

Supporting Ukraine: A Study on Potential Recovery Strategies for Ukraine

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European
Investment Bank



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The findings, interpretations and conclusions are those of the authors and do not necessarily reflect the views of the European Investment Bank.



Ukrainian context

Background to the Ukrainian conflict

On 24 February 2022, Russian military forces entered Ukrainian territory, violating Ukraine's national sovereignty and international agreements including the 1994 Budapest Memorandum, and the Charter for European Security, ratified in 1999's Istanbul Document. This would represent the start of a full-scale invasion into Ukraine, and the beginning of the largest war in Europe since the Balkan conflicts of the 1990s.

Russia's large-scale attack was preceded by months of troop buildup at the border under the false pretense of a military exercise. Political justification propaganda for the attack was produced by the Russians on 21 February, by recognizing the independence of the Luhansk and Donetsk People's Republics, and falsely claiming they must protect the Russian-speaking minority in eastern Ukraine. These two breakaway provinces are themselves a result of a protracted eight-year conflict orchestrated by Russia, which crippled Ukraine's economy, as industrial areas, rich in natural resources, were lost. Furthermore, illegal referendums were organized by Russia in four Ukrainian regions (Donetsk, Luhansk, Zaporizhzhia, and Kherson) in an attempt to falsely legitimize its military occupation and annex the territories. However, the devastating impact of the current large-scale war stretches far beyond the

bordering provinces, with Russia opening a front more than 1,200km wide and reaching as deep into Ukraine's territory as the outskirts of Kyiv. As a result of overall hostilities, after the first nine months of fighting, it was estimated there were over 8 million refugees abroad plus an additional 5.9 million internally displaced people. Further examples of devastation include: more than 150,000 homes destroyed; 27% of the railway network disrupted; the entire oil refining capacity destroyed, with oil supply 30% down; and energy production capacity reduced by at least 40%. Thus, the Ukrainian economy, strangled by the war, is expected to shrink by nearly 30% in 2022 and has become reliant on foreign aid.

Initial international response

The outbreak of the war was the catalyst that triggered wide-scale support for Ukraine and its people. The Western international community quickly mobilized aid to Ukraine politically, financially, and militarily, aware of the scale of humanitarian needs and of the strategic significance of an independent Ukraine. Russia was isolated politically and hit with economic and financial sanctions in a coordinated approach. Military powers, including the USA and the UK, donated significant military help to contain and repel the invasion. EU countries neighboring Ukraine gathered support, donations and committed further resources,

while at the same time welcoming Ukrainian refugees and establishing new trade channels. Major international powers, including the EU, are channeling macro-financial aid for Ukraine to help the government cover the vast budget gap that emerged, and provide for the Ukrainian people. These donations are channeled either directly or via the IMF and the World Bank, whose primary focus is now macro-financial aid for the Ukrainian budget. Other IFIs including the EIB, the EBRD, and several smaller institutions continue working, or consider entering Ukraine to provide further budgetary support or targeted emergency economic and social investments. Yet the magnitude of the current help is sufficient only for survival, and further assistance is needed for Ukraine to start regaining its self-sufficiency. Hence the focus must start to shift away from just immediate help and move toward planning comprehensive recovery efforts.

Ukraine EU candidate status

Upon the Russian invasion, on 28 February 2022, Ukraine applied for EU membership. On 17 June 2022, the European Commission recommended to Council confirming Ukraine’s perspective to become member of the EU and provided its opinion on granting it candidate status. The European Council subsequently acknowledged the considerable effort that Ukraine has made to become closer to the EU under very difficult circumstances and the candidate status was formally granted on 23 June 2022. The EU accession process remains based on established

criteria and conditions, however granting Ukraine swift future EU membership perspective signals long-term support for Ukraine development.

Lugano conference

On 4 July, delegations from Ukraine, countries allied to Ukraine, international institutions, and multiple additional partners met in Lugano at the Ukrainian Recovery Conference. The event was attended by multiple heads of state—including the Ukrainian Prime Minister, Denys Shmyhal, and the president of the EU Commission, Ursula von der Leyen—as well as representations of major international institutions, including EIB, EBRD, IMF, World Bank, and the OECD.

The conference represented a kick-off for international efforts to reconstruct Ukraine, affirming the long-term commitment toward Ukraine, and roadmapping the recovery plan. It gave an opportunity to share a vision of future cooperation and form partnerships between the key attending parties. It also brought focus to the vast investment needs for the recovery and long-term modernization of the Ukrainian economy. Countries allied with Ukraine volunteered to take a patronage over recovery efforts in chosen regions of Ukraine disrupted by the war. As a result of the conference, seven key principles for international aid of Ukrainian recovery were established.

Figure 1: Principles of Ukraine’s recovery process



Partnership

The recovery process led by Ukraine, with international partners. Based on assessment process, aligned priorities, joint planning for results, accountability, and monitoring.



Multi-stakeholder engagement

The recovery process has to facilitate collaboration between all actors, including the private sector, civil society, academia, and local government.



Reform focus

Achieving Ukraine’s reform efforts and resilience in line with Ukraine’s European path.



Gender equality and inclusion

The recovery process has to be inclusive and ensure gender equality and respect for human rights.



Transparency, accountability, and rule of law

All funding for recovery needs to be fair, accountable, and transparent.



Sustainability

The recovery process has to rebuild Ukraine in a sustainable manner aligned with the 2030 Agenda for Sustainable Development and the Paris Agreement.



Democratic participation

The recovery process has to be a whole-of-society effort, rooted in democratic participation by the population.

National Council for the Recovery of Ukraine

During the Lugano conference, the National Council for the Recovery of Ukraine from the War (NRC), a special advisory body under the president of Ukraine, presented Ukraine's National Recovery Plan (NRP). The plan is the main framework document that roadmaps the recovery process. The NRP comprehensively outlines investment needs in the years to come, elaborating on how to build up the needed resilience to win the war, guiding reconstruction efforts and facilitating the long-term modernization and growth of the economy.

The presented programs focus on strategic objectives, enablers, and transformation engines to achieve the set targets. The NRC estimates that implementation of the programs will amount to around \$750 billion spread over three times horizons:

- Urgent resilience (2022) - Addressing severe needs that have appeared due to the military situation and resulting destruction of infrastructure - \$60 billion–\$65 billion
- Recovery (2023–2025) - Enabling Ukrainian economy to return to full capacity - \$250 billion–\$300 billion
- Modernization (2026–2030) - Facilitating long-term transition into a modern and sustainable economy - \$400 billion–\$450 billion

Various organizations contributed to, assessed, and are working on addressing the National Recovery Plan. The European Investment Bank and Boston Consulting Group were both heavily engaged in supporting Ukraine during the Lugano recovery conference and jointly partnered to continue working toward a free and modern Ukraine.



How the war affected Ukraine—our diagnosis of the situation

When setting out to diagnose the fluid and complex situation in Ukraine, it is important to consider that simply analyzing war damages and resulting needs would only offer a narrow view of the status quo. Thus, the optimal diagnosis approach consists of first drawing out war scenarios, stress-testing them with topic experts, and judging their likeliness of realization. This allows for a holistic approach while having in mind the potential outcomes over a 10-year horizon.

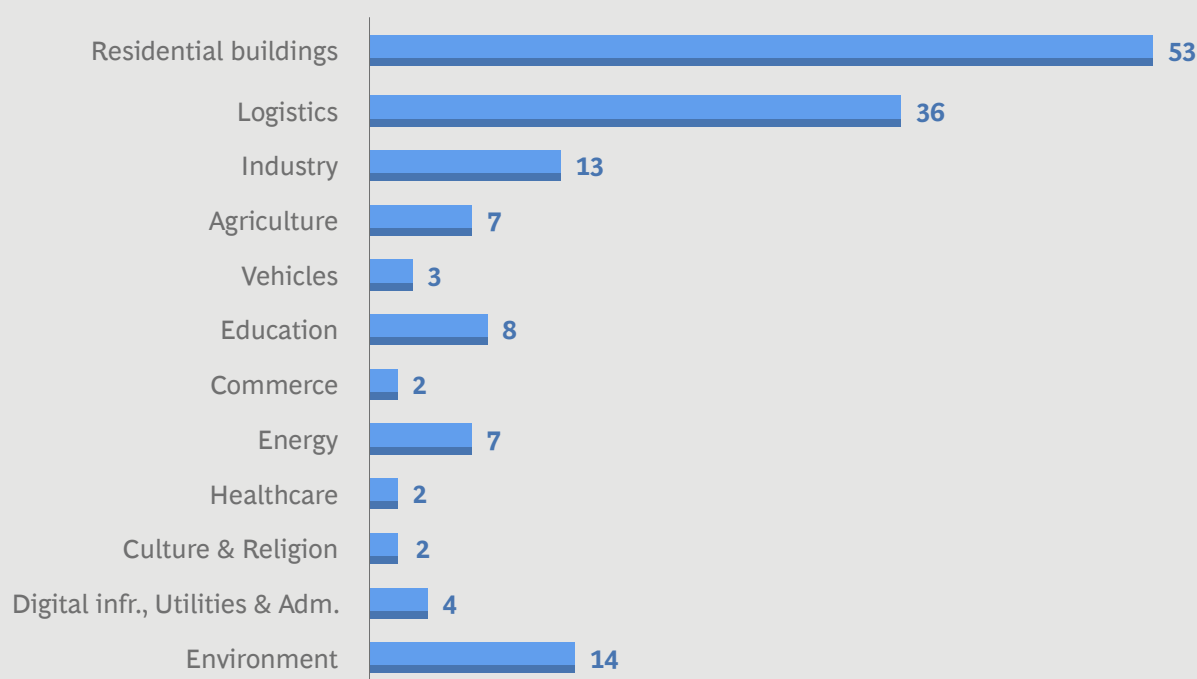
The economic situation was analyzed at a macro level, followed by deep dives into several key areas, which allows for the understanding of the cause-effect relationships and the identification of interdependencies within the Ukrainian ecosystem. This two-pronged approach provides a bird's-eye view of the situation while also benefiting from the granularity needed to pinpoint the most impactful initiatives that can strengthen Ukraine in the existing and future contexts.

War damages

Eight months into the invasion, the ongoing fighting has already left a deep scar on Ukraine's infrastructure,

particularly in the east and south, where the war has been raging most intensely. The Kyiv School of Economics (KSE) assessment as of November brings the damage estimations to a total of \$135.9 billion, with housing (\$52.5 billion) and transportation infrastructure (\$35.6 billion) accounting for a combined 65% of total damages. Furthermore, damages to the industry and business sectors amount to an estimated \$13 billion, as 412¹ industrial enterprises are reported to have been damaged or destroyed. The World Bank's estimated damage as of 1 June amounts to \$97 billion, similar to KSE's assessment at the time, thus confirming the vast extent to which Ukrainian infrastructure has suffered since the onset of the invasion. The majority of damages remain nevertheless in inaccessible areas (somewhere around 75% of the total), as only the north and northeastern regions (Chernihiv, Kyiv, Sumy and Kharkiv) have since been secured and are not currently part of the frontline, while fighting is still ongoing in the eastern and southeastern parts of Ukraine (Donetsk, Luhansk, Zaporizhia, Kherson, Mykolaiv). The proximity of the frontline makes rebuilding initiatives potentially redundant until a certain degree of security can be ensured, as civilian infrastructure has been targeted time and again since the beginning of the conflict.

Figure 2: Kyiv School of Economics damage estimates as of November (B\$)



Source: Kyiv School of Economics

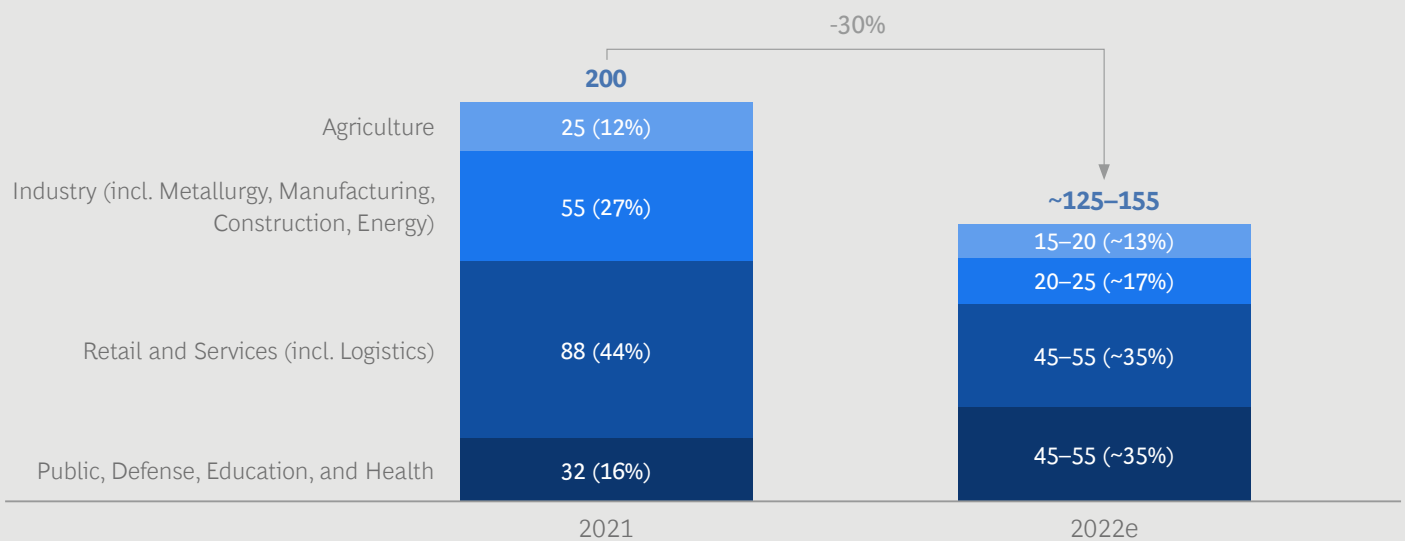
1. As of 5th September

Economic and social diagnosis

The war had widespread effects on the Ukrainian economy, with the National Bank of Ukraine projecting a 30% drop in GDP for 2022, while inflation was already at 24.4% in September and is tipped to reach 30% by the end of the year.

Under war conditions, the initial forecast for the monthly state budget deficit was estimated at around \$5 billion, and the total 2022 deficit was expected to be in the range of 30% of GDP. Five months after the start of the war, budget revenues without external financing would cover only 40% of the expenses, yet the deficit was narrower than expected as of September, at about \$13.5 billion, thanks to increases in grants received from abroad, which are classified as state budget revenue.

Figure 3: Distribution of GDP by sector, 2021 data and 2022 estimate
GDP by sector and expected decrease (\$B)



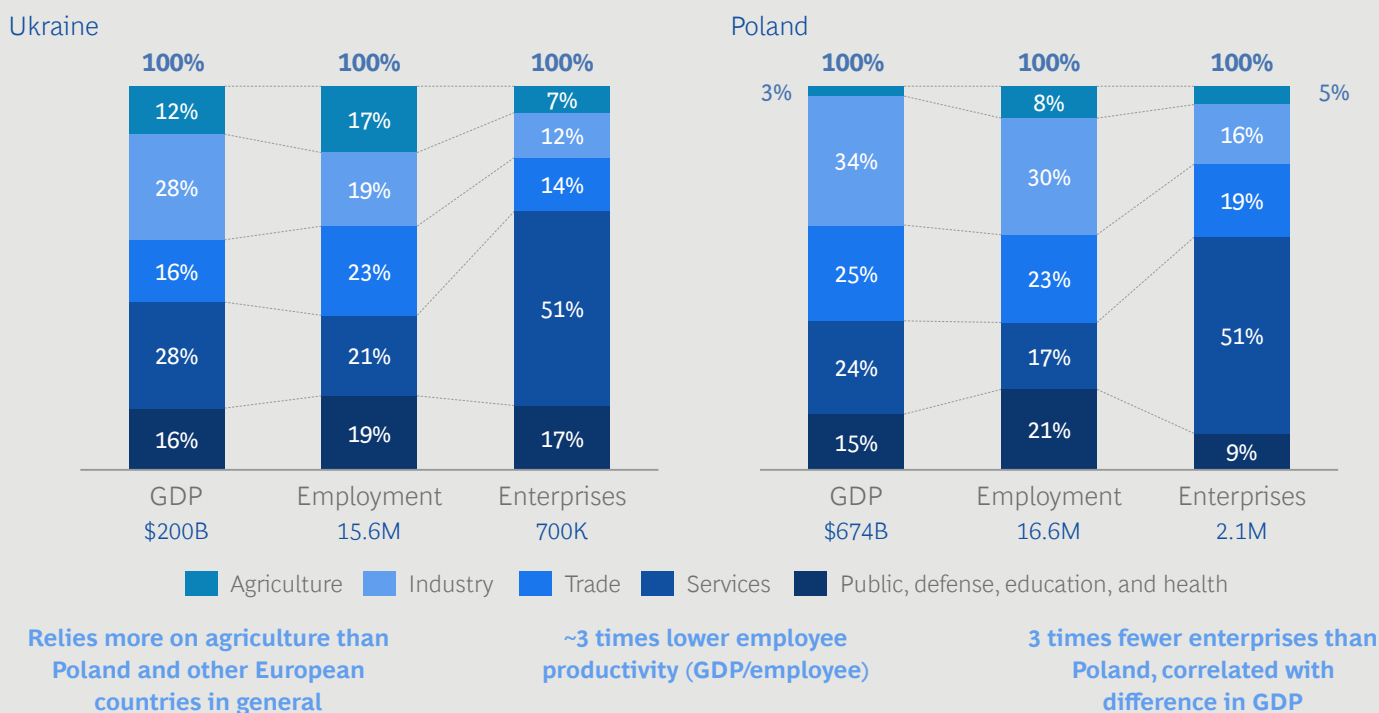
Source: State Statistics Service of Ukraine

The pre-war share of exports in Ukraine’s GDP was of around 35%, and the Ministry of Economy’s goal is to steadily increase it to 50% as the transport bottlenecks will gradually fade out. Compared to neighboring Poland, the

Ukrainian economy has a strong agrarian base and is less trade-focused, while a gap can be noticed in employee productivity statistics, as outlined in the graphic below.

Figure 4: GDP and employment distribution by sector for Ukraine and neighboring Poland

% of GDP, Employment, and Enterprises by sector, 2021



Source: State Statistics Service of Ukraine; Financing SMEs and Entrepreneurs 2020: An OECD Scoreboard

Around 61% of the country's population is estimated to have been directly affected by the conflict, with around 13 million stranded in affected areas, 5.9 million internally displaced, and 8 million having fled abroad, both permanently and temporarily, as of the end of September, according to UN data. The flows of internal refugees fomented instability in several central and western regions, as local infrastructure capacity could not cope with the needs of the increasing population flows. This resulted in large imbalances in terms of rent prices, which increased up to threefold in certain areas where demand was too high and citizens were having to shelter in public schools or gyms while severely decreasing in other cities that were experiencing negative net population flows. The fear and uncertainty stemming from the war has been exerting a heavy toll on Ukrainian citizens, with 59% of adults aged 18–60 reporting they have been experiencing physical health issues, while 61% reported to have been experiencing mental health issues.

The effects of internal displacement have sent ripples throughout the whole country, with severe consequences on businesses. As people began fleeing the war zones and adjacent areas, orders stopped coming in and business activity in the affected regions almost grinded to a halt. The SME sector, providing about 60% of employment and 20% of pre-war GDP, was severely hit, as only 13% of SMEs

were still working in full during March, and 42% were not working at all according to a survey conducted by the European Business Association. Results improved in July, as 28% of enterprises reported to be working in full, while only 16% affirmed they were not working at that time. The National Bank of Ukraine estimated unemployment reached 35% at end of July, while one in five Ukrainians reported having a job but receiving only partial wages.

Trade was subsequently hampered as the invasion progressed in the east and south of Ukraine, yet the biggest blow was dealt by the blockade of seaports. Accounting for about 70% of the total export volume, seaports were crucial for the outgoing flows of grain and raw materials, which represented the bulk of Ukrainian exports. Logistical bottlenecks stemming from the limited transport capacity of land routes caused exports to plummet after the start of the war. The 37% growth in export value during the first two months of the year could not compensate for the 48% reduction between March and June, according to data provided through the State Statistics Service of Ukraine. During the first half of 2022, total export value decreased by 24%, while total volume was down by 30%. Chemical industry products (-68%), metals (-57%), and minerals (-30%) were among the most affected categories in terms of volume, as industrial activity decreased and the remaining available transport

routes could not compensate for the lost capacity of maritime shipping.

Additionally, as the rate of decrease in import value was lower than in export (18% versus 24%), the negative trade balance has more than doubled (from \$1.2 billion to \$2.6 billion) during the first half of the year.

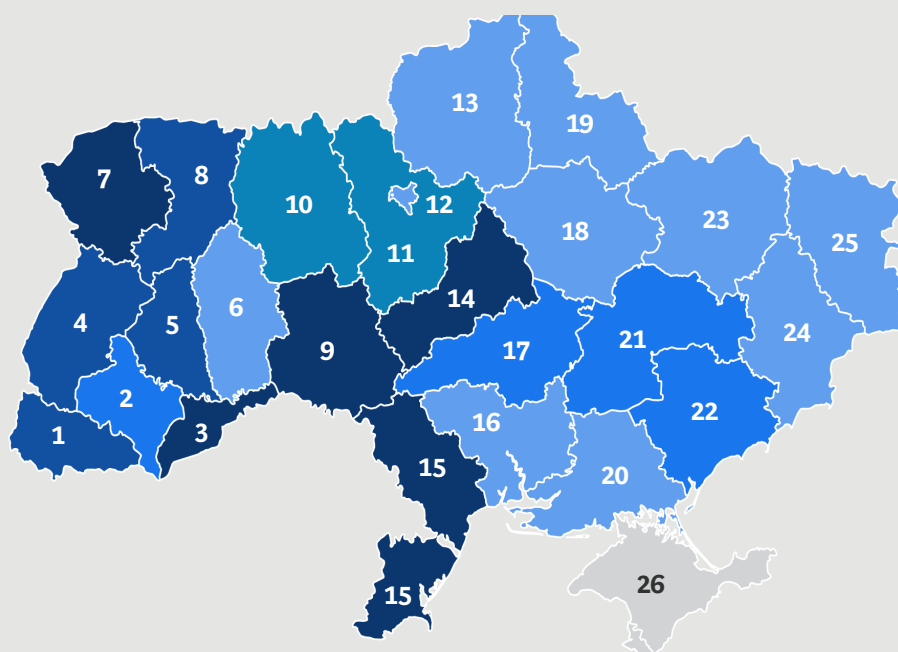
Recently, more optimistic signs started to emerge with the partial unblocking of the Odesa port, as total export tonnage increased from 5.8 million tonnes in July to 9.7 million tonnes in September, while total turnover for September exports was of \$4.1 billion, compared to the \$2.9 billion registered in July. This allowed for a monthly decrease in the balance of trade in goods, which was only

\$0.3 billion for September, and around \$5.5 billion for the first nine months of the year.

Given that most eastern enterprises lowered or stopped production, the central and western regions began playing a more important role in Ukraine's economy. The flow of exports has gradually shifted, and most of the central and western oblasts either grew or moderately decreased during the first seven months of the year, albeit at a slower pace than the country average, while in the eastern half of Ukraine exports decreased by almost half in most oblasts, as seen in the graphic below. Revitalizing the economy and de-bottlenecking transport flows in key areas is now of utmost importance for bolstering Ukrainian resilience and enabling a self-sustaining economy.

Figure 5: Distribution of exports per oblast

Y-o-y change in export flows by oblast of production for period of January – July (and % of 2021 total)



1. Zakarpattia +19.4% (2.5%)
2. Ivano-Frankivsk -36.9% (1.7%)
3. Chernivtsi +29.3% (0.3%)
4. Lviv +4.8% (4.3%)
5. Ternopil +18.9% (1.0%)
6. Khmelnytskyi -15% (1.3%)
7. Volyn +25.2% (1.2%)
8. Rivne +13.7% (1.0%)
9. Vinnytsia +24.2% (1.9%)
10. Zhytomyr -10.0% (1.1%)
11. Kyiv -6.5% (3.8%)
12. Kyiv City -25.8% (22.5%)
13. Chernihiv -44.4% (1.8%)
14. Cherkasy +45.3% (1.3%)
15. Odesa +59.3% (2.5%)
16. Mykolaiv -13.6% (5.1%)
17. Kirovohrad -18.2% (1.5%)
18. Poltava -39.8% (4.7%)
19. Sumy -38.1% (1.6%)
20. Kherson -61.5% (0.6%)
21. Dnipropetrovsk -38.9% (18.0%)
22. Zaporizhzhia -12.7% (7.0%)
23. Kharkiv -46.4% (2.7%)
24. Donetsk -93.7% (10.3%)
25. Luhansk -90% (0.2%)
26. Crimea

Note that -28% decrease in y-o-y export flows is the average for the country

Source: Ukrainian National Service of Statistics, National Institute of Strategic Studies of Ukraine

Sectorial and topic diagnosis

The resulting picture is granular and intricate, going far beyond the visible infrastructural damage and military

obstruction to economic activities. Key needs per sector have been identified as shown here.

Figure 6: Key problems and needs identified per sector in Ukraine

Economy



Agriculture

Grain exports decreased up to 90% during 2022 H1

Invest to store current harvest and process yields

Need financing for next year's harvest (fertilizer, seeds, stock)



Industry

Metallurgy and mining production down ~65%

Re-locate (where possible) and re-focus logistics (e.g., to EU)

Working capital needed



Construction

Construction sector frozen—limited demand

Survive and reorient business toward reconstruction efforts

Finalize advanced projects



Retail and services

~50% of businesses stopped, but 40% are hiring new staff

Relocate to safer areas

Working capital to relocate, restart, survive until fully sustainable

Infrastructure & Energy



Logistics

Deep-sea shipping irreplaceable for bulk transport (e.g., grain)

Secure export capacity to Constanta port and EU borders

Integrate with EU rail and road

Repair key damaged roads, rails, and airports



Municipal

Improve residential energy efficiency

Modernize water and district heating facilities

Provide risk guarantees for mortgages



Fuel

Oil supply ~30% down

Increase transport capacity for refined fuels

Enable fuel trade routes through the Danube

Develop domestic biofuels production



Electricity

Strengthen grid due to new distribution & transport needs (e.g., production for export)

Fill the gaps in fuel demand with power where applicable

Assistance to provide access to electricity given 50% of energy infrastructure destroyed



Functioning operation



Moderate disruption, limited operation



Severe disruptions, operations crippled

Agriculture

Agricultural production has been continuing, albeit at a lower level, despite the challenges posed by the war. Output has fallen as vast areas have been occupied or mined, and an acute need for storage and transport capabilities became increasingly evident once the 2022 harvest began to be collected. Investments are now needed to address these bottlenecks, while ramping up processing and moving the goods higher on the value chain would provide another solution to cope with the lower export capacity and increase production value.

One of the key sectors of the Ukrainian economy, agriculture was responsible for about 12% of GDP and 17% of employment before the war. Given that around 90% of grain was shipped through the Black Sea ports before the war, exports for April were down to only 20% compared to December 2021, but were approaching pre-war levels in September.

Increasing transport capacity via rail, rerouting shipments via the Danube toward the port of Constanta, and the

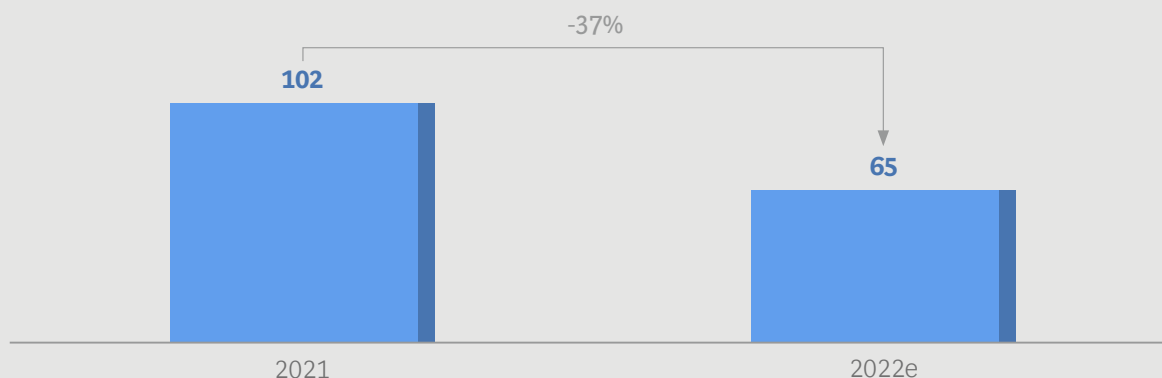
temporary agreement to allow grain shipments depart from Ukrainian seaports have fostered a gradual recovery of agricultural exports, which were down an estimated 25% y-o-y as of September.

The lack of export capacity generated issues in grain storage, and a shortage of around 25% of this year's crop is estimated, as last year's harvest is yet to be fully sold. The shortage in storing capacity could have been even larger if not for the decrease in this year's production volumes. With around 30% of agricultural land affected by war, grain and oil production volumes are estimated to fall during 2022 by around 30%–40% according to Ukrainian forecasts, while the crisis is further exacerbated by rising prices and shortages in fuel, seeds, and fertilizers.

Ensuring there is enough storage space and transport capacity to unlock exports is now key for agricultural companies, while the smaller players would also need to be provided with working capital support for procuring seeds and fertilizers for 2023's harvest.

Figure 7: Grain and oil production, 2021 data and 2022 estimate

(M tonnes)



Source: BCG study

Industry

The Ukrainian industry has been heavily affected by the war, not only by direct damages to its factories, but also by rising prices and bottlenecks in transportation. The industrial companies' ability to maintain their businesses profitable has thus been severely limited, forcing them to reduce production and release employees. Investments are now needed to bring down logistics costs, while industrial producers need working capital support to restart their activity.

Increased input prices (energy, logistics, imports), staff shortages, and war destruction (around 412 industrial enterprises estimated to have been lost during the war by beginning of September) had overwhelming effects on the metallurgy and mining sectors, with iron ore exports between January 2022 and August 2022 decreasing by 78% on a monetary basis, while national steel production was down 64% y-o-y between January and August, as the Mariupol factories accounted alone for 40% of yearly steel production.

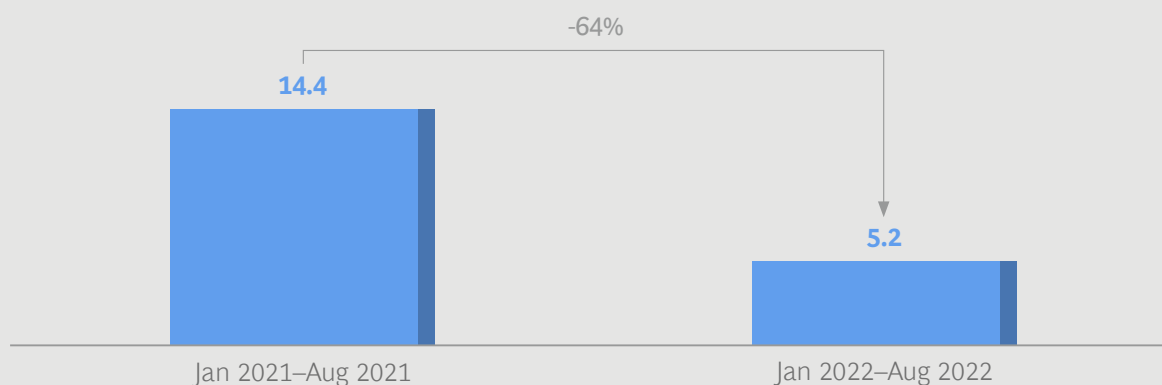
As most of the goods were shipped by sea, existing bottlenecks in land transport and rising tariffs imposed by the Ukrainian railway company drastically decreased profitability for domestic exporters. Additionally, falling prices for metals and raw materials on the global markets (as of July, average industry prices decreased below pre-war levels) forced enterprises to reduce production as they could no longer afford paying all their employees in full. The transport bottleneck was further aggravated with the temporary ban concerning exports of iron and manganese

ore, as the government decided to prioritize grain exports while the sea routes were still closed.

As a result, the volume of exported metals decreased 58% during the first eight months of 2022 and is not expected to rebound as long as the cost management issues persist. Enterprises in the industry sector are in need of working capital to keep their businesses running, but above all, the de-bottlenecking of logistics which would bring down transport costs is paramount for their revival.

Figure 8: Steel production y-o-y variation

(M tonnes)



Source: BCG study

Construction

The construction sector grinded to a halt after the onset of the conflict and mainly began resuming activities in June. The public sector undertook only limited reconstruction initiatives, while private sector initiatives were facing low demand due to the heightened risk stemming from the war.

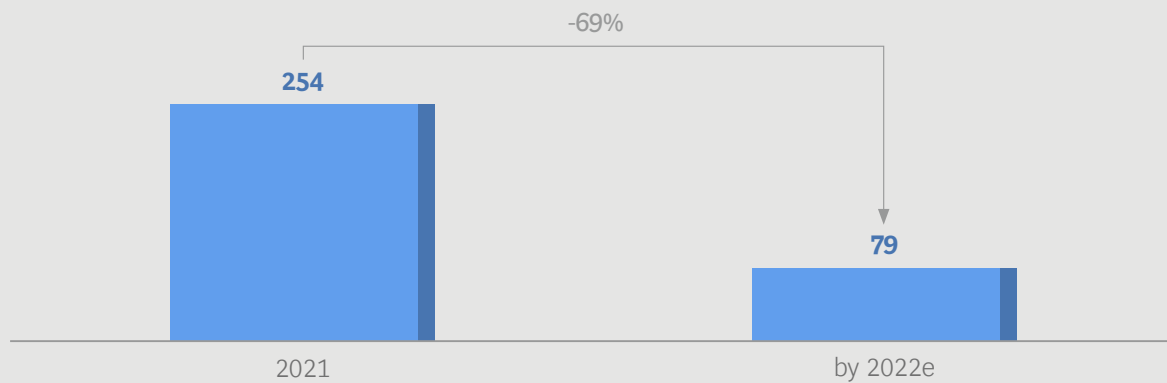
The sector is now characterized by limited demand, staff shortages, and high prices combined with limited availability of materials due to supply chain disruptions.

Among all companies surveyed through the Monthly Business Outlook Survey conducted by the National Bank of Ukraine, the construction sector had the most pessimistic outlook, with an index of 41 (versus the 46 average). The forecast therefore remains grim, with 2022 construction output estimated to fall by around 69% compared to 2021.

Construction companies can be kept afloat by revitalizing demand from both the private and public sectors and by providing enterprises with the necessary financing for equipment and working capital to resume activity.

Figure 9: Construction output, 2021 data and 2022 estimate

(B UAH)



Source: BCG study

Retail and services

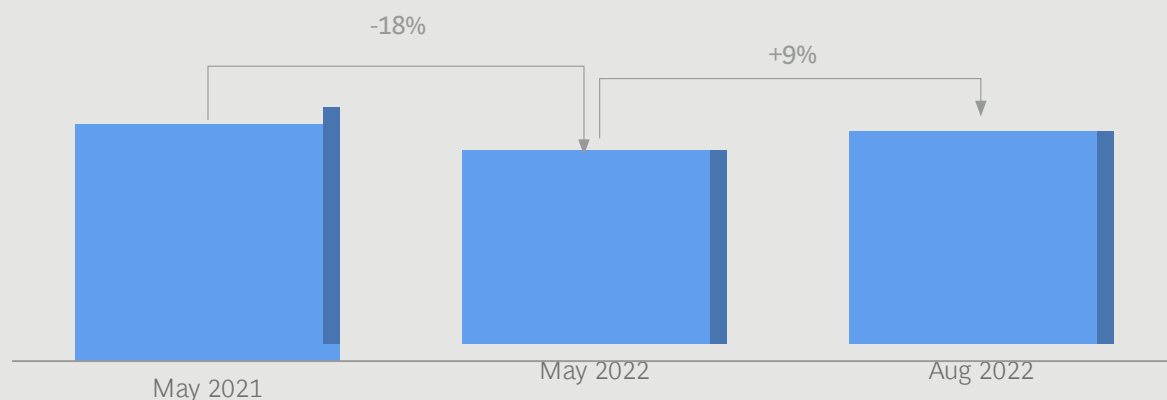
Dampened economic perspectives have severely affected market confidence, as the downward slopes of income, demand, and revenues created a vicious circle that resulted in around half of Ukrainian businesses either stopping activities completely or barely functioning in the months succeeding the invasion. Shortages of staff and storage space, corroborated with higher prices of certain supplies and broken supply chains, have dealt further blows to Ukrainian small businesses.

Quicker to react than the larger industrial enterprises, 700 small businesses already relocated to the western and central regions of Ukraine by mid-summer, where labor is

still in demand and economic activity has not been severely affected.

The number of open retail outlets was nevertheless 18% lower y-o-y as of May 2022 but subsequently grew by 9% as of August, as more optimistic signs have started to emerge. While in May, 19% of the companies reported to the European Business Association that their financial reserves will be enough to cover a period of one year, the percentage grew until 30% as of August. Nevertheless, the majority of companies still require support for working capital, storage space, employee re-skilling and state-sponsored re-location at a larger scale.

Figure 10: Number of open retail outlets, data as of May 2021, May 2022 and August 2022



Source: BCG study

Transport

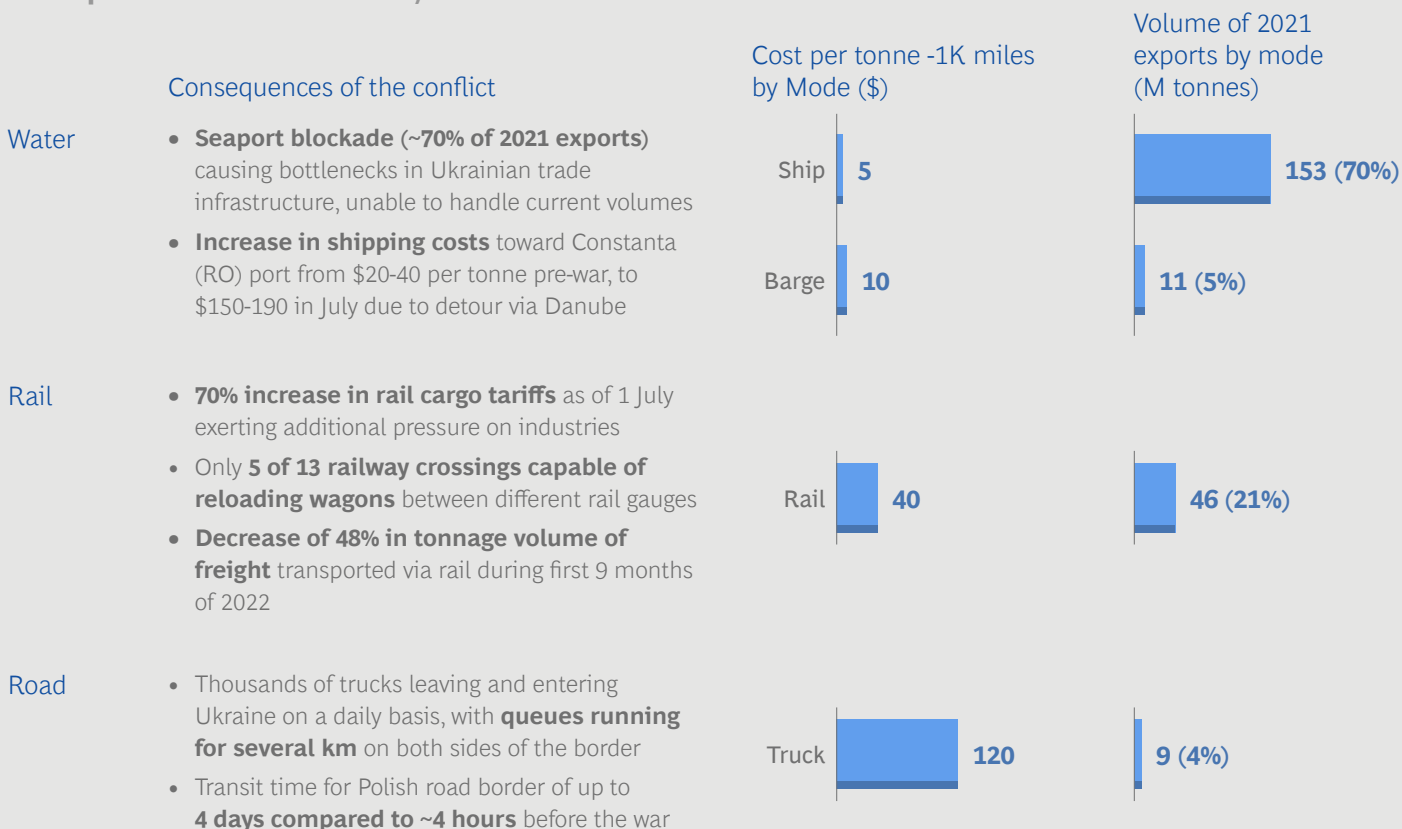
Ukraine's transport network suffered extensive damage in the northern and eastern parts connecting to Russia and Belarus, but remains mostly operational in the rest of the country. Nevertheless, chronic infrastructural issues owing to lack of investments and maintenance are at the origin of existing bottlenecks in the Ukrainian logistics sector. Outdated rolling stock, low quality of roads and railways, and lack of transshipment and border processing capacity are severely hindering the Ukrainian economy, which is no longer able to deliver its products on the international markets following the blockade of its seaports. Quick enablers such as overhauling existing facilities and infrastructure on key routes can provide short-term wins for the Ukrainian economy, and enable it to reach its overarching goals: long-term prosperity and integration into the European network.

Heavy infrastructural damage resulted in about 27% of the rail network and 14% of the road network being affected, as per Ukrainian estimations. The vast majority of damage, however, occurred in the war zones or adjacent areas, and are not of critical importance for Ukraine's present and near-term future.

The major bottleneck stems from the impossibility of resuming maritime shipping, which was responsible for around 70% of pre-war Ukrainian exports. Currently available alternative routes (the Danube and rail and roads toward the EU borders) are overwhelmed, with queues running for several days for both trucks and freight trains stuck at border checkpoints or logistic hubs. The Ukrainian transport crisis is echoing far beyond its borders, with shortages of food, fertilizers, and raw materials being felt all over the world.

Figure 11: Key developments in Ukrainian transport infrastructure

Logarithmic scale of costs per each transport mode; volume of exported goods per transport mode in Ukraine, 2021 data



Source: Ukrainian railways agency, National Institute of Strategic Studies of Ukraine

Exports have thus plummeted and were down by almost 50% y-o-y for the month of July 2022, while transport costs drastically increased (70% surge in rail cargo tariffs as of 1 July, shipping costs to Constanta port increased on average by 70-80% compared to pre-war levels). The resulting situation forced companies rely on foreign trade of goods to reduce or completely stop production, further crippling the Ukrainian economy.

Urgent de-bottlenecking of foreign trade routes is needed in order to resume economic activity and re-employ workers, thus providing a lifeline to Ukrainian businesses.

Enhancements on the full length of the supply chain and across all transportation methods are needed in order to address the current situation and unblock westward trade routes, while ensuring there is enough downstream capacity to handle additional cargo flows in the neighboring countries will also be key.

Newly emerging shifts in trade flows require the rethinking of Ukraine's road infrastructure. Several border checkpoints were already running beyond their maximum capacity before the war and are now completely overwhelmed by the outgoing flows of trade, as queues sometimes amount to more than 1,000 trucks at the border with Poland. Infrastructural overhauls and legislative alignments between Ukraine and its neighboring countries will be key for increasing transport capacity. Further investments are needed for overall improvements of the road network, which scores among the worst in terms of quality and fatality rates (more than twice the European average). Annual losses resulting from car accidents are estimated at around 3–4% of GDP.

Danube trade was only handling about 5% of exports before the war and is currently running at maximum capacity, with hundreds of railcars queuing for unloading at the docks. Limited transshipment and storage capacity, and an outdated trade fleet, are issues that need to be addressed in order to increase throughput. Increasing river transport capacity is key particularly for bulk agricultural or raw material shipments, as the high tonnage and low price per tonne makes transport by rail or truck considerably less profitable.

Ukraine's rail network is among the most extensive in Europe, yet the need of massive overhauls along its whole value chain became ever more obvious after the start of the conflict. Transport volumes started to regain momentum as of the end of summer 2022, yet the volume of transported goods was still well below pre-war levels.

Total volume of transported goods during September 2022 amounted to 11.7 million tonnes, compared to the 28 million tonnes transported during September 2021, while overall volumes for the first nine months of the year were down by 48% compared to 2021.

Internal cargo flows capacity is limited by an obsolete

rolling stock fleet (average degree of depreciation of around 90%; average age of locomotives is more than 40 years), while outdated portions of the rail network and sorting stations further slow down traffic. Low transshipment capacity at the border points and limited bogie exchange capabilities between narrow (1,435 mm) and wide (1,520 mm) rail gauges are proving to be a bottleneck for Ukrainian exports, as the sheer volume of goods is overwhelming the existing infrastructure.

As of August, around 29,000 railcars were still queuing at the Ukrainian borders (although down from 41,000 in July), underlining the need of immediately overhauling existing facilities to unlock the bottleneck at the EU borders.

Even in a scenario where we can take into consideration the permanent reopening of maritime transport routes, shipping will not take place in the same conditions as before the war. Insurers will be charging a higher premium to cover vessels sailing through mine-ridden waters, while ship owners will be wary of sending their cargo ships toward Ukraine instead of other safer destinations. The war with Russia has shifted Ukrainian trade toward a western path for decades to come, and conditions need be put in place to ensure a smooth flow of cargo, which will be at the foundation of a self-sustaining economy.

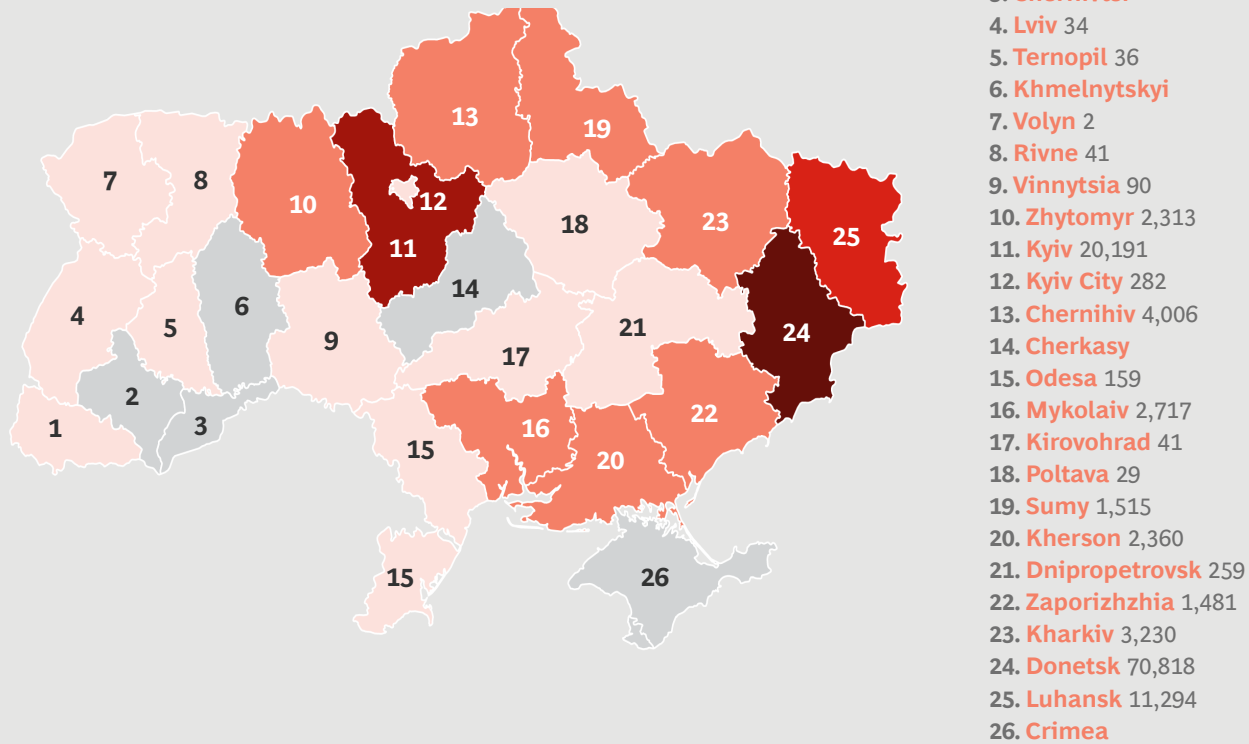
Municipal

Eastern and northern municipalities have been hardest hit by the war, while millions of citizens fleeing from affected areas have amplified pre-existing shortcomings of municipal infrastructure throughout Ukraine. Outdated facilities, low energy efficiency, low quality, and low coverage of heating, water, and wastewater services describe the general state of municipal infrastructure in Ukraine. Extensive investments are needed to improve the level of services for citizens, increase energy efficiency, and thus reduce reliance on natural gas imports. Given the scale of needs, a thorough baselining of current capabilities and population flows is necessary, while upstream support for the government in elaborating a long-term approach is paramount.

Residential war damages were high, with around 150,000 housing units (~7% of total square meters of Ukrainian housing stock) suffering partial or complete destruction since the onset of the war, while less extensive damages were recorded for municipal utilities objects.

Figure 12: Regional distribution of destroyed or damaged housing stock in Ukraine, June 2022 data

Regional distribution by number of destroyed or damaged housing stock buildings



Source: BCG study

Nevertheless, shortcomings in municipal infrastructure were ever present throughout Ukraine, with severe deficiencies in terms of water and wastewater management, municipal heating, and residential energy efficiency.

It is estimated that half of Ukrainian citizens have no access to wastewater disposal systems and one third of wastewater is discharged into water bodies without prior treatment, while less than two-thirds of the population have access to drinking water supply systems. Moreover, energy efficiency for water and wastewater utilities in 2021 was 15–25% below 1996 levels.

The heat supply system is characterized by high inefficiencies in terms of energy usage, with network heat losses estimated at around 20%. Despite only one-third of the households being connected to the district heating systems, the heat supply sector still accounts for half the gas consumption in Ukraine.

Excessive usage of fuel and energy is a characteristic of Ukraine's municipal infrastructure. Most of the buildings date from before 1990 and have not undergone major refurbishments. Thus, the average energy consumption of

buildings approaches 200 kWh/m², almost 50% above averages in countries with a similar climate such as Latvia (140 kWh/m²). The poor use of energy increases reliance on fossil fuels of Russian origin, with natural gas imports rising until 40% of total needs in certain periods.

While it was already clear that at-scale repairs and modernization were highly necessary in the municipal infrastructure sphere, the emerging population shifts toward the central and western parts of the country have done nothing else but amplify pre-existing needs for investments. The estimated 5.9 million people currently displaced in Ukraine have exacerbated municipal infrastructure gaps, as catering to the primary needs of internal refugees in the short term and elaborating an adequate reconstruction strategy on the basis of population flows become paramount.

Fuel

Fuel shortages have crippled the Ukrainian economy since the onset of the war, as the vast majority of petrol products were imported, with most of them coming from Russia and Belarus. Domestic production has been completely

impaired as a result of the conflict, and new supply routes need to be enabled with European partners in order to end the current crisis.

Reliance on foreign petrol products came at a high cost for Ukraine after the onset of the war, as 80% of its fuel demand was satisfied via imports, most of them coming from Russia and Belarus. Additional routes from Lithuania (rail via Belarus), Romania, and Azerbaijan (sea via Odesa) were blocked, leaving Ukraine with only a small portion of its European imports still at hand, while the remaining 20% of pre-war fuel supply was satisfied through local production. However, Ukrainian fuel production capacity was dealt a decisive blow when the sole remaining local producer, Kremenchuk refinery (40% of local petrol and diesel supplies), was taken offline in April following rocket attacks.

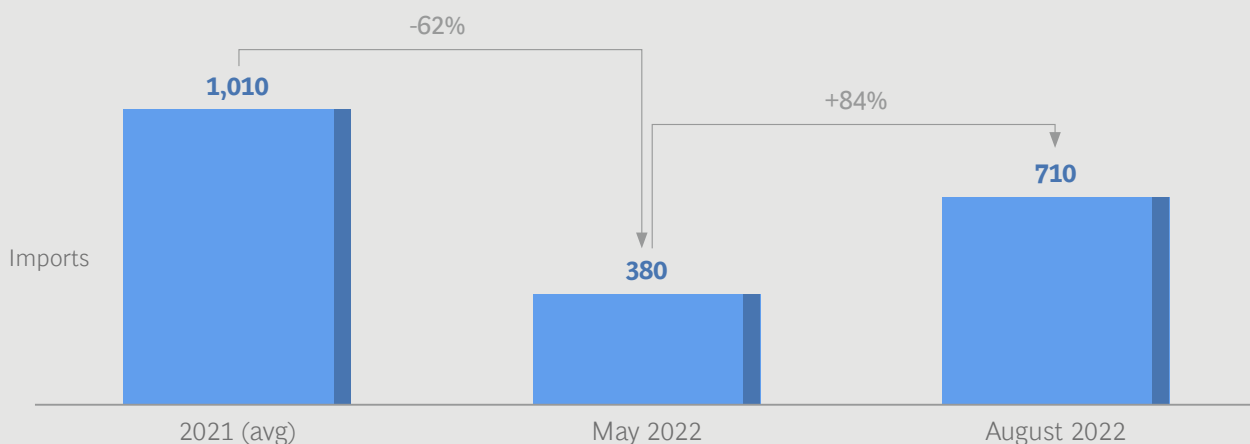
Limited availability of fuel led to hourly-long queues at petrol stations, rations of 10 liters per driver, and price fluctuations of up to 40% compared to pre-war levels.

With an existential crisis at hand, Ukraine appealed to its Western partners, and fuel imports from the EU increased from 10% before the war to 100% as of June. Import of oil products was down by about 62% y-o-y as of May, as neighboring countries made efforts to supply Ukraine with fuel via rail, road, river, and pipeline, and by the end of August imports almost doubled and bounced back to an estimated 710,000 tonnes.

With border queues sometimes extending over several kilometers, de-bottlenecking petrol transport routes will be instrumental in supplying Ukraine with the necessary amounts of fuel. Imports via pipeline or via the Danube could help further increase volumes, ensuring there is enough specialized rolling stock to transport the needed quantities via rail or road will also be a key factor in the fuel supply chain.

Figure 13: Imports of oil products, 2021 average monthly data, May 2022, and August 2022

Monthly oil product imports [kilotonnes]



Source: Ukrainian National Service of Statistics, BCG study

Energy

The energy sector has suffered direct losses due to the war, as key facilities have been either occupied or destroyed by the invaders. Direct damage to energy facilities and the occupation of key areas of Ukraine has prompted national electricity production to fall by almost one-third since the onset of the war, while targeted rocket attacks at the beginning of October have crippled Ukraine's capability to export energy to the EU.

Nuclear energy sources are estimated to have lost close to

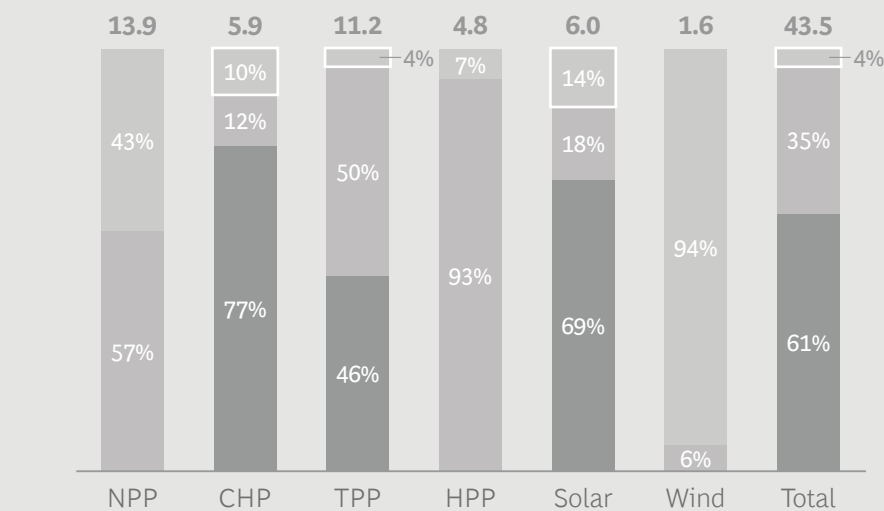
half of their production capacity following the loss of the Zaporizhzhia Nuclear Power Plant, but as remaining facilities ramped up their activity, only a smaller decrease in production has been recorded. Renewable production was even more affected by the war, with production decreasing by 50% as a large proportion of renewable energy source (RES) facilities are installed in regions where active hostilities are taking place.

The decrease in production capacity, however, was met by a comparable decrease in demand, and Ukraine succeeded in maintaining its status of energy exporter.

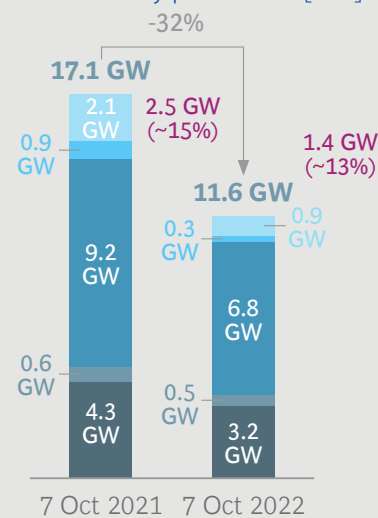
Figure 14: Operational capacity of power generation per source; total electricity production, October 2022 data

Return to levels of energy production specified in the graph only possible once intensified attacks on energy infrastructure are resisted

Distribution of operational capacity of power generation, MW



UA electricity production [GW]



Destroyed capacities
 Capacities in occupied territories and in the active war zone
 Available capacities

Other RES
 Hydro
 Nuclear
 Natural Gas
 Coal

Source: Ukrenergo, The National Council for the Recovery of Ukraine from the Consequences of the War's working group's analysis

Investments are now needed to ramp up production capacity once demand will begin rising towards previous levels, while strengthening the internal grid allowing transport from generators will prompt increases in export. This will not only strengthen Ukrainian resilience, but also benefit importing countries (namely countries of the EU).

The energy sector remains nevertheless plagued by chronic issues related to the inefficient use of energy, as outlined earlier in the diagnosis on municipal infrastructure, by limited domestic energy production and by intensified attacks on energy infrastructure.

Moreover, half of Ukraine's energy infrastructure was destroyed in attacks conducted by Russian forces in autumn 2022. It causes 40% of Ukraine's population to be in immediate humanitarian need. Secondly, the destroyed energy grid infrastructure must be rebuilt with support and assistance of Ukraine's international allies to secure country's independence. The winter months are considered critical.

Investment needs on a 10-year horizon for fostering energy transition and strengthening the energy system are currently estimated at \$100 billion by the NRP.

Summary

While the Russian invasion has caused considerable losses to Ukraine both directly, and indirectly, a wide array of internal and external factors has further amplified the crisis. Chronic shortcomings in municipal infrastructure, an outdated transport infrastructure and global-wide price hikes for fuel and energy in addition to supply chain disruptions have brought parts of the economy to a standstill.

By merging the wide view on Ukrainian socioeconomic dynamics with the granular deep dives into key sectors, a comprehensive image thus crystalizes as interdependencies become visible and economic enablers can be identified.

Given the sheer size of investment needs, a forward-looking and holistic approach is thus required to ensure Ukraine can rebuild on a strong foundation. This entails focusing a limited pool of funds and support toward the most impactful levers, which can ensure a self-supporting economy in the mid-term and a prosperous one in the long run.



Why the recovery in Ukraine needs immediate and bold support

Since the beginning of the Russian invasion, the international environment has been strongly supportive of Ukraine, with help ranging from individual material support to large-scale supranational grants. Not only moral and humanitarian considerations justify the scale of support, but also the fact that Ukraine's economic interest is aligned with the global one of free democracies. As a significant exporter of commodities, Ukraine can enhance global food security and provide valuable minerals, including rare earth metals that are indispensable for technology production and for enabling green transformation. Finally, Ukraine has also traditionally been a net exporter of power and a potential transportation hub for neighboring parts of Europe. Overall, Ukraine is a significant partner on the international scale, strengthened by its candidacy status and future membership to the EU.

1. Geopolitical considerations

Ukraine's recovery is of international concern due to its significant geopolitical influence, owing to economic, trading, and strategic reasons.

A sound recovery would benefit both Ukraine and the EU

as their markets continue to become increasingly integrated. Ukraine already plays a key role on the regional labor markets, with a workforce of around ~1.5 million in Poland and about ~0.5 million in Germany, while it becomes increasingly likely that a substantial portion of nearly 8 million refugees will remain in the EU for the long-term. The recovery plan should consider creating the conditions to enable Ukrainians to access more developed markets and for international investments to improve the local labor market of Ukraine. Such a setup would facilitate best-practice sharing, spreading of know-how, and increased social mobility. Ukraine's access to EU's commercial and financial markets through regulatory convergence will further benefit both parties, as it would significantly smoothen both international trade and labor flows.

Ukraine's position as an economic bridge between Asia and Europe was fully suppressed by the war. Apart from hindering the traditional gas transport route to Europe, Ukraine's position within the Chinese Silk Road Economic Belt has deteriorated as well. Thanks to its coastal span, Ukraine has an excellent position for long-distance sea trade and can fully leverage the benefits of low-cost maritime shipping. However, following Russia's seaport blockade, logistic costs for Ukraine's crucial exports rose

significantly, as rail transport cost per tonne is estimated to be up to eight times higher than it is for deep-sea shipping. The lack of global markets access dealt a severe blow to the Ukrainian economy, particularly to the key agricultural and industrial sectors, where enterprises had to forcefully decrease production due to their inability to store or ship goods.

Bolstering Ukraine’s resilience and enabling its economic recovery would diminish Russia’s possibilities of further escalation, potentially stabilizing the region. With Ukraine heavily dependent on foreign aid (mainly to bridge liquidity issues), de-bottlenecking its economy becomes paramount for safeguarding its sovereignty and thwarting the Russian threat.

2. Ukraine as an important exporter

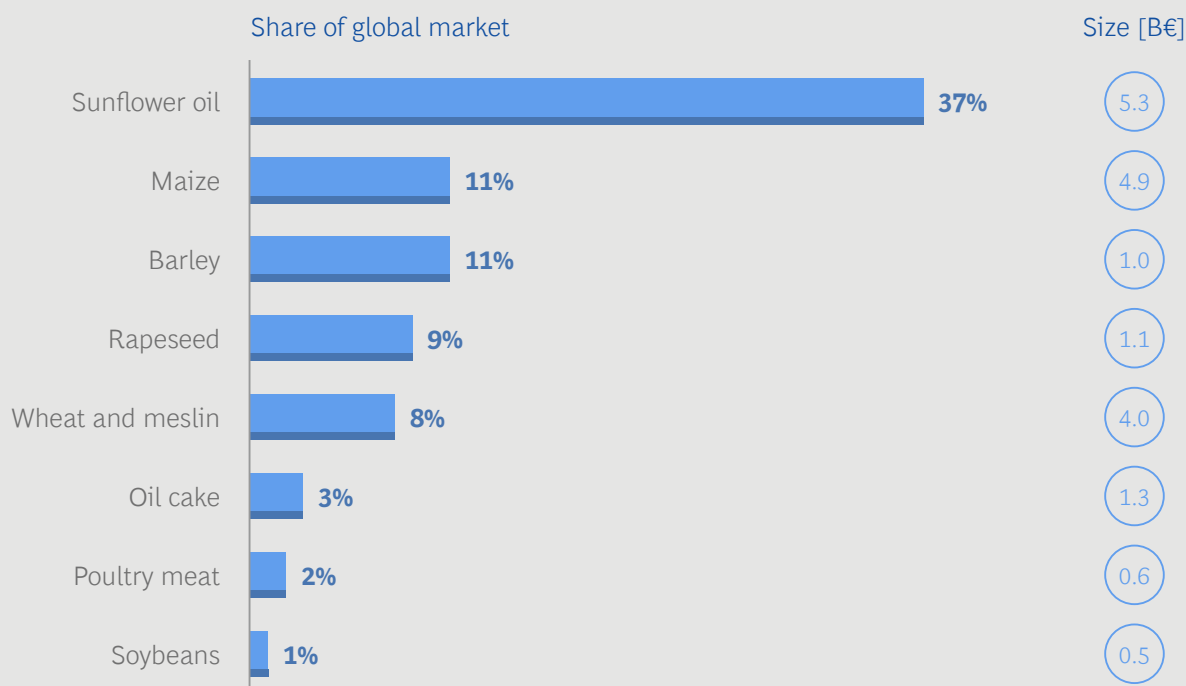
By zooming in on Ukraine’s export statistics, its vital role on international markets becomes evident. The country’s potential revolves around food, minerals, and energy.

2.1 Food

Ukraine’s leading position on the global grain market, combined with its inability to export its products, were at the root of recent worldwide turmoil. Because Ukraine is a key agricultural exporter (see Figure 17²), the seaport blockade was followed by a global-wide increase in food prices. This left the most vulnerable countries exposed and had a major role to play in Sri Lanka’s economic crisis, worsened Afghanistan’s humanitarian crisis, and were at the root of the protests toppling Pakistan’s government.

As David Beasley (executive director of World Food Program, 2022) affirmed: “Ukraine grows enough food to feed 400 million people on planet Earth. There ... will be a supply issue.” One of the recovery goals must be to ensure that the sector receives enough supplies, experiences fewer bottlenecks, and can export freely at last.³

Figure 15: Ukraine’s position on global agricultural market (2021)



2. Source: International Trade Centre, Bank Pekao

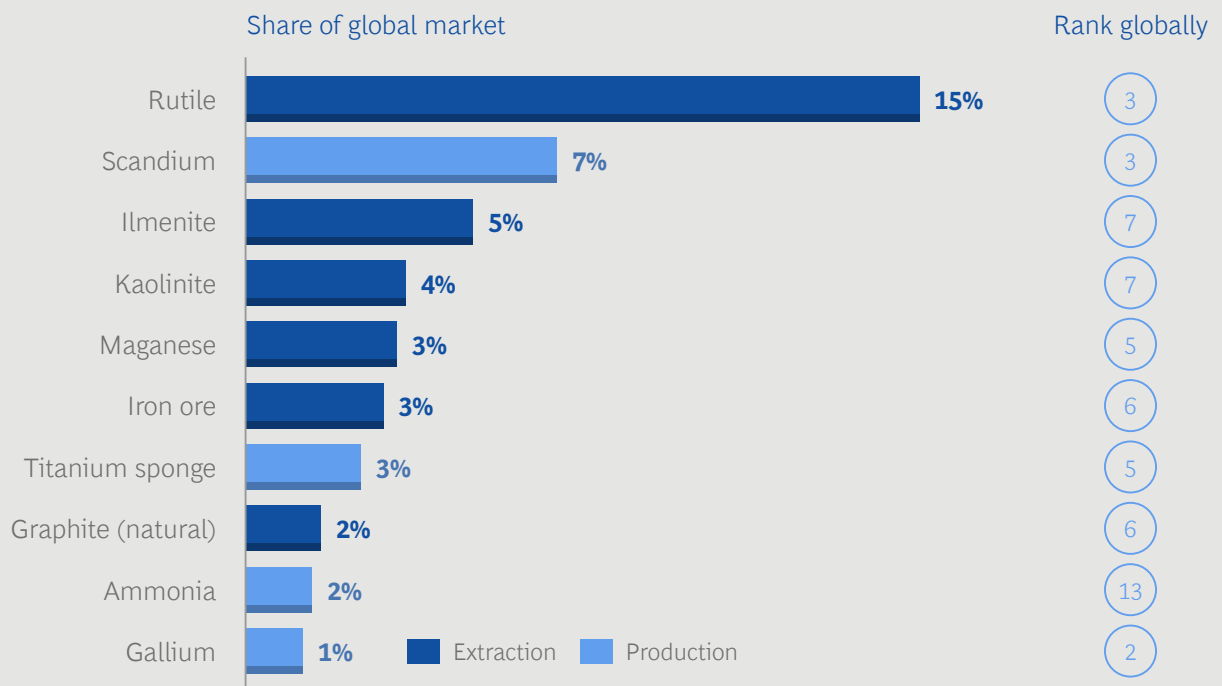
3. Also, assuring sufficient supplies on the global food market supports efforts on taming inflation

2.2 Minerals

Secondly, Ukraine possesses and produces a unique combination of scarce raw materials that are primarily used in strategic and highly specialized industries such as microelectronics, aerospace, climate tech, and construction tech. As these industries are rapidly developing, the importance of Ukraine’s mining output will grow along

with them. Ukraine already ranks among the world’s top 10 producers for over 10 commodities, while it holds a leading position in rutile, scandium, manganese, titanium sponge, and gallium production (see Figure 16⁴). Enabling Ukraine to further develop its specialized mining activities can help alleviate the worldwide dependence on a few concentrated producers (e.g. China, Russia).

Figure 16: Ukraine’s position on the global minerals market (2021)



2.3 Energy

Furthermore, Ukraine has the potential to alleviate the existing energy crisis. Pre-war, Ukraine’s power generation was well-diversified with roughly 30% share each for coal, natural gas, and nuclear, while the share of renewables was growing rapidly. It was on the path to become a European green-energy success story.

Despite the devastating impact the war has had on power production, Ukraine maintains excess capacity. Although its power production capacity decreased by 32% as of 7 October⁵ y-o-y, the demand followed suit, and in June 2022 Ukraine claimed to be capable of exporting ~2.5 GW of energy to Europe. However, in the aftermath of the large-scale missile strikes in October 2022, Ukraine was forced to halt its energy exports and focus on stabilizing its national network. Should Ukraine succeed in maintaining

its excess production capacity, it could play a significant role in lowering Europe’s reliance on Russian energy. Moreover, the Ukrainian reconstruction is also a chance to rebuild its industry and energy production facilities under net-zero emissions standards, enabling convergence toward the Paris Agreement targets.

3. Prioritizing humanitarian aid

The international community needs to rally around helping Ukraine with its humanitarian needs to boost early recovery efforts—including rebuilding housing, maintaining jobs, satisfying basic energy/fuel needs and sustaining the quality of health care, education, and transport, and with providing relief for over 5.9 million Ukrainians displaced by the war.

4. Source: USGS – Mineral Commodity Summaries 2022 (Gallium based on report from 2020), Bank Pekao

5. Comparing 7 October 2021 vs 7 October 2022 (~25% drop of nuclear power production; ~60% drop in renewable production)

The impact of war on the well-being of Ukrainians is dire, with over 61% of the population directly affected by the war, ~5 million jobs lost (close to one-third of total labor market), ~150,000 housing units destroyed, and 25% of families in need of food. Basic logistics and municipal infrastructure in eastern parts have been severely damaged, while the economy and the level of prices across the whole country remain largely unstable. Therefore, a full-fledged recovery is key for satisfying the urgent humanitarian needs and for alleviating the impact of war hostilities.

In addition, the recovery is also an opportunity to elevate local living standards in the mid- to long-term through both:

- a. Channeling investments towards projects such as clean & wastewater management, and
- b. Improving the building blocks of a functioning society such as ensuring efficient procurement processes or lowering corruption

A timely recovery would allow for restarting the economic reforms and re-embarking on the path toward a prosperous and sovereign state. This would create the conditions for stability and predictability within the economy, supporting Ukrainian convergence toward European living standards.

Humanitarian aspects must remain a priority for the international community, as thoughtful financial structuring needs to be combined with prompt actions in order to ensure minimal basic services for a population in dire need.

Conclusion

The Ukrainian recovery is a daunting and complex task that requires exceptional effort on a national, regional and international level. Early actions need to go hand in hand with thorough planning.

Therefore, in order to ensure the adequacy of planned recovery measures and assure their proper understanding by the stakeholders, the Rapid Damage and Needs Assessment (RDNA) is being regularly updated by the Ukrainian Government, the European Commission, the United Nations and the World Bank, with the next update expected very shortly. While the RDNA focuses on direct damages, and is an excellent tool to aid the rebuilding of Ukraine, it is also clear that the impact of the war in Ukraine extends far beyond the national level, and is also a global concern.

Acknowledging the full breadth of the significance behind the Ukrainian recovery will be key when designing recovery-related actions and ensuring full involvement of the concerned stakeholders.


As seen from the geopolitical, export, and humanitarian vantage points, a stable and prosperous Ukraine can benefit and have a multiplier effect on economies from all over the world.

Suggested principles to help Ukraine

Having compiled a very detailed, holistic picture of the situation in Ukraine, BCG and EIB have identified key pressing issues. We jointly suggest following six key principles when approaching the Ukrainian recovery

strategy. Aligning on these values will be crucial for facilitating coordination of the Western response.


01



Supporting Ukraine—
starting now

International financial institutions need to double down their efforts more than ever and further their investment in Ukraine despite the ongoing war. While remaining in line with their mission and mandates, international donors could initially focus on western regions free of hostilities, where most of the economic activity has now shifted, followed by support of liberated areas in eastern parts of the country in close cooperation with local authorities). Critical investments in the east can be carried out after close consultations with the Ukrainian government, while remaining mindful of war risks.

02



Bolstering Ukraine's
resilience

The survival of Ukraine as a sovereign state is a prerequisite for future recovery and long-term modernization. A concerted effort is needed not only with the involvement of financial institutions, but also from the international community as a whole. Ensuring the short-term resilience and functioning of Ukraine as an independent and democratic state is the first step in its endeavor toward long-term recovery.

03



Focusing on key topics
for maximum impact

Investment focus needs to be aimed at key areas and enablers that can catalyze economic recovery. As investment needs far outweigh availability of funds, international financial institutions need to identify and focus on the most impactful investments that can de-bottleneck the Ukrainian economy and have the potential to lay the foundations of self-sustainability in the long-term.

04



Facilitating EU integration

Following recent developments, it has become ever clearer that the future of Ukraine is now tied to integration with other democracies, especially with those closest geographically to Ukraine. Facilitating closer cooperation and integration with the EU is a net gain not only for Ukraine and Europe, but also for the entire democratic world, as it stabilizes the region and vital global trade dependencies.

05



Ensuring UA ownership and accountability

It is paramount that ownership for the reconstruction effort lies on the side of Ukraine, as this strengthens Ukrainian sovereignty, resiliency, and accountability. While international organizations will need to advise, seek alignment, and ensure monitoring and transparency, ultimate accountability will be on the side of Ukraine, which will have to become independent from international aid at some point after peace is ensured.

06



Ensuring alignment with other international organizations

As multiple organizations are involved in Ukraine, communication and cooperation are key for generating the maximum potential impact. IFIs should channel their efforts where they can bring the most value, building on successful past investments in Ukraine and their core expertise. Through strategic coordination, IFIs can align efforts among each other and complement their offerings to provide Ukraine with comprehensive and holistic aid. There is high potential of IFIs joint participation in the overarching Ukraine support framework, tightening existing partnerships and forging new ones while joining any forming international coordination efforts.

The presented principles lay the foundation for the prioritization of initiatives described in later sections and are meant to provide overarching guidance for investment in Ukraine in the foreseeable future. They are seen as key pillars in forging the Ukraine Recovery Strategies.



Coordination on Ukrainian reconstruction

Ukraine reconstruction and development efforts, because of the damages caused by the war, will require full dedication and joint efforts of all engaged parties from both within and outside of the EU.

From the IFIs' perspective, a successful implementation and maximization of impact on Ukraine is directly dependent on the strategic coordination of the recovery efforts, especially between EIB, the World Bank, and European Bank for Reconstruction and Development, as well as other international financial institutions (KfW, JICA, etc.). Sharing knowledge, joining capabilities and skills as well as having clearly stated roles within the reconstruction framework, in line with the expertise and experience of each IFI in Ukraine is vital.

It is recommended that all engaged IFIs, in a joint session dedicated to operations in Ukraine, split their roles and set up terms of their cooperation before any action is taken, to avoid redundant misconceptions. Additionally, the timeline of projects implementation should be established.

The RACI framework could be used to establish roles between engaged IFIs. The framework helps to structure and identify responsible, accountable, consulted, and

informed parties in every process of every project that is planned and then implemented.

Prioritization of efforts in Ukraine

Needs for Ukraine's recovery were assessed by the National Recovery Council (NRC). The NRC was established by the Ukrainian government as an advisory body to the president, Volodymyr Zelensky. One of the main roles of the NRC was to create the Post-War Recovery and Development Plan for Ukraine—Ukraine's Recovery Plan (UNRP), published on 6 July 2022.

The initiatives defined by the National Recovery Council include projects across multiple sectors and different time horizons as well as estimated funding needs. However, the plan doesn't consider the prioritization of the initiatives, which would allow to translate the UNRP into actionable programs, with a defined timeline.

Therefore, EIB and BCG initiated the analysis of all projects defined by the Ukrainian National Recovery Council, in an attempt to set priorities and group the initiatives into programs that can later be translated into a strategy.

ADDED INITIATIVES

BCG team analyzed the UNRP plan after completing the diagnosis of the situation in Ukraine.

To ensure completeness of the UNRP document, BCG proposed adding 15 new initiatives. The initiatives relate to the economic and social environment sector, infrastructure, and energy & environment. The additional initiatives were carefully defined based on multiple interactions with (i) EIB teams; (ii) external experts

specialized in Ukrainian economy, infrastructure, energy; (iii) public-sector BCG experts experienced among others in EU institutions, cooperation with IFIs (WB, EBRD), and all relevant sectors of economy. Over 60 key experts were engaged in constructing the additional initiatives.

These were later assessed in the assessment framework using the same criteria as for all other initiatives. Please see the added initiative list in the table below.

Project description	Funding need (\$B)	Time horizon
De-bottleneck traffic along main internal routes by increasing road capacity in accordance with existing population flows	15	Short-term
Improve road conditions focusing on increasing capacity and safety measures	12.5	Mid-term
Expand logistic energy bottlenecks that emerged due to the conflict (e.g., increase grid capacity of old grids or generators)	10	Short-term
Explore energy efficiency (e.g., reconstruction of old grids or generators)	5	Long-term
Invest in projects focused on decarbonization of existing plants (e.g., carbon capture technologies to lower emissions from TPPs & CHPs)	3	Mid-term
De-risk commercial lending through guarantees for banks and other lenders to support investment (e.g., infrastructure lending, SMEs, corporations, FDIs)	2.5	Mid-term
De-risk private lending through guarantees for mortgages (given by banks) to support investment in residential projects	2	Mid-term
Support export enablement initiatives (e.g., through loans, trade financing, guarantees)	1.5	Mid-term
Invest in forestry—sustainable management and reforestation	1.5	Long-term
Finance next year's harvest (seeds, fertilizer, fuel)	1.5	Short-term
Strengthen digital infrastructure (e.g., rebuilding affected cell towers, implementing digital monitoring in road and rail, etc.)	1	Mid-term
Fund public service facilities in areas with increased population (schools, health care facilities)	1	Short-term
Fund initiatives to support relocation, restart, reconversion initiatives (through loans and guarantees for investment and working capital)	1	Short-term
Finance alternative grain storage solutions for upcoming harvest (not necessarily at border)	0.5	Short-term
Improve cross-border infrastructure on EU side	0.1	Short-term

NEEDS ASSESSMENT

To understand the urgency and impact of all initiatives and translate them into actionable projects, a custom-tailored

assessment framework was created following expert consultations, which considered a wide array of both qualitative and quantitative aspects of Ukrainian needs.

Figure 17: Assessment framework building blocks

Ukraine needs



Strategic dimensions

Implementational dimensions

Feasibility

War-time risk

Societal dimensions

Innovation impact

Climate change impact

Health care impact

Educational impact

Humanitarian impact

Resilience



Economic dimensions

GDP impact

Employment impact

De-bottlenecking the economy

Expert assessment based on description and scope of initiatives

Quantitative assessment of the estimated relative power of initiatives to contribute to growth in GDP and jobs

A list of multiple criteria was created:

Assessment framework criterion	Criteria type	Definition
Employment impact (jobs created)	Quantitative	Additional jobs per unit of monetary investment generated by the initiative
GDP impact	Quantitative	Additional GDP per unit of monetary investment generated by the initiative

De-bottlenecking of the economy	Quantitative	Extent to which the initiative would address challenges hindering the economy since the onset of the conflict
Feasibility	Quantitative	Implementation complexity and capacity requirements; including probability to fail/not fully deliver
War-time risk	Quantitative	Risk of the effects of the initiative being damaged by military activity
Innovation impact	Quantitative	To what extent the initiative supports innovation in UA (product innovation—improvements in a product or social offering; social innovation—new ways of doing things to meet social needs; or process innovation—changes and improvements in production and delivery methods)?
Climate change impact	Quantitative	To what extent will the initiative (positively or negatively) impact climate change issues in UA or globally? Can be measured in additional GHG emissions emitted (or saved) because of the project
Health care impact	Quantitative	To what extent will the initiative impact the healthcare system in UA (in terms of access—number of beneficiaries and procedures; outcomes/quality of services—results of medical procedures, patient satisfaction; health care awareness/ preventative care; affordability of healthcare)?
Educational impact	Quantitative	To what extent will the initiative improve education in UA (in terms of access, outcomes—knowledge, skills developed, quality of processes)?
Humanitarian impact (food, shelter, first aid)	Quantitative	To what extent will this initiative bring humanitarian help to war victims (in terms of food, shelter, first aid)?
Resilience	Quantitative	To what extent does this initiative strengthen the resilience (economical, geopolitical, military) of UA and help it withstand the ongoing conflict?

All initiatives that were eventually considered were assessed using a dedicated methodology based on previous experience in countrywide reconstruction initiatives.

The scoring system was based on the analysis of economic quantitative impact and expert strategic judgment. The logic of the assessment was based on the following steps:

- Every initiative was given a score (1–10) against all criteria.
- Depending on the time horizon of the initiative, a weight for each criterion was applied.
- The sum of the weighted scores was the final score of the initiatives.
- The total score (in a range 1–10) indicates the relative impact of the initiative.

Furthermore, every criterion was assigned a time horizon weight, based on the reconstruction needs. Some of the needs (for example war-time risk) are more significant in the short-term, while other (for example climate change) in

the long-term. Every project in the UNRP had a start and end date defined. The assessment framework took that into consideration and grouped initiatives into three time horizons:

- Short-term (2022–2023)
- Mid-term (2024–2027)
- Long-term (2028–2032)

In the coming 12 to 15 months, it is critical to focus on humanitarian needs (first aid, shelter, food), economic and geopolitical resilience, and de-bottlenecking of the economy.

In the mid-term perspective, main focus shifts toward GDP and employment creation, followed by continued efforts to de-bottleneck the economy and strengthen Ukraine’s resilience.

By 2032, the majority of projects would be dedicated to further economic growth.

In the short-term (2022–2023) the estimated funds needed

are ~\$110 billion, spread across ~30 projects. Mid-term recovery assumes to be spread over 2024–2027, where the required funds double (~\$210 billion, ~60 projects). In the long-term, until 2032, the funds are estimated at ~\$500 billion (80–90 projects).

Study on prioritization of support

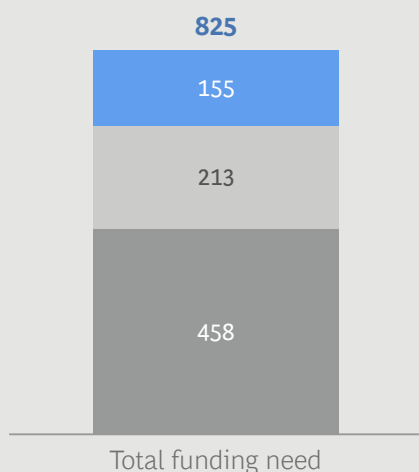
PRIORITIZED INITIATIVES

The assessment framework (detailed in the previous chapter) was applied to all initiatives brought forth in the UNRP and proposed by BCG, following consultations with Ukrainian experts and industry experts.

The analysis divided the already well-chosen initiatives into three impact categories, the top ~\$150 billion being ranked as high priority based on estimated potential financing in the next 10 years.

Figure 18: Distribution of funding needs by assessed impact and time horizon

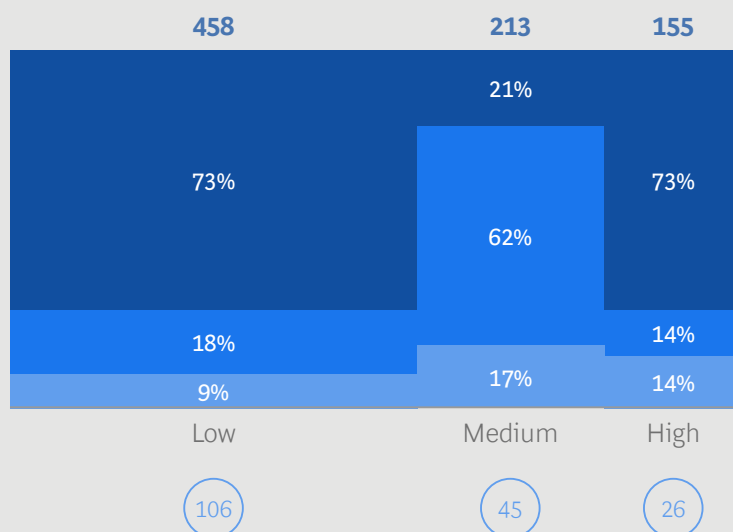
Funding size (\$B)



Out of total ~\$825B funding need, ~\$150B selected as high impact (with \$50B as a backup)

■ High impact ■ Mid impact
■ Low impact

Funding need value by impact potential (\$B)



High potential—initiatives with highest score of cumulative value up to \$150B funding need

■ Short-term urgent needs ■ Long-term modernization
■ Mid-term recovery

Note: Projects qualified as high-, mid-, low-potential based on their score and their cumulative funding size: high (up to \$150B), mid (\$170B–\$400B), low (>\$400B). Time horizons qualified based on NRC timeline: short-term urgent needs (2022–2023), mid-term recovery (2023–2027), long-term modernization (by 2032). **Source:** NRC Recovery Plan, BCG analysis

The highest impact initiatives are listed below.

(1 being the highest ranked, 26 being the lowest ranked among the assessed initiatives)

Top 26 Ukraine needs for ~\$150B:

Rank	Initiative	Needs (\$B)
0	Facilitate UA government stability with macro-financing	
1	Support export-enablement initiatives (e.g., through loans, trade financing, guarantees)	1.5
2	Introduce wartime government grants, loan guarantees, and interest rate reduction	5
3	Reparation and modernization of sorting stations on key routes (particularly export ones)	0.2
4	Oil, oil-products emergency stock for 30+ days	1.2
5	Assess scope for deregulation through running Red Tape reduction program with crowdsourcing of ideas and optimized process of regulations review, establishing systematic regulatory burden measurement and regulatory impact analysis of draft laws and regulations	0.1
6	Construction of EU cross-border agricultural storages and terminals	0.2
7	Strive for EU integration, incl. ensure synchronization of Ukraine regulation with Copenhagen criteria, secure access to markets	0.1
8	Finance next year's harvest (seeds, fertilizer, fuel)	1.5
9	Increase labor mobility through (a) funding the transfer to other regions for job purposes, (b) simplifying regulations for foreigners' employment in Ukraine and Ukrainians' employment abroad	0.3
10	Modernize water and wastewater management system	42
11	De-risk commercial lending through guarantees for banks and other lenders to support investment (e.g., infrastructure lending, SMEs, corporations, FDIs)	2.5
12	Construction of 200 km of 1,435 mm rail and 330 km of 1,520 mm rail to the EU border and Danube	1.4
13	Establish procurement practices for Reconstruction projects fully aligned with EU directives and guidelines	0.1
14	Expand the functions and mandate of Investment Promotion Agency to proactively solicit FDIs for Reconstruction investment projects	0.1
15	Modernization of 12 existing EU road border points and construction of three additional ones	0.1
16	Improve cross-border infrastructure on EU side	0.1
17	Maintenance of 20+ freight car relocation equipment from 1,520 to 1,435 mm rail track	0.1
18	Fund initiatives to support relocation, restart, reconversion initiatives (through loans and guarantees for investment and working capital)	1
19	Expand logistic energy bottlenecks that emerged due to the conflict (e.g., increase grid capacity of old grids or generators)	10
20	Professional Armed Forces of Ukraine, other components of the defense forces	out of scope ⁶

6. Out of this study's scope. Generally a key initiative

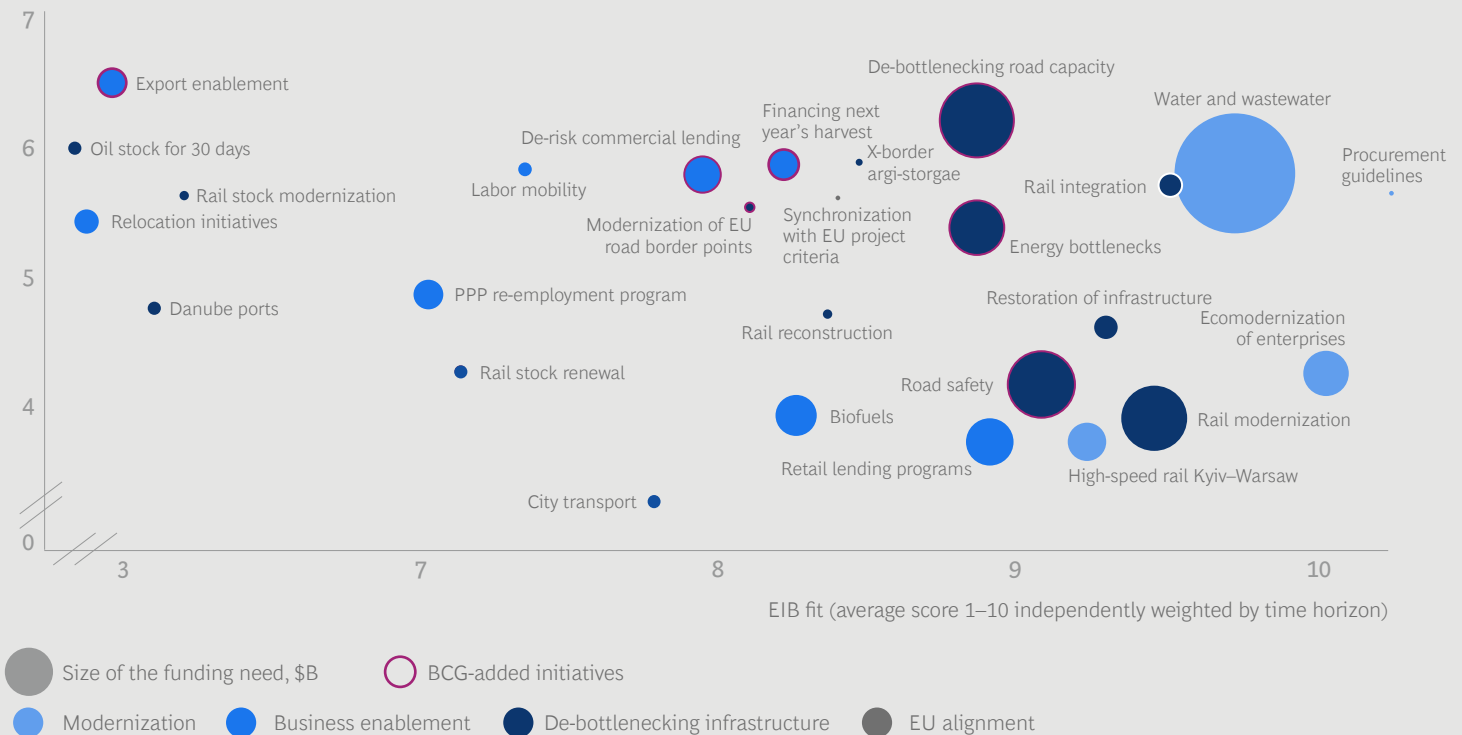
21	Comprehensive rearmament of the defense forces	out of scope
22	Further develop Diia.Business as a one-stop shop and key repository of information for SMEs	0.1
23	Establishment of the Defense Technology Agency and Defense accelerator (Diia Tech & Defense)	0.5
24	Secure macro-financial stability: ensure stability of budget deficit and banking system while maintaining healthy debt level	70
25	Launch PPP re-employment program with reskilling part (physical and financial infrastructure, employers funding matching), up to 1 M people coverage	1.5
26	De-bottleneck traffic along main internal routes by increasing road capacity in accordance with existing population flows	15

The chart below focuses on highest-ranked Ukraine needs. The priorities are non-exhaustive and there could emerge other topics and investment initiatives beyond the below.

Figure 19: Zoom on top ~\$80B high-impact initiatives

Ukraine need and potential impact (average score 1–10 independently weighted by time horizon)

Ukraine need & potential impact (average score 1-10 independently weighted by time horizon)



ENABLERS

For Ukraine to recover, cooperation with international partners will be a necessity—the EU being the closest, biggest, and strongest one. The cooperation will amplify cross-border flows of goods and increase workforce mobility and cooperation. For both to be successful, Ukraine needs to align with the EU on the regulatory level.

- **EU alignment:** two of the initiatives were prioritized to enable EU alignment:
 - *5.9. Establish procurement practices for reconstruction projects fully aligned with EU directives and guidelines*
 - *2.A.1 Strive for EU integration, incl. ensure synchronization of Ukraine regulation with Copenhagen criteria, secure access to markets.*
- **Social and humanitarian support:** A certain percentage (10%–25%) of funds will be opportunistic on enablers.

CAPACITY TO ABSORB FUNDING

Enormous financing needs and international donors' willingness to provide ample support generate an immediate need to assess Ukraine's additional debt absorption capacity, which might be limited by the financial capacity to service it or the technical ability to process and implement projects.

Financial absorption capacity can be assessed by understanding the maximum levels of debt Ukraine can sustain and possibility to return to capital markets

With 2022 GDP contraction estimated at ~30%, the Debt/GDP ratio is forecasted to reach ~90% by the end of Q4. Even recovering Ukraine's GDP to the 2020 level and allowing the Debt/GDP ratio to approach 100% would only cover less than \$100 billion in additional debt, while the figures of estimated needs (~\$750 billion according to the NRP) would still dwarf those of the contracted debt.⁷

Moreover, as the war severely obliterated Ukraine's financial health, its debt fundamentals deteriorated, preventing it from borrowing from traditional financial markets. This makes meeting its financing needs dependent on either domestically issued war bonds or internationally subsidized loans/grants (responsible for ~50% of state budget since the beginning of the war). Even if Ukraine was able to borrow at 6% (subsidized rate in \$ or €) and would decide to double its government deficit, it could only serve additional ~\$125 billion while maintaining liquidity.

Technical capacity to absorb additional debt depends on several factors. The first constraint relates to the

institutional capacity—the ability to screen and monitor beneficiaries, procure efficiently, and implement reforms. Second—Ukraine might need to import technical expertise for areas where it is lacked it domestically. Third—Ukraine's construction sector's capacity to implement new projects needs to be analyzed, as potential labor and materials shortages could hinder the absorption of the international donors' funds.

While Ukraine is facing unprecedented financing needs, the international community is willing to undertake a concerted effort and support its recovery. It is paramount that donors' ambitions are met by proportional Ukrainian capacity to manage and absorb the additional debt, with a creative financing structure and efficient stakeholder cooperation as imperatives for success.

7. Source: Current debt at \$93B (2022 Q2, Ministry of Finance of Ukraine).



Recommendations

The vast amounts of reconstruction needs require certain adaptations to be made, which would increase beneficiary absorption capacity and smoothen the overall lending process. Lending experience in Ukraine allows to identify several levers which could, if correctly implemented, have the potential to significantly improve end results:

- Establishing **holistic country-level reconstruction strategies** for paramount areas and aligning promoters and stakeholders across sectors will be key for ensuring that the currently limited funding supply is channeled toward areas of maximum impact and will remain relevant in the long-term. Distribution of funds needs to be adapted to emerging population and economic flows while also taking into account absorption and implementation capacity of the end receivers.
- **Providing loans directly to the beneficiary under a state guarantee** can significantly improve distribution flows while also increasing ownership of end receivers. Every lending process should be supported by the granting IFIs, as past experience has shown that granting funds via the state budget can slow down the lending process due to the involvement of additional intermediaries and legislative procedures.
- Dispersed procurement procedures have consistently proven to be a bottleneck in the lending cycle.
- Organizing the **acquisition procedure through a simpler procurement process** heavily supported by the lending IFIs, particularly for mass-purchases of machinery or materials.
- It could allow for the swifter implementation of sub-projects under the umbrella of programmes.
- Alignment between Ukraine and IFIs will be essential in ensuring swift project implementation. **Establishing and training project implementation units** at the promoter level will lay the foundations for an efficient long-term collaboration between Ukraine and IFIs, as well as further convergence with the EU, that will create space for strategic enablement and economies of scale (including technical assistance and monitoring synergies). IFIs can thus engage in collaborations within their areas of expertise and forge a common approach toward the reconstruction of Ukraine. The overall funding could be split across the key programs and enablers.





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