an overhaul or 'building from scratch.' This is a good opportunity for **European subcontractors to get involved in upcoming projects with the support of international financial institutions**, for example, the **International Bank for Reconstruction and Development** and the **European Investment Bank**.

Source: Transport Strategy Centre — Transport Book — [2021]; State Statistics Service website; State Aviation Administration website; The Ministry of Infrastructure website

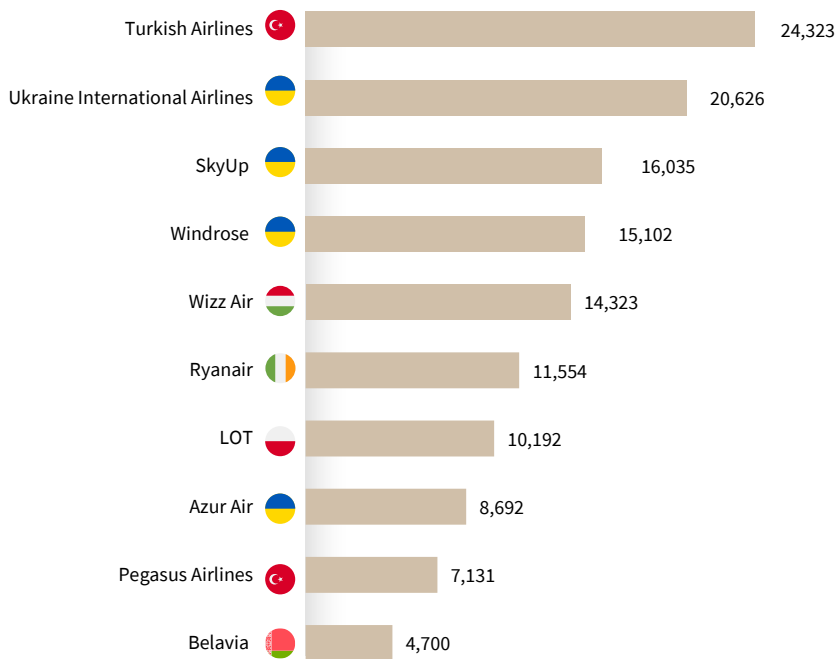
Notes: (1) Excluding urban transport; (2) Including both sea and river transport; (3) Not including five seaports on the temporarily occupied territory (4) Tonne-km; (5) Passenger-km; (6) Excluding urban transport. The figure for road transport includes buses only

AIR TRANSPORTATION IN UKRAINE WAS PRESENTED BY BOTH DOMESTIC AND INTERNATIONAL AIRLINES

There is a large development opportunity for the air transportation sector of Ukraine, given the size and population of the country. The rapid growth of passenger transportation at Ukrainian airports was after 2015, growing from 10.7 million passengers to 24.3 million in 2019. The spread of the COVID-19 pandemic caused a sharp decline in air transportation

services. However, the sector demonstrated a fast recovery, growing by almost 50% in 2021 compared to the previous year. **10 Ukrainian airlines operated regular international flights to 42 countries, while 28 foreign airlines had flights from Ukraine to 27 countries worldwide.** 5 Ukrainian airlines operated domestic flights to 9 cities inside the country.

Major players in the air transportation sector of Ukraine, by number of flights, in 2021



In 2021, domestic passenger traffic in Ukraine amounted to 1.5 million passengers, a 41% increase compared to 2020. Meanwhile, the international passenger traffic from Ukrainian airports demonstrated significant growth of 93% to 14.7 million passengers. According to the annual performance, Ukraine was among the five European countries with the smallest drop in air traffic compared to pre-pandemic 2019.

20 airports in the territory of Ukraine served passengers in 2021

16.2 million passengers were the total passenger traffic of Ukrainian airports in 2021

91% of flights from Ukrainian airports made by airlines in 2021 were international

The largest airports in Ukraine, by passenger traffic, in 2021

Approximately **98% of passenger traffic** was concentrated at the **7 major airports in Ukraine**. In 2021, the total passenger traffic of Ukrainian airports increased by 87% compared to 2020.



THE WAR CAUSED MULTIBILLION DAMAGES TO THE UKRAINIAN TRANSPORT AND LOGISTICS SECTOR

The full-scale Russian war in Ukraine has **direct and indirect impacts on the transport and logistics sector** of the country. Since the beginning of the invasion on 24 February, the Russian army has been **hitting the critical infrastructure of Ukraine** to halt economic activities, especially the trading flows.

In addition to **the high cost of physically destroyed Ukrainian infrastructural assets**, such as roads, bridges, airports, and railways, Ukraine has also suffered **huge economic losses from the disruption of business operations and the closure of various production facilities**, which has led to a significant decrease in demand for transport services and an increase in transportation tariffs.



Fuel shortage and price increase

The destruction of oil depots, as well as the Kremenchuk oil refinery and the naval blockade of ports, have led to an acute shortage of petroleum products and a hike in prices in the Ukrainian fuel market. As of July 2022, gas prices increased by almost 107%, while fuel prices rose by 43% compared to 23 February 2022. However, in July-September 2022, Ukraine managed to rebuild its fuel market, which allowed it to increase the resilience and flexibility of supplies. More than 50% of the fuel is now transported by fuel trucks, avoiding the concentration of large amounts of fuel on transport knots, which are under the threat of shelling by Russia.

Estimated damages to the Ukrainian transport & logistics infrastructure¹

Item	Details	Damages, Bn USD
Roads	24.8 thousand km	26.3
Railway stations and rolling stock	6.3 thousand railways, 41 bridges	2.7
Civilian airports	19 units	2.0
Bridges and bridge crossings	311 units	1.7
Cars	188.1 thousand units	1.7
Ports and port infrastructure	4 units	0.5
Military airfields	12 units	0.5
An-225 Mriya aircraft	1 unit	0.3
Storage infrastructure	198 units	0.3
Oil depots	28 units	0.2
Estimated total:		36.2 Bn USD



Most of the **Ukrainian seaports** had been under a complete Russian **blockade** until 22 July 2022, when the Black Sea Grain Initiative was set.² The initiative enabled the export of grain and foodstuffs from Ukraine. However, the export of other goods is still impossible.³ The blockade is causing **daily economic losses for Ukraine in the amount of 170 Mn USD**.



In 2021, **Ukrainian air transport** started to recover from COVID-19, as the number of flight passengers increased to over **16 million people**, which was 87% more than in 2020. Shortly after the Russian invasion on 24 February 2022, Ukraine closed its airspace to **all civilian flights** because of the high safety risk.



Ukrainian Railway Company became crucial to the country's trade and defence during the war. Since 24 February, it has **transported about 160 thousand tonnes of aid and evacuated almost 4 million people⁴**. Railway employees are paying a high price for their work: 177 have been killed, and 257 were wounded during the war.

DID YOU KNOW THAT THE LARGEST AIRPLANE WAS
CONSTRUCTED IN UKRAINE?

Antonov An-225 'Mriya',

the **largest and the heaviest airplane** ever, was
constructed in only one instance in **Ukraine** in 1988.

88.4 meters

Wingspan



18.1 meters

Height

640,000 kg

Weight

In **February 2022**, Antonov An-225 'Mriya' **was destroyed by Russian forces** in Hostomel (the Kyiv region) during the Russian invasion of Ukraine.

TRANSPORT ROUTES HAVE CHANGED DUE TO THE DISRUPTION OF THE TRANSPORT SYSTEM

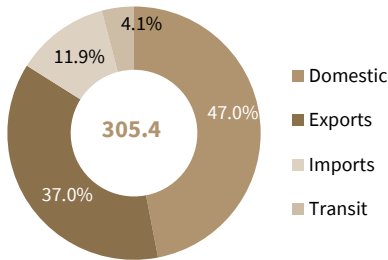
Before the war, Ukraine was an **important transit corridor** for trade between **Europe, Asia, and the Middle East**, having 19 FTAs¹ with 46 countries. The established transport routes were well-developed and enabled high standards for product delivery.

The **railway transport capacity was mostly used for domestic delivery** and transit, which accounted for 84% of the total cargo volume in 2020. In contrast, **water transport was mostly used for the export of goods**, including iron ore, coal, and grain.

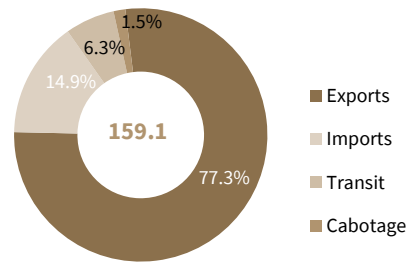
Cargo transportation in Ukraine in 2020, million tonnes



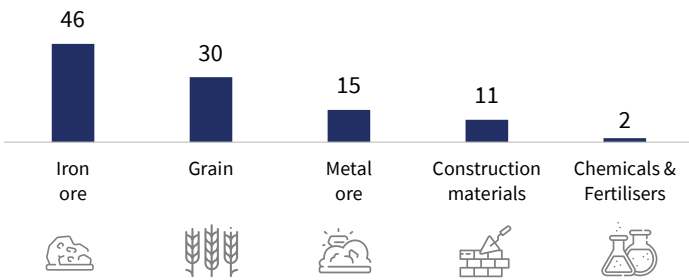
By railway transport



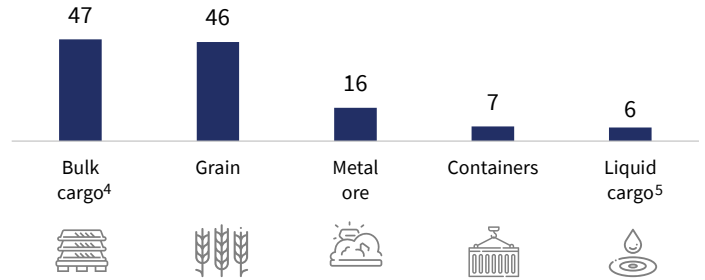
By water transport



Top-5 categories: 104 million tonnes²



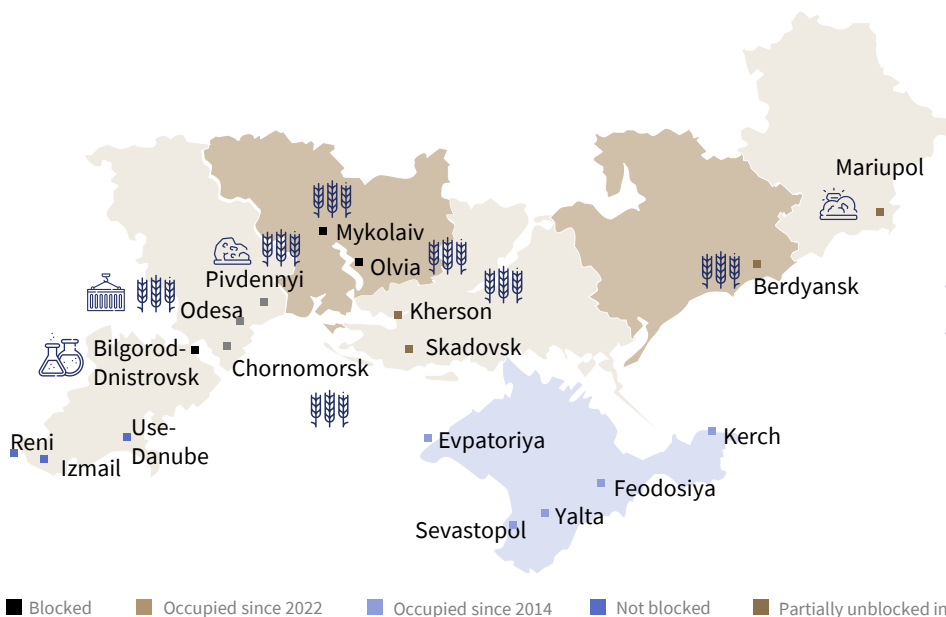
Top-5 categories: 122 million tonnes³



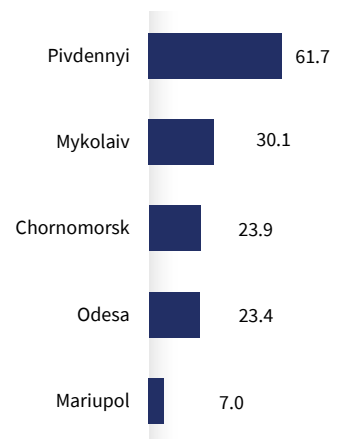
The significant disruption of the transport system of Ukraine has led to rapid changes in transport routes. The **freight traffic shifted to railways and roads as Russia blocked most of the Ukrainian seaports**. Three ports on the Danube river provide only

a tenth of the pre-war transshipment capacity. The ports unblocked within the **Black Sea Grain Initiative** serve only the export of grain and foodstuffs, while the export of other products by seaports (such as iron or metal ore) is temporarily impossible.⁶

Ukrainian seaports before and during Russia's war against Ukraine



Top-5 Ukrainian ports by cargo volume in 2020, million tonnes



THE WAR HAS SEVERE CONSEQUENCES FOR THE TRANSPORT & LOGISTICS SECTOR GLOBALLY

In addition to immediate upheavals in the transport systems of Ukraine and the neighbouring countries, the Russian invasion has caused **major disruptions to the global supply chains**, both in terms of the **security of logistics routes** and the **availability of commodities**. When the global supply chains just started to recover from the impact of COVID-19, global trade was hit with

another wave of new challenges. Hostilities, infrastructure damages, trade restrictions, and global sanctions on doing business with Russia have **led to a growing number of delays of goods, rising fuel prices, and freight costs**. As a result, international companies are now **forced to recalibrate their long-standing supply chains and partner ecosystems**.

The impact of the war on the global logistics and supply chains



Maritime

Before the war, around 70% of Ukrainian exports were distributed via ships

Ukraine is one of the world's largest exporters of grain, supplying more than 45 million tonnes annually, primarily through Black Sea ports. The blockade of ports placed global food security at threat, especially in emerging countries. Therefore, in July 2022, the UN initiated the creation of maritime corridors to enable the export of grain from Ukraine.

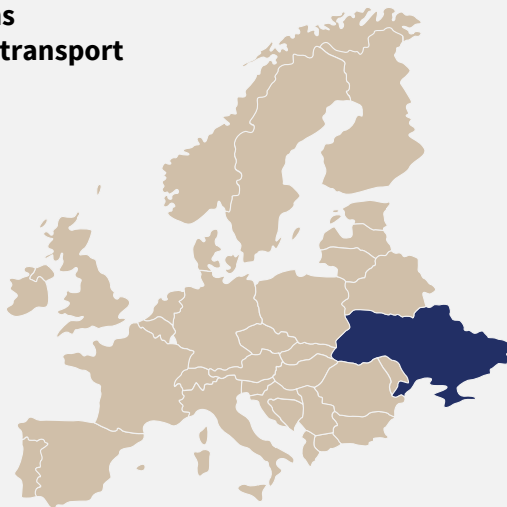


Rail

Rail transit through Ukraine amounted to 2% of westbound container traffic volumes

Russia's war against Ukraine has jeopardised the rail connectivity between China and Europe, as most routes pass through Russia. Although only 2-3% of the total volume was transported via routes in Ukraine, the global sanctions imposed against Russia are forcing cargo owners and logistics operators to look for alternative routes.

EU sanctions concerning transport



- Closure of EU airspace to all Russian aircraft
- Closure of EU ports to Russian vessels
- Ban on Russian road transport operators
- Ban on export to Russia of goods and technology in some sectors¹



Aviation

Flights between Europe and Ukraine accounted for 3.3% of air passenger traffic in 2021

Air transport has been greatly affected by the Russian invasion, as 36 countries have closed their airspace to Russian aircrafts², and Russia responded with a retaliatory move. The imposed sanctions led to the need for rerouting, which significantly increased the cost of flights, as additional fuel and flight time are required.



Road

12,000 truck drivers of different nationalities were stuck in Ukraine at the beginning of the war

The shutdown of other modes of transport has increased the demand for road transport, yet rising fuel prices and driver shortages are causing delays and disruptions in supply chains. Due to limited capacity and high transport costs, there may be shortages of materials and goods in various sectors in Europe and beyond.



We have to build a NEW Ukraine: modern, efficient, green, comfortable



Only in railways we have lost over 23% of the infrastructure. This is supplemented by the destroyed roads, bridges, and airports, as well as blocked, mined and destroyed ports. One should add also the economic losses which were caused by the blocked export of grains, sunflower oil, metal, chemicals, etc., which amounted to 2-3 Bn USD. A rough estimate of losses from the Russian invasion (excluding occupied territories since we cannot calculate there) already exceeds 1 Tn USD.

DR YULIA KLYMENKO

Member of Parliament; First Deputy Head of Transport & Infrastructure Committee at the Verkhovna Rada of Ukraine

Involvement during Russia's war against Ukraine: Yulia takes an active social position and communicates with foreign ambassadors, inter-factional unions, and other representatives to raise awareness on the war in Ukraine.

According to preliminary estimates, the total amount of losses incurred by the Ukrainian transport infrastructure due to the Russian invasion exceeds 40 Bn USD? How much time may Ukraine need for its restoration?

First of all, I would say that infrastructure losses are much higher than 40 Bn USD. Only in railways we have lost over 23% of the infrastructure. This is supplemented by the destroyed roads, bridges, and airports, as well as blocked, mined and destroyed ports. One should add also the economic losses which were caused by the blocked export of grains, sunflower oil, metal, chemicals, etc., which amounted to 2-3 Bn USD. A rough estimate of losses from the Russian invasion (excluding occupied territories since we cannot calculate there) already exceeds 1 Tn USD. But we must start reconstructing our country right now because, on the one hand, we have to defend our land and, on the other hand, rebuild and keep the economy running. And we have to rebuild a NEW Ukraine: modern, efficient, green, comfortable, and competitive globally.

In June 2022, the EU and Ukraine signed the Agreement on the liberalisation of road transportation on the Ukraine-EU routes. What global impact do you expect from such decision?

I believe it will improve and speed up logistics between Ukraine and the EU. This is critically important right now when the Ukrainian economy is completely dependent on sustainable logistics through its western borders. Ukraine feeds 400 million people, mostly in low-income countries. In global consumption, Ukraine exports 58 million tonnes of agricultural commodities annually. 90% of it was shipped through the seaports of Azov and the Black Sea, through a developed infrastructure ecosystem of river- and seaport facilities equipped with storage and export laboratories. Understanding how critical our food supply is for many countries (Egypt depends on Ukraine, as the latter accounts for 80% of its wheat consumption), despite the war, Ukraine has invested to triple its river, railway, and road transportation capacity. Now we can export through our western borders 1.5-2 million tonnes of grain monthly (vs. 0.5 million tonnes before).



SkyUp Airlines is in the process of registration in the European Union



My professional life has changed drastically since 24 February. There is no possibility to fly from our home base in Kyiv or other Ukrainian airports at the moment. Instead, I am flying from different countries under the aegis of the companies SkyUp has wet lease agreements with.

As well as the other crew members I have short- and medium-term business trips to different bases followed by a period of time spent at home. Since SkyUp does not have one permanent base at the moment, all the pilots and cabin crew members should be really flexible and ready to travel a lot, even to change locations during one business trip.

TETIANA KOVKINA

First Officer at SkyUp Airlines

Involvement during Russia's war against Ukraine : *In the conditions of the closure of the Ukrainian airspace, Tetiana continues working, flying across various countries under the aegis of companies that SkyUp has wet lease agreements with. Tetiana contributes to economic stability of Ukraine, showing dedication to work, being really flexible and ready to travel a lot.*

What changes did your company go through to adjust to the new reality? What measures were implemented to retain the pilots and other professionals?

From the very beginning the company's efforts were headed at establishing new contracts and finding new possibilities to continue operations. Finally, the first wet lease flights departed just a few months later. The results of tremendous job can be seen now, as our company's aircrafts fly all around Europe, as well as in Türkiye, Egypt, and other countries.

Despite everything, the company continues to operate and support Ukraine by paying taxes. To make it possible, our pilots and cabin crew were relocated to different countries where aircrafts are based now.

There is one more important project SkyUp is working on, registration of SkyUp Airlines in the European Union.

How did your professional life change after 24 February 2022?

My professional life has changed drastically since 24 February 2022. Today there is no possibility to fly from our home base in Kyiv or other Ukrainian airports. Instead, I fly from other countries under the aegis of the companies that SkyUp has wet lease agreements with. Just like other crew members, I have short- and medium-term business trips to various bases followed by a period of time spent at home.

Since SkyUp does not have one permanent base at the moment, all its pilots and cabin crew members should be really flexible and ready to travel a lot, even to change locations during one business trip. It may look challenging, but that is our way of life now. And I am trying to get used to it.



Logistics is the lifeblood of a country's economy



With the outbreak of war and martial law in Ukraine, everyone felt the importance of the transport sector in ensuring operation of the economy and the life of our state as a whole.

After all, during the first days of warfare, all of our employees got involved in delivering humanitarian aid from Europe to different parts of Ukraine.

SERHIY KLYMCHENKO

Truckdriver

Involvement during Russia's war against Ukraine: Since the early days of the war, Serhiy has been working on a charitable basis, having delivered humanitarian aid to different parts of Ukraine.

How do you assess the role of the transport sector in ensuring the functioning of the Ukrainian economy under wartime conditions?

During the first days of warfare, all of our employees got involved in delivering humanitarian aid from Europe to different parts of Ukraine.

In the beginning, all the trips were made on a charity basis. Eventually, when it became economically onerous, we returned to making commercial shipments so that our economy could begin to wake up and the carriers would have the financial means to deliver the humanitarian aid all Ukrainians needed as quickly as possible. Thus, humanitarian aid and goods were delivered.

Although shipment volumes transported by trucks cannot be compared to those carried by ships, in these difficult times resilient on-land transportation contributes to the overall success of the country.

Transportation is the lifeblood of Ukraine's economy. And only through our joint efforts will we win and become a successful country.

How has the war affected your work? How has the number of trips changed compared to pre-war times?

The war had an extremely negative impact on our work. Because of the need to support our country's economy during wartime, the number of trucks travelling abroad has greatly increased, forming long queues at the borders. However, the number of operated routes has decreased considerably. This has led to a reduction in the number of trips per month, which has affected drivers' monthly payroll.

What impact has the shortage of fuel, and the resulting increase in its price, had on your work?

After the invasion of Ukraine by the Russian Federation, our state faced a shortage of fuel. Fuel is the most important component for logistics, which ensures the vitality of our profession. During the acute phase of the shortage, we had very big problems, as the vast majority of our time was spent not on the road, but in the queues at petrol stations.



The taxi market in Ukraine is absolutely uncontrolled



The available taxi services in Ukraine compete by offering the lowest price only. Calculation of travel fares takes place behind the scenes, without considering the formula of economic feasibility.

This way, everyone compromises on his / her own safety and continues a vicious circle of the wild market. The Ukrainian taxi market should undergo a quality reform or copy the US, Germany, or Israel model, for example.

YURII KRASII

Taxi driver, volunteer

Involvement during Russia's war against Ukraine: Since the beginning of the war, Yurii has been engaged in volunteer activities. From the first days after the de-occupation of Bucha, Irpin, and Hostomel, he was engaged in the renewal of the local infrastructure.

The war has affected every business in Ukraine, forcing them to adapt to new realities. How will the war impact the taxi market in Ukraine?

The purpose of any state is to create comfortable and equal conditions for the coexistence of its citizens with the help of laws and regulations. In this aspect, for many reasons, our state is not ideal, and many activity areas remain unregulated.

In Ukraine, the market of taxi transportation services is an example of a business activity that requires changes. There is a law on passenger transportation by taxi in Ukraine, but it does not work. It does not provide effective control over its enforcement and definitely does not keep up with the scientific and technical progress which swept the industry after the mobile aggregator apps entered the market.

Well-known are the cases of 'Uberisation' of taxi markets — drivers do not pay taxes and, at the same time, they are not socially protected. They are not subject to pensionable service and they have tax benefits neither for fuel nor for the purchase of a new car. At the same time, passengers are not insured against accidents or incompetence of a driver. Nobody controls drivers, as one can get a job through a messenger. Cab services compete by offering the lowest price only. That being said, the calculation of travel fares takes place behind the scenes, without considering the formula of economic feasibility. This way, everyone compromises on his / her own safety and continues a vicious circle of the wild market. The Ukrainian taxi market should undergo a quality reform or copy the US, Germany or Israel model, for example.

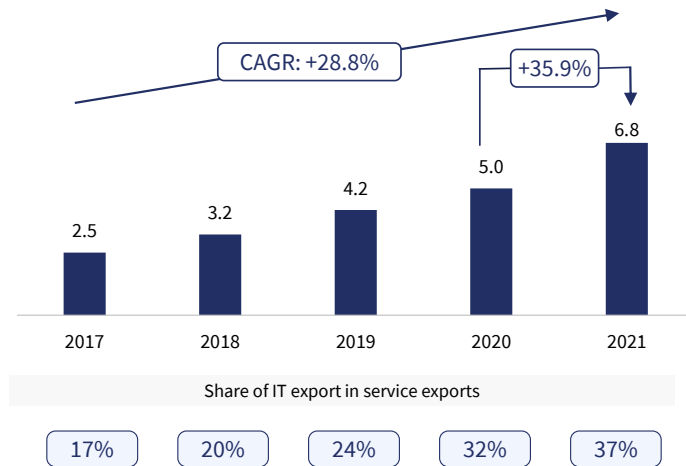
The main idea is not to ban some apps but to create equal rules for all market players. The formula of 'economically reasonable tariff + licensing and taxation of any transporter's activities = responsible service for passengers and decent work conditions for drivers' must start working.

UKRAINIAN IT INDUSTRY HAS SHOWN POSITIVE EXPORT DYNAMICS, GROWING TO 7 BN USD IN 2021

Since 1991, the **Ukrainian IT sector has boosted its development**, thanks to highly professional IT specialists and the growing interest of global tech companies. **Google, Oracle, and Ericsson** were among the key global firms that established **R&D centres in Ukraine**. Despite a relatively small **share in GDP in**

2021 (2.7%), IT services increased their share in service exports to **37%**, with **the USA and the UK being the leading export destinations**. In recent years, the **IT sector generated twice as much export revenue as the gas transmission system or 25% of the agricultural sector's export revenue**.

Export of Ukrainian IT services, Bn USD



As of 2021

- 289 thousand** IT specialists employed in Ukraine
- Over 3,000** tech events were held
- Over 5,000** IT companies operate in Ukraine
- Over 100** R&D centres of global companies
- 832 Mn USD** was invested in Ukrainian start-ups
- 4 unicorns¹** of Ukrainian origin

Grammarly

Value: 13.0 Bn USD²

AI-powered writing assistant that reviews spelling and grammar

Gitlab

Value: 8.5 Bn USD³

App that provides a possibility to develop, secure, and operate software in a single source

People.ai

Value: 1.1 Bn USD⁴

AI-powered revenue intelligence programme

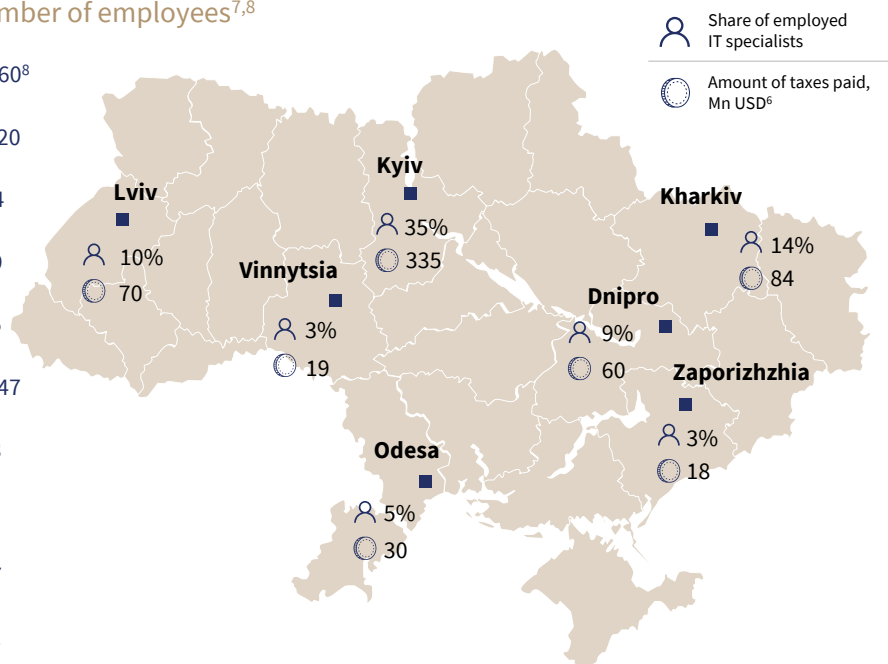
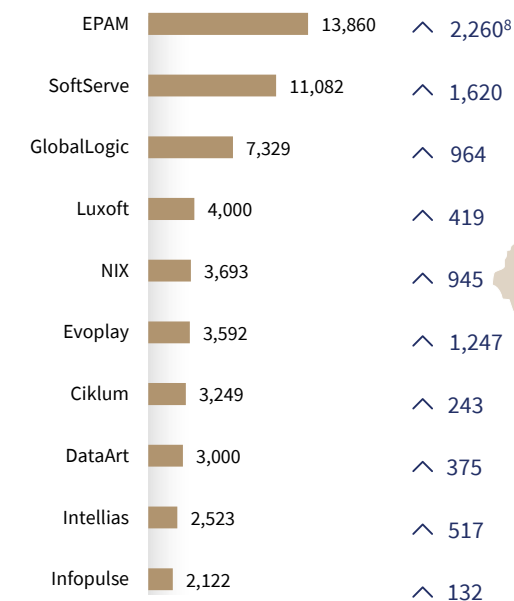
Bitfury

Value: 1.0 Bn USD⁵

Leading full-service blockchain technology company

Development of the IT sector across Ukraine in 2022

Top-10 IT companies in Ukraine, by number of employees^{7,8}



DESPITE THE RUSSIAN INVASION, THE UKRAINIAN IT SECTOR IS RESILIENT AND SUPPORTS THE ECONOMY

During the war, the **Ukrainian IT sector managed to slightly strengthen its position** compared to other industries. In March-May 2022, the IT sector generated **1.7 Bn USD in sales** — 6% higher than in the same period in 2021. Such a positive performance was mainly driven by a successfully implemented remote work scheme, active international contracts, and a general

trend towards opening offices outside Ukraine to hedge the operating risks. On the other hand, since February 2022, **all exporters**, including the IT industry, have been **obliged** to exchange their revenues into **foreign currency** at a **fixed rate**, which is about 10% lower than the **market rate**, hence **lowering the IT industry's profits**.

The impact of Russia's war against Ukraine on the Ukrainian IT sector

Negative



12%

of IT employees want to leave Ukraine, even if it wins the war with Russia¹



20%

of IT employees, from which 64% — women, were forced to relocate abroad¹

Positive



95%

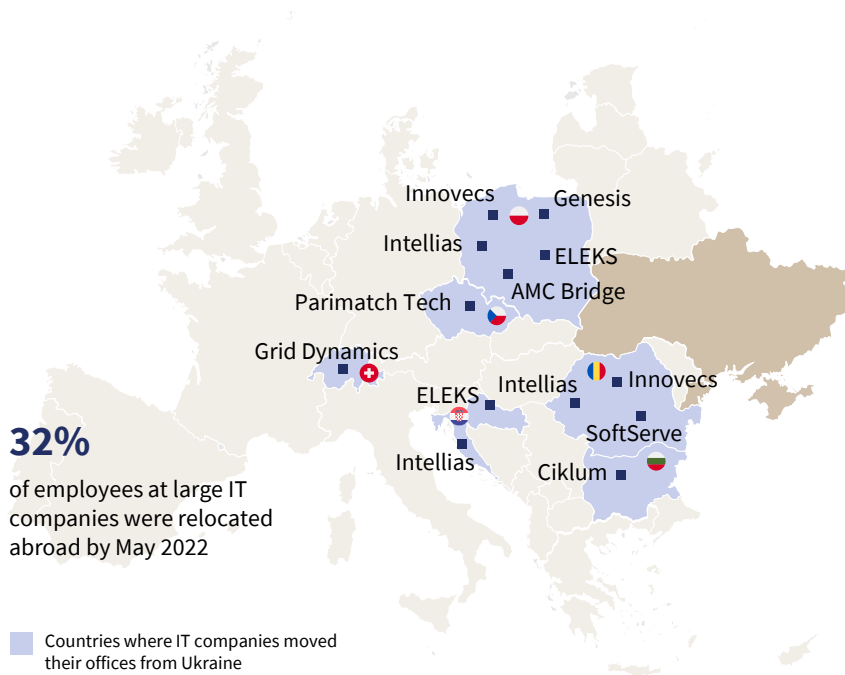
of clients continued their contracts with Ukrainian IT companies



77%

of IT companies in Ukraine acquired new clients and projects

IT companies that opened offices outside Ukraine after 24 February 2022¹



Potential challenges

Although IT companies have successfully moved a part of their employee workforce out of Ukraine and continued operations, it has brought **new challenges to the IT sector, provoking uncertainty** as to the future path and the development of the IT industry in Ukraine, with the following crucial questions:

- **Will every company return** after the war?
- **How intensively** will foreign companies poach Ukrainian IT experts?
- Taking into account the destroyed infrastructure of universities, **will there be enough new IT specialists** to maintain industry growth?



Support of the Ukrainian Armed Forces

Since February 2022, IT companies in Ukraine have been **actively helping** to resist Russian aggression, either by **donating to the Ukrainian Army** and humanitarian funds, such as UNICEF and Red Cross or by **joining the Ukrainian Armed Forces or the Cyber Army**.



9%

of the entire IT headcount joined the Cyber Army of Ukraine¹



3%

of all the IT workforce joined the Ukrainian Armed Forces¹



~21 Mn USD²

was donated by Ukrainian IT companies to charity funds³

AFTER EXITING THE RUSSIAN MARKET, GLOBAL IT COMPANIES ARE EXPERIENCING FINANCIAL LOSSES

At the global level, **Russia's war against Ukraine** has caused some temporary IT **project disruptions**. The major **task of international companies operating in Ukraine** is to **secure their staff** and make sure their project pipelines are moving **smoothly to meet deadlines**. To achieve this, some IT companies have **moved their offices outside Ukraine**, thus securing their most **important asset — people**. As a result, all major **existing contracts remained active**, even despite the war. However, this gave other global IT companies opportunities to **rehire Ukrainian**

IT talents, posing a risk to the future state and development of the IT industry in Ukraine. In addition, Russia's war against Ukraine has also **brought new challenges to the global IT companies that have branches in Ukraine, Russia, and Belarus**, for example, the **growing cybersecurity threats, tech-talent migration**, and **sanctions implemented by the governments**. Global companies had to suspend their activities in Russia under the pressure of **Western sanctions** and probable negative effects on their brand image.

+3%

forecasted growth of global ICT¹ spending in 2022 compared to the +5% pre-war forecast²

10% decline

forecasted in ICT spending of businesses in the CEE³ region during 2022

27% drop

in ICT spending is forecasted in Russia in 2022 if the war lasts beyond 2022

~6 Bn USD

forecasted losses of global IT companies due to the war by the end of 2022

107+

global IT companies have suspended operations from Russia since 24 February 2022⁴

170,000

IT specialists could emigrate from Russia, thus reshaping the global IT talent pool

Selected IT companies' responses to Russia's war against Ukraine

AWS

Stopped **accepting new customers in Russia** for its cloud computing services. AWS did not have any physical assets in Russia.

Microsoft

Stopped **accepting new customers in the Russian market** for all its products and services. The company is expecting to **lay off 400 employees**.

Google

Suspended **all advertising activities** in Russia, including on YouTube. **Losses** are expected to amount to around **1% of Google's total revenue in 2021**.

SAP

Suspended **all new sales to Russia and Belarus**. The company estimates to lose around **325 Mn USD** because of the exiting from these countries.

IBM

Suspended all operations from Russia. The total impact on the company's revenue is expected to be **-300 Mn USD**.

Apple

Suspended **Apple Pay services** and **all product sales in the Russian market**, which accounted for **less than 1%** of Apple's **total revenue** in 2020.

OPINION CORNER

Sergii Gavrylenko

Talks about Digitalisation, Reforms, Virtual Economic Zones, and Incentives



The Ukrainian Government takes measures to facilitate the development of the IT industry. The newly established **virtual economic zone of 'Diia.City'** in Ukraine allows the combining of **effective tax conditions** with other tools, **enabling companies to build a transparent corporate structure**, attract foreign investments more easily, and utilise **additional mechanisms to protect intangible assets**.

Source: IDC — The Impact of the Russia-Ukraine War on the Global ICT Market Landscape — [March 2022]; New York Times website; The Wall Street Journal website; The Economist website; Reuters website; Leave Russia project website

Notes: (1) Information and Communications Technology; (2) In case the war continues by the end of 2022; (3) Central Eastern Europe; (4) As of 12 September 2022



More than 300 companies have become participants of Diia.City



It is too early to talk about the impact of Diia.City on the development of the industry as a whole. War times have adjusted all aspects of public life. For example, investors are now thinking more about the risks of military action and the legal specifics of cooperation. There is the possibility that companies joining Diia.City will be able to book their IT staff and get permission for them to travel abroad on short-term business trips. This is something that Western clients and partners need to be assured that the project development team will remain in place. Accordingly, such guarantees will also have a positive effect on the volume of foreign investment in the IT sector.

VITALY SEDLER

CEO and co-founder, Intellias; President of IT Ukraine Association

Involvement during Russia's war against Ukraine: *The total amount of donations made by Intellias has already exceeded 30 Mn UAH and is still growing. Most of the aid was used for the purchase of drones, and protective equipment for the military, modernisation of the command and analytical centres of the Air Command 'West' of the Air Forces of the Armed Forces of Ukraine, and the purchase of off-road vehicles for the military.*

During the war, the number of IT companies that joined Diia.City increased compared to the pre-war period. How does this affect the IT industry?

More than 300 companies joined Diya City. Many of these companies have indeed joined Diia.City after the full-scale invasion began. In fact, the platform was officially launched only at the beginning of 2022. In the first two months of operation, this service did not have a noticeable impact on the Ukrainian IT sector due to a short operation period.

In general, the development of the IT industry in Ukraine will significantly depend on the implementation of the initiative for the development of specialised education in Ukraine. In this context, we see the grand plans of the Ministry of Digital Transformation and the Ministry of Education, which we support through our daily effort. Diia.City creates flexibility and freedom of choice for its enterprises-participants. Freedom of choice is the key principle that we have always insisted on preserving.

How do you assess readiness of the Ukrainian high-tech industry for war? To what extent has the IT sector been affected?

The sector has demonstrated a high level of viability. 85% of companies managed to completely or almost completely restore business operations. 2/3 of companies report growth, and 1/7 of them record significant growth. The exception constitutes only the companies that worked purely with the Ukrainian market. They were forced to close their businesses.

Currently, the situation remains stressful and difficult. The evacuation of tens of thousands of specialists from dangerous regions of the country was a big challenge for everyone. And those who prepared for this in advance, had an Emergency Response Team and a clear Business Continuity Plan, which they began to implement immediately, and were able to more easily survive the most difficult times at the end of February and the first months of spring. And, despite everything, we continue to work and fill the country's budget.

UKRAINE HAS A GROWING PROFESSIONAL SERVICES MARKET THAT OFFERS DIVERSIFIED SOLUTIONS

Professional services market revenue in Ukraine, Mn USD ^{1,2}



In 2021, the **professional services market in Ukraine exceeded 1 Bn USD**, increasing at a CAGR of 9.0% for the past two years. Considering the high quality of services provided by auditors, lawyers, consultants, and researchers in Ukraine, as well as the diversity of their service offerings for businesses and public sector clients, **the industry has the potential for further development in the post-war economy.**

Key trends on the professional services market in Ukraine

Professional services companies in Ukraine are widely adopting **digital solutions and advanced technologies** in order to enhance the quality and added value of their service offerings.

Professional services companies in Ukraine are actively developing **hybrid working formats** aimed at accessing a new pool of talent, regardless of their location.



In view of the rising client demands and expectations, professional services companies in Ukraine pay special attention to the constant **improvement of client experience.**

Since employees are a key asset in the professional services industry, Ukrainian companies are offering **various learning opportunities** for the development of human capital.

Ukrainian consulting firms are **strengthening their strategic and transformational offerings** in view of the potential growth in demand for these services amid the post-war recovery of businesses in the country. Consultants can also facilitate the alignment of investment processes with the requirements of investors and other stakeholders, ensuring the efficient use of funds.

OPINION CORNER

Oleksandr Maksymenko

Talks about Professional services, Business Development, Outsourcing, and Consulting



Ukrainian professional services industry is highly developed and **able to support projects of any complexity, field of activity, and duration.** It is represented by **legal services, audit, management consulting services, accounting, and tax consultancies.** Foreign investors are free to choose either a global professional services company or a local one to receive professional support in any sphere of business activity.

Source: State Statistics Service of Ukraine; Consultancy website; Media overview
 Notes: (1) The analysis is focused on 4 segments of the professional services market; (2) Figures are converted based on the average exchange rate provided by the NBU

AFTER THE WAR, UKRAINIAN LEGAL FIRMS WILL CONSULT ON LEGAL AND REGULATORY MATTERS

Selected leading companies on the legal services market in Ukraine¹



The Ukrainian legal services sector is characterised by a **large number of market players and a high level of competition** between them. The market is represented by international law firms (Baker McKenzie, CMS, DenTn, etc.), regional firms (for example, Kinstellar), as well as national firms, such as Asters, Avellum, and Aequo. These companies are often **recognised by reputable international rankings** due to the high quality of services they provide.

Selected projects of the leading legal companies in Ukraine

<p>Period: December 2021 Industry: Agriculture Service: M&A</p> <p>Ukrainian legal firm advised InVivo Group on the merger with Soufflet Group, one of the major deals in the agriculture sector within the last decade. Services included obtaining merger clearances in Ukraine and other jurisdictions.</p>	<p>Period: September 2021 Industry: Public sector Service: Finance</p> <p>One of the Ukrainian legal companies provided advisory services on the issuance of 1.25 Bn USD of Eurobonds by Ukraine. This was the first issuance of Ukraine's Eurobonds, admitted to listing on the LSE.⁴</p>	<p>Period: July 2021 Industry: Construction Service: Finance</p> <p>A leading Ukrainian legal firm acted as the legal counsel to the Black Sea Trade and Development Bank in connection with the provision of 20 Mn USD financing to the group of companies owning two shopping malls in Kyiv.</p>
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The role of legal companies in the post-war economy of Ukraine



Participate in the development of legal acts in various spheres (economy, society, environment, etc.)



Provide legal advisory services to foreign companies on entering the Ukrainian market



Provide legal services to businesses on M&A deals, privatisation, and land lease matters



Consult institutions on the procedures of confiscation of Russia's assets located in third countries



Initiate investment arbitration regarding the destruction of property due to the war



Represent victims in the international tribunal, which was organised to bring Russian war criminals to justice

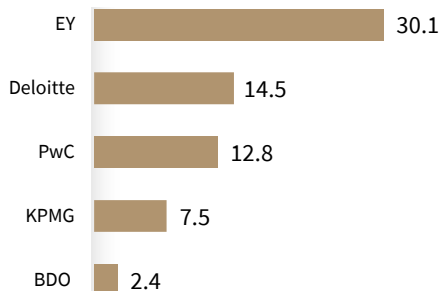
Source: Media overview

Notes: (1) Selected law firms according to the ranking of Yurydychna Hazeta in 2021. These include Asters, Sayenko Kharenko, Ilyashev & Partners, Arzinger and Avellum; (2) Numbers are converted based on the average annual exchange rate by the NBU in 2020; (3) Latest available; (4) London Stock Exchange

ACCOUNTING FIRMS CONTINUE TO PROVIDE CLIENTS WITH AUDIT & TAX SERVICES DURING THE WAR

Selected leading companies in the audit and tax services market in Ukraine

Revenue in 2020, Mn USD^{1,2}



Top-5 selected leading audit and tax firms in Ukraine generated more than 65 Mn USD of revenue in 2020. Their market share amounted to 23.0% in 2020

In 2020, audit, accounting, and tax consulting services comprised the largest share of the professional services market in Ukraine. The sector is characterised by a **high level of competition between international and local firms**, providing services to public and private businesses from different industries. **Accounting firms in Ukraine are often engaged in large public projects** to enhance the transparency, efficiency, and credibility of these projects.

Other audit and tax companies in Ukraine in total generated 224.7 Mn USD of revenue in 2020

Selected projects of the leading audit and tax companies in Ukraine

Period: **June 2022**
Industry: **IT**
Service: **Due Diligence**

One of the leading audit and tax firms in Ukraine conducted legal, tax, and financial due diligence for Nortal, a global digital transformation provider, in its acquisition of Skelia, the international leader in building cross-border IT organisations.

Period: **February 2022**
Industry: **Media**
Service: **Audit**

One of the leading accounting firms in Ukraine acted as an independent advisor in verifying the correctness of the calculation of votes on the National Selection for the international Eurovision song contest in 2022.

Period: **July 2020**
Industry: **Hospitality**
Service: **Audit**

The Ukrainian office of one of the global accounting firms conducted an audit of financial statements for the privatisation of the Dnipro Hotel in Kyiv. The hotel was sold to an investor in a public auction for more than 40 Mn USD.

The role of audit and tax companies in the post-war economy of Ukraine



Participate in the development of plans and programmes for the post-war economic recovery of Ukraine



Audit losses and impairment of property value that was partially or fully destroyed during the war



Provide audit and accounting services to ensure the reliable access of clients to information in times of uncertainty



Offer legislative proposals and regulations on preferential tax regimes for foreign and national businesses



Participate in the auditing of objects in the course of continuing large-scale privatisation in Ukraine

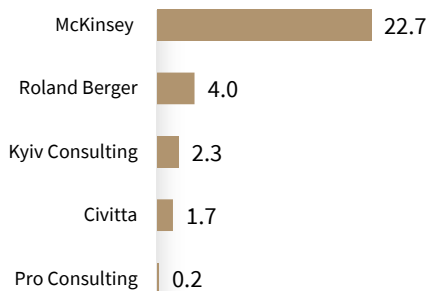


Participate in the development and implementation of the anticipated systemic reform of Ukrainian tax law

BUSINESS CONSULTANTS ARE READY TO TAKE PART IN THE POST-WAR RECOVERY OF UKRAINE

Selected leading companies on the consulting services market in Ukraine

Revenue in 2020, Mn USD¹



Top-5 selected leading consulting firms in Ukraine generated more than 30 Mn USD of revenue in 2020. Their market share amounted to 12.8% in 2020

The Ukrainian management consulting industry is highly competitive, **including around 300 international and local companies** of different sizes and focuses. They provide **a wide range of highly diversified service offerings** to businesses from different industries (manufacturing, oil and gas, banking, etc.), as well as to clients from the public sector, advising government institutions, international organisations, NGOs, and state enterprises.

Other consulting companies in Ukraine in total generated 210.1 Mn USD of revenue in 2020

Selected projects of the leading consulting companies in Ukraine

Period: **June 2022**
Industry: **Public sector**
Service: **Strategy**

One of the leading management consulting companies in Ukraine participated in the development of the post-war National Recovery Plan for the country in cooperation with government authorities.

Period: **March 2021**
Industry: **Manufacturing**
Service: **Corporate Finance**

One of the leading regional consulting firms in Ukraine provided corporate finance services to SMEs² from Eastern regions of Ukraine for the purpose of obtaining debt and equity financing in the amount of more than 1 Mn USD.

Period: **January 2020**
Industry: **Infrastructure**
Service: **Strategy**

Ukrainian office of one of the global strategy consulting companies participated in the development and verification of the project of corporate strategy by 2025 for Ukrainian Sea Ports Authority.

The role of consulting companies in the post-war economy of Ukraine



Participate in the development of initiatives on the post-war economic recovery of Ukraine



Prepare go-to-market strategies for foreign companies on entering the Ukrainian market



Support business process optimisation for companies affected by the war



Provide strategy and transformation services for companies to leverage opportunities in the post-war economy



Provide a full range of advisory services to foreign partners on the investment process in Ukraine



Consult businesses in Ukraine on a number of relevant topics (supply chain resilience, risk management, digital, etc.)



The business consulting market in Ukraine will boom!



In addition to political and economic skills, cultural and social aspects must also be taken into account!

JÖRG HOSSENFELDER

CEO of Lünendonk & Hossenfelder

Involvement during Russia's war against Ukraine: Jörg has already for years long-lasting business relations with Ukraine. Lünendonk is a famous market research company from Germany. In Lünendonk's upcoming 'Consulting Handbook' which will be published in November 2022 the business consulting market of Ukraine will be an important topic. Due to the special demand for professional consulting services in Ukraine – also from international consultancies – after the war, Jörg and his team are planning to publish in Spring 2023 a 'Ukraine Special' about leading business consultancies in Ukraine and how they will help to rebuild Ukraine.

No successful transformation can happen without the skills of consultants. Is it the same when transforming an entire country?

With the exception of the purchasing process, the consulting activities of companies and government institutions are very similar. The larger the client, the more complex the challenges. Furthermore, not only the on-site situation, but also the exogenous framework conditions such as global supply chains, energy and production factors, technical and service staff, etc. are among the factors that must be taken into account. In addition, agility and speed play a special role, which is now very much taken up by the consultants. Especially with regard to the reconstruction of Ukraine, these are essential success factors.

What key consulting capabilities do the future consultants of Ukraine need to bring?

As mentioned before, besides the consultant skills, years of knowledge of Ukraine are part of the basis of the consultants. In addition to political and economic skills, cultural and social aspects must also be taken into account if projects are to run successfully together with the clients. Management consultants who want to establish a successful consulting business in Ukraine should take this into account.



The world will be very much interested in a new and strong Ukraine



Ukrainian business has lived through various crisis situations over the last decades. However, this one is, without doubt, the most serious test for resilience which we have ever seen. It has therefore shaped the demand for legal services accordingly. Almost all major businesses were forced to go through corporate & financial restructuring, downsizing and adoption of new business models, as well as to revise their supply chains, customer & distribution channels, look for new markets and business opportunities abroad.

TIMUR BONDARYEV

Arzinger Law Office, Attorney-at-Law, Founding & Managing Partner, Ukraine

Involvement during Russia's war against Ukraine: Timur holds an active civic position and puts efforts to raise awareness on the war-related issues by assisting in raising funds to support the Ukrainian army and refugees. Timur evacuated a large part of his staff to Lviv and started to support public and private clients, who have suffered material war-caused damage, with their future international claims against Russia.

What role will the legal business play in the post-war recovery of the Ukrainian economy? Which services will be in the highest demand from the side of businesses and the public sector?

Already at this stage we see numerous serious requests from both public & private sectors related to future rebuilding of Ukraine. We are confident that services provided by major diversified law firms will be very much in demand in the new post-war Ukraine. Property & Construction, Public-Private Partnership, Project Finance, Capital Markets, M&A, Employment, International & Domestic Tax and other expertise will be in great demand in the years to come. Needless to say, that significant emphasis will be in the area of damages, Russia will have to pay for all crimes & atrocities committed in Ukraine and this process will keep lawyers from all over the world very much busy for the next decade or two.

How do you assess the future of the legal services market in Ukraine? Will the war launch new trends in the market, as well as new business processes at legal companies?

The post-war legal services market will most probably look very much different since not all existing players will survive the war. Having said this, those firms, which will be able to swiftly adopt and adjust themselves to the new reality, and therefore survive the war, will be the actual winners. I believe that the world will be very much interested in a new and strong Ukraine. New / old foreign investments will arrive, market shares in all sectors of the economy will be redistributed, new strong players will emerge in every industry and we will see the economy growing dramatically. This will require proper legal support, which shall be provided according to the best international standards.



Post-war foreign investments are likely to reach unprecedented levels



It is expected that Ukraine will attract approximately 750 Bn USD in external investments through interstate grants, debt / equity loans and private investments, such as public-private partnerships. The legal business will be a necessary pillar for building up the post-war economy structure.

Foreign investment will increase to a level never seen before. We expect a higher amount of state tenders within the public sector. In particular, the infrastructure sector will place an almost indefinite list of tender projects to rebuild the entire infrastructure in our country destroyed by the illegal Russian war.

ARIO DEGHANI

Counsel at Baker McKenzie

Involvement during Russia's war against Ukraine: Ario Dehghani takes an active social position by raising awareness of Russia's war against Ukraine on social media and communicating a true message on the course of the war developments. In addition, Baker McKenzie undertook prompt measures to relocate employees and their entire families to other countries.

Against the background of the reducing business activities what measures have been taken by your company to support the business and secure its functioning in new conditions?

The major resource of our business is our employees. Our management did everything possible to protect our employees from the threats posed by the war, including the relocation of our colleagues and their entire families to other countries (more than 13 countries in the EU). The colleagues that are staying in Ukraine are being supported to continue their work while staying safe and secure.

Since the beginning of Russia's war against Ukraine, the Baker McKenzie Kyiv office has received tremendous support from the Baker McKenzie offices worldwide. Ukrainian colleagues were provided with a safe haven and immense practical support by Baker McKenzie offices in other European countries. Many colleagues were included in business projects of other Baker McKenzie offices. Our Kyiv office also had new areas of work due to the changed conditions in our country.

How do you assess the future of the legal services market in Ukraine? Will the war cause the emergence of new trends in the market and business processes of legal companies?


We see a future shift in the legal sector to more Western-driven law support. Ukrainian law itself is expected to become more compliant with European standards. However, the demand of foreign investors will drive changes in the legal market. The war casualties and the overall breakdown of the local economy will hit the purely local-oriented law firms. Global law firms will probably have a competitive advantage to cover the 360-degree scope of needs, also heavily driven by foreign law. The product range of legal services will change as well. The protection of foreign investments in Ukraine will be a strong demand and Ukrainian law firms will adjust to a more European law-driven approach to service, knowledge, experience, and standards. Compliance with foreign anti-corruption and Western corporate governance standards will play a key role in protecting the interests of foreign and local investors.



Let us speak
LOUDLY AND STRONGLY,
so that people around the world
hear our Voices.



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