

Building economic resilience for an uncertain future:

lessons from Ukraine for governments and international
financial institutions

Foreword: Key Principles for future Ukraine

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The future economy can be examined through the lens of objective factors that shape the quantitative and qualitative characteristics of the future economic order and determine the content and tools of economic policy.

Resilience as an imperative. Today, the resilience of an economic system is defined as the capacity to withstand (absorb) economic and natural shocks with minimal losses (shock resistance), the capacity and speed to return to pre-crisis levels of socioeconomic well-being (post-shock recovery capacity), and the ability to adapt to operating under new conditions in the medium and long term (adaptability).

Transition to green economy. In practice, this means that environmental awareness must become an unconditional baseline social value, requiring a reassessment of established views on social progress and economic development — in particular, a revision of indicators of economic growth and well-being. Such a transition is a prerequisite of EU membership.

Ukraine in fact will move to a circular economy model, that means rebuilding production and infrastructure on the basis of resource efficiency, reuse, repair, and recycling, in order to reduce waste, lower import dependence, and support long-term economic resilience. Such a transition is a prerequisite of EU membership.

Inclusiveness as a principle of future Ukrainian economy. It means that post war economic recovery and long-term economic development should benefit all citizens, ensure equal access to opportunities, and reduce social, regional, and economic inequalities.

Electronic money as an integral component of the economy of the future. In 2008, with the advent of Bitcoin, a new era began in the development of payments using cryptocurrencies. Although they are not yet as widely used as official money and currently operate in parallel with it, their role may grow substantially in the future, making them a competitive substitute for traditional money issued by a central bank. Central banks are today working on the issuance of central bank digital currencies — a digital form of a country's fiat currency that also constitutes a claim on the central bank. It is clear that these innovations will change the face of the national monetary system.

Ukraine has already started to develop regulations that affect the trade, storage and issuance of cryptoassets and since 2021 the National Bank works on introducing E-hryvnia as an electronic form of the monetary unit of Ukraine.

The industry of the future. Industrialization has traditionally been viewed through the lens of job creation, technology development, innovation and income growth. While the "traditional" model of industrial development is significantly changing driven by the green transition, the new technologies and new types of production emerge. New industrial revolution will be fundamentally transforming the life of society.

The industry of the future will be resilient: firms will pay attention to ensuring redundancy, flexible supply chains, and shock resistance alongside cost competitiveness. Green and low-carbon production will become a core industrial standard. Industrial competitiveness will depend on energy efficiency, decarbonization, and compliance with environmental regulations. Digitalization and AI will transform manufacturing dramatically.

Given Ukraine's future EU membership, Ukraine will implement the EU's industrial policy aimed at strengthening the competitiveness of European industry, economic resilience and digitalization, and job creation as envisaged by A New Industrial Strategy for Europe (European Commission, 2020).

Labor market — qualitative changes. The future labor market will be shaped by technological and demographic changes, fragmentation of global economic ties, the green transition, international conflicts, and more.

Given the growing speed and scale of both the transformation and displacement of traditional occupations and skills, as well as the emergence of demand for new professions and competencies, the level of qualifications and the content of professional skills in the future will be determined not so much by the volume of "technical" knowledge, but primarily by the presence of soft skills and the ability to adapt to rapidly changing requirements.

It means that Ukraine's labour market will not simply "recover" to its pre-war structure. It will be reshaped by a combination of demographic loss, wartime mobilisation, displacement, emigration, regional relocation of business activity, and accelerating technological change. In fact Ukraine will have to deal with the situation when the labor market will be a strategic production constraint for reconstruction, industrial policy, and long-term growth.

In demographic terms Ukraine is likely to face a smaller working-age population due to war losses, outward migration, lower birth rates, and population and intensive process of aging. Trend to more female-centred labour market will persist. This will increase the importance of childcare, flexible work, retraining, and policies supporting higher female labour-force participation. Return migration will be selective, not automatic. Many Ukrainians abroad may return only if security, housing, schooling, healthcare, and job conditions improve together.

For Ukraine reconstruction and industrial renewal will require engineers, technicians, welders, machine operators, electricians, construction workers, logistics specialists, and energy-sector professionals. If Ukraine's future growth model will be based on miltech, machinery, critical materials processing, energy resilience, and industrial upgrading, demand will grow for mechatronics, electronics, robotics, maintenance, precision manufacturing, cybersecurity, and applied engineering.

Taking into account these and other circumstances Ukraine has to elaborate adequate labor, migration and educational policies to develop modern and efficient labor market.

New business models and business process management systems. The emergence of artificial intelligence (AI) has become an important driver of business process transformation today. Artificial intelligence is used to improve the efficiency of standard management operations, introduce organizational innovations, develop strategies, and strengthen competitive positions in the market.

In the future, the organizational foundation of business models is expected to be autonomous AI agents, that is, systems capable of planning, executing multi-step tasks, and operating with minimal human involvement. In essence, this refers to qualitatively new systems for automating customer service, data analysis, software development, logistics optimization, and other functions whose implementation previously required intensive human involvement.

Over the past 10 years, the IT industry of Ukraine in general and AI segment has been actively growing. However, a full-scale war and war related factors, active migration of specialists abroad etc. negatively affected AI development. At the same time since the beginning of the full-scale invasion, the number of defense tech startups using AI solutions has increased significantly.

In fact AI usage is not limited to defense industry. Cyber security, medicine, agriculture and education in Ukraine are priority sectors for AI usage.

Despite financial constraints, loss of talent and the need to transform education, the AI industry in Ukraine has a great potential and can become not only a driver of the country's innovative development but an important global IT player.

RRR4U (Resilience, Reconstruction and Relief for Ukraine) is a consortium of four Ukrainian analytical organizations: DiXi Group, Institute for Analytics and Advocacy, Institute for Economic Research and Policy Consulting, and Center for Economic Strategy.

RRR4U publishes monthly and quarterly reports on Ukraine's progress in meeting the conditions of key EU and IMF financial assistance programs. All reports are available [here](#).

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Executive Summary

Many of the assumptions that shaped economic policymaking over the past three decades have become less reliable. Open trade, predictable supply chains, stable security conditions, affordable energy and readily available financing can no longer be taken for granted.

The purpose of this report is not to argue against the economic model that delivered unprecedented prosperity and global integration. Rather, it is to examine how governments, businesses and international financial institutions can make that model robust enough to survive the conditions that are emerging.

Ukraine provides a useful case study. Since 2022, the country has experienced simultaneously many of the pressures that are increasingly affecting economies around the world: disruptions to trade and logistics, attacks on critical infrastructure, fiscal constraints, labour shortages, energy insecurity, investment risk and growing security concerns under the conditions of high uncertainty. While the scale is exceptional, the underlying challenges are not unique.

The first section of the report examines how the global economic environment is changing. The fragmentation of trade, the growing role of economic security in policy decisions, pressures on fiscal frameworks are the new reality, and the role of international financial institutions must evolve to keep up with it.

Ukraine's experience shows that in a world of permanent shocks, governance must be not only strong and efficient, but also adaptive, flexible, and credible. The full-scale war demonstrated that institutional resilience depends on the ability to preserve core state functions, maintain public trust, and adjust rules and procedures rapidly under extreme pressure. At the same time, crisis governance creates risks of excessive centralisation, weaker accountability, and democratic backsliding, making safeguards and oversight essential. Ukraine therefore offers an important lesson for other countries and international partners: resilience should be built into governance systems before the next shock arrives.

The third block analyses strategic infrastructure and growth sectors - energy, logistics, critical minerals, defence/dual-use. The infrastructure investment is increasingly linked not only to growth, but also to resilience, security and competitiveness. Crucial is the development of redundant energy systems and logistics networks, where Ukraine's experience provides practical lessons on resilience, recovery and adaptation.

The final part considers the implications for international financial institutions. It argues that development finance is increasingly shifting from traditional project lending towards investment enablement through guarantees, insurance mechanisms, blended finance and other risk-sharing instruments.

The report identifies five practical lessons: resilience requires redundancy; emergency flexibility must be paired with safeguards; infrastructure should be financed as a system rather than as isolated assets; strategic sectors require value-chain finance; and IFIs need to move from risk avoidance to risk sharing.

For Ukraine, the implication is that reconstruction should strengthen long-term competitiveness rather than only replace damaged assets. For governments, investors and international financial institutions, the broader lesson is that preserving the benefits of an open and integrated global economy increasingly requires institutions, infrastructure and financing models that are robust enough to operate under greater uncertainty.

What holds and what folds: which old assumptions are breaking?

Centre for Economic Strategy

For decades, economic policymaking in the West operated on a relatively stable set of consensus premises: free trade is net positive, fiscal discipline is non-negotiable, commodity markets self-correct, and IFIs can handle crises within the existing toolkit. These premises have been slowly undermined by autocracies around the world. Russian full-scale invasion of Ukraine was the watershed moment for many democracies. Now, all these premises are rapidly failing at the same time. Ukraine, living inside this failure since 2022, offers a clear view of what comes next and how to adapt.

The trade architecture is fragmenting.

The rules-based multilateral trading system is in retreat. Between mid-2024 and mid-2025, new tariffs and trade-restrictive measures covered over USD 2.6 trillion in global imports. This is more than four times the previous year's figure, the highest level in over fifteen years of WTO monitoring. The US has weaponised tariffs as a primary policy instrument; the EU and China respond with their own industrial subsidies and export controls. Sanctions regimes have become systemic features of international trade. The WTO's dispute settlement mechanism has become effectively non-functional. Moreover, the security concerns are pushing countries towards a strategic autonomy in production of critical goods rather than keeping to the old value chains. What is emerging is not particularly a new order but a patchwork of ad-hoc blocs, bilateral deals, and regulatory barriers that replace tariffs with non-tariff measures.

For firms, operating in this environment this will require more flexible supply chains, larger inventories, supplier diversification, route diversification, corridor redundancy and stronger geopolitical risk management. Efficiency will no longer be the only organising principle of production; resilience will carry a higher premium. Fragmentation does not mean deglobalisation; it means trade is becoming more

political, risk-based, and sector-specific. For governments, the priority should not simply be to conclude more trade agreements, but to build a targeted industrial-trade strategy. This means identifying critical sectors, mapping external dependencies, securing access to key inputs, and developing trade arrangements with trusted partners that are relevant to core industries and critical supply chains.

Factor markets are being re-politicised.

The assumption that capital, labour, energy, and materials flow to their most productive use is being replaced by a logic of geopolitical power control and strategic autonomy. Energy markets have been permanently reshaped by the severance of Russian pipeline gas from European supply. Critical minerals are increasingly subject to export controls and strategic stockpiling rather than market pricing. Labour mobility is constrained by migration politics, even as demographic decline across Europe makes it more necessary. Capital flows are screened for political alignment. Across all production factors, the direction is the same: security logic is overriding price signals.

Fiscal orthodoxy is colliding with security needs.

The European fiscal consensus was built around the Stability and Growth Pact, deficit ceilings, and austerity as the default response to debt. Now, it is being overridden by defence spending. NATO allies committed at The Hague summit in June 2025 to 3.5% of GDP on core defence by 2035, with an additional 1.5% on security-related expenditures. EU member states defence investment reached €381 billion in 2025, exceeding the 2% guideline for the first time. Sixteen EU member states have already invoked the national escape clause of the Pact to make fiscal room. This is not a temporary deviation: it is a structural adjustment, resilient infrastructure, larger stocks and safety nets demand a lot of extra resources from private as well as from public players. The macroeconomic implication is that European governments will carry larger deficits, face a difficult trade-off for fiscal space between defence and social spending, and encounter tighter borrowing constraints. Ukraine, which has been running wartime deficits of 15-25% of GDP with massive external support since the beginning of full scale war, is the extreme case of a pattern now spreading across the continent.

New reality and challenges dictate the need for the central banks and monetary regulators to navigate between inflation control and the need to accommodate expanded public spending.

International financial institutions face the need of redefinition (again)

The IMF [has declared](#) uncertainty "the new normal." The World Bank's Evolution Roadmap is ongoing but incremental. Both institutions face a legitimacy problem: structures that still reflect the post-WWII distribution of power, lending conditionality built for peacetime adjustment, and project timelines too slow for countries under

systemic shock. The USAID freeze of early 2025 signalled a broader withdrawal of the US bilateral development finance, and rising defence budgets across donor countries are squeezing ODA further. IFIs are expected to do more with fewer resources, without a shared view of what the priorities should be. For Ukraine, the implication is concrete: reconstruction on a Marshall Plan scale has to be financed through institutions that were designed for gradual development lending.

Trade access, fiscal space, inclusive institutions, access to factor availability - all that is much more complicated. Ukraine is the country where all of these pressures converged first and hardest. The practical questions it faces now are maintaining macro stability under prolonged military shock, financing reconstruction outside standard IFI channels, building export capacity in a fragmenting trade system. And these are also questions that other countries will increasingly face too. The sections that follow look at what political arrangements hold up under these conditions, how IFIs need to adapt, and where the strong foundations of a Ukrainian economy lie.

Conflict as a Stress-Test for Governance: Ukraine's example

Institute for Economic Research and Policy Consulting

The new reality of permanent shocks and high uncertainty requires governance to be adaptive, flexible and credible. Ukraine's experience since the full-scale invasion in 2022 shows that these features are no longer optional additions to institutional strength. They are the practical conditions that allow the state to continue functioning despite the shock and disruption when standard assumptions no longer hold.

Governance as a resilience factor

Ukraine's wartime experience suggests that the traditional emphasis on strong and efficient institutions is no longer sufficient if they cannot adapt under pressure, act flexibly in crisis, and retain credibility under attack, both physical and informational. Most importantly, they are all necessary as weakness in any one of them can undermine the system as a whole, as Ukraine's stress-test shows. So, capacity allows the state to continue executing core functions. Adaptability allows institutions to change procedures quickly when normal rules no longer fit reality. Trust and credibility allow citizens, businesses and international partners to believe that the state remains functional and accountable. If one of these elements is weak, the whole system becomes more fragile.

It should be noted that Ukraine's governance model was not perfect or fully efficient under wartime conditions. However, it shows important governance features that allowed the state to continue functioning under extreme pressure. Ukraine is therefore a case of governance stress-tested by war.

Several examples can illustrate this point.

- The NBU had an emergency plan in advance and, as a result, capital and FX controls were introduced immediately on the first day of the full-scale war. For people and businesses, this meant that the banking system did not collapse. As a result, accounts remained accessible, payments continued, and cards were accepted in shops. This helped preserve trust at the moment of panic, which could have destroyed confidence in the national currency and financial system;
- The Government ensured the advance payment of some social transfers and pensions, which was made possible by the continued operation of the State Treasury. For citizens, it was important to know that money arrived on their accounts and the state did not disappear. This was critical for preserving the credibility of the state and avoiding a failed-state dynamic;
- Local governments, with the help of volunteers and civil society, organised shelters and basic support for internally displaced persons. This showed the adaptability of local institutions and communities, where central instructions could not cover each and every urgent need, local actors adjusted quickly and filled gaps. Ukraine's vibrant civil society was not an external add-on, but part of the country's resilience architecture as it was involved in emergency humanitarian aid, advocating for international support, helping the government to prepare the EU questionnaire for the opening of negotiations on EU candidate country, reconstruction and recovery at local level.
- The banking sector reform in 2015-2016 was one of the most challenging, but full-scale invasion and resulting economic crisis showed that it created an institutional buffer for banks to operate smoothly during full-scale war. The digitalization helped the government to expand support to the vulnerable during the full-scale war, provide public services, and somewhat reduce administrative barriers for businesses.

The country's experience also shows that reforms matter even when they are difficult and politically costly and translate into more capable, transparent, efficient institutions. Reforms implemented before the full-scale invasion created institutional buffers, which helped during the full-scale war. Banking sector reform strengthened supervision and confidence in banks, which later supported monetary and financial credibility during the war. Decentralisation and digitalisation improved the state's capacity to provide services, communicate with citizens and adjust support mechanisms under pressure. In this sense, reforms are not only a long-term institution building agenda, but also a form of preparedness for future shocks.

A cross-cutting lesson is that crisis governance requires discretion (rather temporal than permanent), simplification and de-regulations, while reprioritisation is beneficial. These tools were necessary for survival. Yet they also create risks of centralisation, weak accountability, corruption and institutional backsliding. The governance challenge is therefore to allow temporary flexibility while preserving safeguards, oversight and a

path back to normal rules. There is a need to avoid a permanent democratic backsliding after such centralization.

This lesson is relevant to other countries besides Ukraine. The EU is also debating how to adapt governance, regulation and policy coordination to a more hostile and volatile environment. Despite a deregulation drive in the name of faster decision making or competitiveness, the EU proved on a number of occasions from COVID crisis to the response to the war in Ukraine that it can act fast and with decisiveness during major crises, without undermining democratic or participatory principles. The main challenge the EU is facing is how to balance the need for good regulation and overhauling deregulation push (with the latter that coincides with far right political parties). Extensive deregulation might undermine democratic, environmental and participatory principles. The Draghi report on European competitiveness argues that Europe needs faster decision-making, simpler rules, stronger policy coordination, and a more strategic use of industrial, competition and trade policies to close the innovation gap, lower energy-related competitiveness costs, and reduce external dependencies. The point is about the ability to simplify and adapt rules without weakening accountability, competition or the rule of law. The latter is also important for Ukraine to bear in mind.

This sub-section looks at three dimensions of the stress test, - fiscal governance, monetary and financial governance, - and proposes lessons from Ukraine's recent history that might be learned and implied in other possible fragile and conflict contexts.

Fiscal policy: defence and state credibility quickly become a priority, shattering peace-time fiscal rules

Budgetary crisis became a visible stress test for fiscal governance. Traditionally fiscal policy aims to balance growth, redistribution, debt sustainability, and investment. The full-scale war changed this hierarchy immediately. Defence became the first-order public good, while the state also had to preserve social payments, basic public services and macro-financial credibility.

This required flexibility in raising and allocating financing. In 2022, the NBU directly purchased war bonds from the Government, allowing the monetisation of UAH 400 bn (7.6% of GDP) of the fiscal deficit. Monetary deficit financing of this scale would never be considered appropriate policy in peacetime, but it helped bridge the time gap before predictable donor financing arrived. The point is not that this was a desirable fiscal model, but that emergency financing helped the state remain functional when the alternative could have been non-payment of pensions, salaries and essential services and, thus, cause additional emigration of Ukrainians to the EU countries.

At the same time, fiscal institutions carried much of the credibility burden. The State Treasury remained operational, expenditure control continued, and the Government mobilised additional revenues, including through advance transfers from some state-

owned enterprises and other emergency steps. Citizens did not necessarily see these institutional mechanisms, but they saw the result as salaries paid in the public sector, pensions and social payments continued, state-owned companies were up and running, and the state remained present in everyday life.

Transparency also mattered for credibility under stress. Although sensitive defence and security information had to be restricted, the government also closed access to some other data. But core fiscal transparency was not fully abandoned. So, [Spending.gov.ua](#), Budget for Citizens (Open Budget) and Prozorro continued to provide important public information, with security-related exceptions. This contributed to keeping the trust among citizens, civil society and international partners.

The key governance lesson is that fiscal flexibility under existential threat must be matched with systems that preserve control, prioritisation and credibility. For future crises, the question is not simply whether fiscal rules should be suspended, but how emergency fiscal space can be opened without damaging the institutional foundations needed for recovery and long-term financing.

Meanwhile, medium-term planning became weaker and makes predictable external financing especially important. The broader challenge is therefore not only to mobilise more money, but also to keep financing linked to transparent priorities, credible project pipelines, appraisal, monitoring and accountability. To build such a chain the Ukraine's Government started the public investment management reform under the support of the World Bank. However, this is a disputable topic at the moment, whether the country in full-scale invasion should have strict regulation on investments.

Monetary policy puts the system credibility as the primary goal

Monetary policy is another area where the governance stress test is visible. For people, credibility is not an abstract central-bank concept. It means that the hryvnia is not in free fall, bank accounts remain accessible, payment cards work, shops accept non-cash payments, and savings do not disappear overnight. Therefore, monetary resilience in a shock depends on preserving functional capacity of the economy: payments, savings, banking continuity, and public confidence worked without a break.

Standard models of monetary policy assume functioning transmission mechanisms, relatively predictable expectations, and a manageable relationship between inflation, interest rates, and growth. War weakened all these assumptions. Markets became shallower, expectations became more fragile, supply shocks intensified, and the boundary between monetary stabilisation and state survival became blurred.

The credibility of monetary policy is defined through the capacity of the central bank to act decisively, communicate clearly, and preserve confidence in the national currency and financial system. The NBU's role was therefore to preserve public confidence first, and only then to manage a gradual return toward more normal policy settings. From the

first day of the full-scale war, the NBU introduced capital and FX controls to prevent capital runs and a sharper depreciation of the hryvnia. Later, as conditions allowed, it gradually eased some restrictions and moved toward greater exchange-rate flexibility.

Therefore, credibility under shock is not the same as strict adherence to peacetime rules. It is the ability to prevent panic, maintain the payments system, preserve confidence in the currency and signal a path back to more normal policy once conditions allow.

Regional governance: the first line of defence literally and figuratively

Local governance capacity is a core part of national resilience. The full-scale war does not affect all regions equally and, thus, different policies and approaches are called for. Some regions faced destruction and depopulation, others absorbed displaced people, got infrastructure overloaded, and economic functions changed.

To recognise this, in 2025 the Government defined four functional types of territories (the allocation of regions to these groups occurs in 2026):

1. Recovery territories - war-affected areas needing reconstruction and restoration;
2. Regional growth poles - territories with stronger economic and demographic potential;
3. Territories with special development conditions - areas facing acute security, demographic or structural constraints;
4. Sustainable development territories - relatively stable territories with continuity of development.

This distribution takes into account security, demographic, economic and financial aspects of all hromadas.

The logic is that civil preparedness in Ukraine is not produced only at the centre. It is a whole-of-society endeavour from hromadas, regional administrations and community-level institutions are often the first responders to crisis and, thus, are a part of Ukraine's civil preparedness. Where local institutions are capable, trusted and connected to national systems, they can adapt faster to local needs and reduce pressure on the central level.

At the same time, many hromadas are still not sufficiently prepared to become an efficient and resilient part of the recovery architecture. They lack administrative capacity, project preparation skills, co-financing instruments, implementation capacity, audit readiness and access to national digital systems.

Corruption risks, democracy threats and anti-backsliding mechanisms

War required extraordinary discretion in the form of faster decisions, simplified procedures, security-related restrictions on information, emergency procurement and constant reprioritisation. But these measures create a risk that emergency governance becomes a permanent style of governance. This risk includes both excessive centralisation and fragmented discretion without accountability. This is why anti-backsliding mechanisms are necessary.

First and foremost, democratic fundamentals should be preserved. Elections are not possible during full-scale war, but democracy is not reduced to elections alone. However democratic fundamentals depend on freedom of speech, media freedom, civic participation, oversight on public authorities, parliamentary oversight, independent anti-corruption institutions and the ability of society to demand accountability. The “cardboard protest” in July 2025 against attempts to weaken anti-corruption institutions showed that even under martial law, civic reaction and public pressure remain important safeguards. This distinguishes Ukraine’s wartime governance from authoritarian wartime mobilisation, where freedom and accountability are suppressed.

Second, rule of law, judicial reform, transparent procurement, state-owned enterprises governance, anti-corruption institutions and audit systems directly affect the credibility of the state as such. They also define the willingness of partners and investors to take long-term risks in Ukraine. The current bridge between resilience and reconstruction indicates that institutions that preserve trust during the war are the same institutions that will determine whether reconstruction finance can be mobilised, absorbed and protected from misuse. While transparency remains relatively high, especially in the fiscal sector, rule of law protection remains limited and SOE governance is still uneven. At the same time, the continued functioning of anti-corruption institutions matters because public trust can survive scandals only if society believes that wrongdoing can be investigated and accountability established for further [prevention](#). Simultaneously, such corruption scandals do not increase trust among investors and donors. There is much work to be done at the state institutional level to ensure institutional culture alternation to clean the system from similar incidents.

Anti-backsliding safeguards are partly embedded into the support and recovery architecture. These include EU accession conditionality, IMF and Ukraine Facility benchmarks, transparent public investment pipelines, open procurement data with narrowly defined security exceptions, independent audit, civil-society monitoring, corporate governance standards for SOEs, and continued judicial and anti-corruption reforms. While these are good and necessary measures, the Ukrainian state institutions will need to internalise democratic practice without constant need for external pressure and conditionality.

Recommendations

Based on Ukraine's experience, several recommendations can be provided.

For governments:

- prepare contingency plans for public finance, banking, payments, social transfers, public procurement and local service delivery, so that rapid decisions during shocks remain coordinated and legally grounded, people's trust and wider state credibility is retained.
- preserve core public finance management functions even under crisis conditions, including treasury operations, expenditure control, basic fiscal transparency, audit trails and reporting to parliament, citizens and external partners;
- protect democratic fundamentals under emergency conditions, including freedom of speech, civic participation, parliamentary scrutiny, independent media, civil-society monitoring and the independence of anti-corruption institutions;
- ensure temporary and transparent use of crisis instruments, including emergency spending, capital controls, simplified procurement or fiscal support measures, It should be also linked where possible to clear exit conditions. However, Ukraine is not always a good example of the implementation of this principle.
- treat public investment management, open procurement, audit, SOE governance, rule of law reforms and civil-society oversight as an important instrument for preserving trust and attracting long-term financing.
- strengthen regional and local governance capacity, including project preparation, co-financing, implementation, audit readiness and access to digital systems, so that hromadas can act as part of national resilience and future reconstruction architecture.

For international partners

- distinguish between temporary flexibility and requirements for reforms that protect against backsliding, including transparency, audit, procurement, SOE governance, judicial reform and anti-corruption safeguards;
- provide predictable multi-year financing, because uncertainty over external support weakens budget planning, increases the need for repeated budget amendments and reduces the credibility of medium-term fiscal policy to finance priority spending (defence under Ukrainian case);
- support governance capacity at national and local levels by investing in public investment management, project preparation facilities, local implementation capacity, audit systems, digital tools and data interoperability;

- recognise democracy, civic space, open data and independent oversight as part of the financing architecture, especially in countries where trust, corruption risks and implementation capacity directly affect the cost and availability of capital;
- use blended finance, guarantees and risk-sharing instruments together with governance safeguards, so that private capital can enter high-risk environments without weakening accountability standards.

Infrastructure global revolution

DiXi Group

Infrastructure investment has become a strategic necessity because economic resilience, competitiveness, and security increasingly depend on the operation of energy, transport, and logistics systems. In a world shaped by geopolitical fragmentation, supply-chain disruptions, climate risks, and fiscal uncertainty, infrastructure became a macroeconomic stabilization tool defining the ability of economies to absorb external shocks and remain functional during crises. Besides, for low- and middle-income countries (LMICs), weak infrastructure directly constrains industrial productivity, private investment, trade integration, and job creation. .

The scale of global infrastructure needs is enormous, but achievable with the right policy and investment mix. [According to](#) the World Bank, LMICs require infrastructure investments equivalent to 2-8% of GDP annually through 2030. The Bank [emphasizes](#) that decarbonized infrastructure pathways do not necessarily cost more than carbon-intensive alternatives. According to [Bruegel](#), further deployment of renewables coupled with electrification of power, heating, transport and other sectors would reduce demand for fossil fuels and drive prices down, making energy costs shift from volatile fuel expenses to fixed capital investments. Moreover, investments in clean energy and resilient infrastructure can enhance energy security by reducing dependence on imported fossil fuels and exposure to geopolitical shocks, such as disruptions linked to Russia's aggression against Ukraine, instability in the Middle East, and other global oil market crises.

Infrastructure becomes even more critical in fragile and conflict-affected economies. Since 2020, fragile economies have [experienced](#) annual per capita GDP declines of 1.8%, while other developing economies grew by 2.9% annually. By 2025, around 421 million people in fragile and conflict-affected states lived in extreme poverty, more than the rest of the world combined. In these contexts, infrastructure supports not only growth, but also territorial cohesion, government capacity, market functioning, and resilience to shocks. High-intensity conflicts can reduce GDP by approximately 20% over five years, making infrastructure quality a macro-financial issue rather than a purely sectoral one.

Energy and logistics infrastructure are central to global economic security and industrial competitiveness. Reliable electricity systems are essential for industrial production, digitalization, and public services, they reduce costs and strengthen food and energy security.

This explains why infrastructure financing has moved to the center of global geoeconomic competition. China's Belt and Road Initiative (BRI) remains the largest example. Since 2013, cumulative Chinese engagement under BRI has [reached](#) approximately USD 1.4 trillion, including USD 837 billion in construction contracts and USD 561 billion in investments. In 2025 alone, engagement reached a record USD 213.5 billion. Through transport, energy, and logistics corridors, China expanded its influence by offering infrastructure financing at a scale and speed that often exceeded those available through traditional donor and multilateral financing channels.

However, infrastructure investments alone do not automatically translate into economic growth. Evidence shows that infrastructural projects can fail to deliver expected development benefits when they are not accompanied by reforms in transparency, debt sustainability, governance, and environmental safeguards. Sri Lanka [provides](#) a notable example of this risk. Large-scale projects such as Hambantota Port expanded physical infrastructure but generated limited economic returns while contributing to growing debt vulnerabilities. This illustrates how infrastructure investments disconnected from broader economic fundamentals may create long-term fiscal and financial risks rather than sustainable growth.

Global infrastructure initiatives reflect broader geopolitical and economic security objectives. The G7's Partnership for Global Infrastructure and Investment (PGII) aims to [mobilize](#) USD 600 billion from 2022 to 2027, while the EU's Global Gateway increased its [target](#) from EUR 300 billion to EUR 400 billion by 2027. Similarly, the India-Middle East-Europe Economic Corridor (IMEC) [reflects](#) a corridor-based model focused on transport, energy, and digital connectivity linking Asia, the Gulf, and Europe. Infrastructure financing is becoming an instrument of economic security, standards-setting, and geopolitical influence.

For LMICs, the challenge is not only access to financing, but also structuring it in a way that supports long-term development and fiscal sustainability. Instability requires flexible financing architectures – combinations of concessional capital, guarantees, blended finance, and private participation. At the same time, financing flexibility should not come at the expense of standards. Poor-quality infrastructure creates long-term fiscal, environmental, and social liabilities that can undermine development outcomes for decades.

The global ‘infrastructure revolution’ is [not only about building more assets](#). It is about building the right assets, with the right standards, under financing structures that match the risks of a more fragmented world.

Ukraine's wartime experience offers perhaps the starkest contemporary illustration of this conclusion. According to [RDNA5](#), by December 2025 total war-related damage had reached \$195 billion, with energy among the three worst-affected sectors alongside housing and transport. In 2025 alone, the number of damaged energy facilities increased by 70% demonstrating with brutal clarity how a centralized infrastructure architecture becomes a strategic vulnerability. The response also revealed the countervailing power of adaptive design, with both fast repairs and slow yet systematic decentralization of legacy infrastructure, paired with seizing the European Network of Transmission System Operators (ENTSO-E) synchronization benefits.

Infrastructural interconnectivity is a two-way street: while it currently helps sustain the resilience of war-torn Ukraine, Europe as a whole could benefit even more in the future from the full deployment and integration of Ukraine's renewable energy potential. Ukraine thus embodies both the warning and the blueprint the global infrastructure revolution requires: quality, redundancy, and risk-proof design are not engineering refinements but existential choices, with consequences measured in the ability of economies and societies to survive.

Recommendations

For governments:

- prioritize spending on infrastructure that delivers both growth and resilience benefits, especially in energy systems, transport corridors, ports, and trade logistics;
- ensure that infrastructure investments are accompanied by governance reforms, debt sustainability safeguards, and broader economic development measures. Infrastructure projects should be assessed not only for their technical feasibility but also for their long-term economic contribution and fiscal sustainability;
- treat climate resilience and decarbonization as core design criteria, especially for assets with long life cycle;
- strengthen institutions responsible for procurement, maintenance, transparency, and project preparation, since weak implementation capacity often matters as much as lack of finance.

For IFIs/DFIs:

- expand the use of guarantees, blended finance, concessional windows, and local-currency tools as a leverage to crowd in private investment in LMICs with higher risk environment;
- increase support to project preparation facilities so that governments can yield more investable, standards-compliant projects to market;
- align infrastructure financing with internationally recognized quality and sustainability standards, including the G20 QII principles and Blue Dot-type approaches;
- prioritize no-regret investments: grid resilience, maintenance, interconnection, multimodal logistics, and climate-proofed infrastructure upgrades;
- in fragile and conflict-affected settings, integrate infrastructure finance with broader objectives of economic stabilization, service continuity, and recovery of private sector activity.

Energy resilience

Energy is the foundation of economic development that enables effects in other sectors. Investment in this sector offers systemic multiplier effects that no other infrastructure category can match. Every dollar invested in energy infrastructure enables downstream returns across transport, manufacturing, agri-processing, and services. For some of the emerging and developing economies, the energy deficit is a single greatest constraint on development.

At the same time, the global energy system must not just provide more energy but [decarbonize rapidly to stay within 1.5°C warming trajectories](#). This dual imperative makes energy investment both urgent, sometimes expensive and structurally complex. For IFIs, energy represents a rare category where concessional finance can simultaneously address poverty reduction, climate mitigation, and long-term economic resilience.

Recent geopolitical developments have propelled energy security to a matter of national resilience and strategic autonomy. Russia's weaponization of energy exports, repeated attacks on Ukraine's energy infrastructure, and growing instability in the Middle East with blockade of key maritime routes have exposed the vulnerabilities associated with concentrated supply chains and import dependence.

Ukraine's experience since 2022 demonstrates that resilient energy systems require not only generation capacity, but also diversification of supply, decentralized energy solutions, interconnection with regional markets, and the ability to rapidly restore critical infrastructure after disruption. These lessons are shaping global approaches to

energy investment, where resilience, self-sufficiency, and security are becoming as important as affordability and decarbonization.

Systematic approach is the key when investing in energy. Investment decisions should account for every node in the value chains – from generation to end-user affordability. When IFIs fund generation without grids, or grids without viable tariff structures, or demand stimulation without supply, the result is stranded assets and wasted capital. Energy also intersects with climate risk, land tenure, water availability, and rapidly shifting consumer behavior, for example the rise of distributed generation and electric mobility, all of which must be modelled into investment design. The importance of energy infrastructure extends beyond just generation to reliable, affordable, and resilient energy systems.

Growing geopolitical tensions, climate risks, and infrastructure vulnerabilities have highlighted that energy resilience is as important as energy capacity. Investments that fail to account for transmission constraints, climate impacts, supply chain disruptions, or changing demand patterns may undermine both economic performance and energy security. In this context, IFIs play a critical role in supporting energy transitions and reducing investment risks. The effectiveness of these investments depends on whether they address energy systems as a whole rather than isolated infrastructure assets.

IFIs energy portfolios carry a documented record of high-profile failures rooted in systems-level blind spots. Three recent cases illustrate the pattern. In Pakistan, [the World Bank](#) and bilateral donors invested heavily in utility-scale solar generation, but the national transmission grid cannot absorb the power produced due to underfoundation and technical constraints. Between 2014 and 2023, [surplus generation capacity ranged from 36 to 70 percent](#) even as blackouts persisted. In Uzbekistan, the [EBRD and IFC](#) have backed EV charging infrastructure rollout alongside renewable energy targets, yet as [industry analysis](#) warns, the strain of additional EV load on an already struggling grid risks turning charging infrastructure into a stranded asset. In Kyrgyzstan, the [World Bank](#) has provided technical and financial support for hydroelectric expansion on the Naryn cascade, including the Kambarata-1 HPP. However, [documented evidence](#) shows glacial retreat is reducing river flow, threatening long-term reservoir yields and the debt-service logic underpinning the investment. These examples show that a single-asset solution is imposed on a multi-variable problem.

Centralized power generation remains essential, but must be climate-aligned and system-integrated from inception. Large-scale renewables such as utility solar, onshore and offshore wind, geothermal, and hydropower represent the backbone of any credible decarbonization trajectory. Repowering and rehabilitating existing fossil-fired assets with carbon capture or retirement packages is critical in middle-income economies still dependent on coal and gas. The [IEA Net Zero scenario](#) makes clear that achieving

climate targets requires a rapid phase-out of unabated fossil fuel generation and accelerated deployment of clean energy alternatives.

Grid investment is the most underfunded and most consequential gap in the global energy transition. Transmission and distribution infrastructure is the physical backbone of any energy system that [requires an estimated USD 21 trillion in investment by 2050](#), yet it attracts the least private finance and the least concessional attention. The IEA confirms that global grid investment has remained static at around USD 300-400 billion per year even as renewable capacity has nearly doubled.

The transition to low-carbon energy systems is therefore constrained by financing barriers, particularly in emerging and high-risk markets where private capital remains reluctant to invest. In such contexts, IFIs can play a critical role by directly financing generation assets, providing concessional capital, and reducing investment risks. To maximize development outcomes, these investments should be accompanied by investments in grid infrastructure, storage, and reliable offtake arrangements.

Net-zero commitments assume investment not only in supply but in the structural transformation of demand. The future economy is defined by electrification of end-uses alongside radical improvements in energy efficiency. [The IEA analysis](#) shows that energy efficiency measures cost less than half as much per unit of energy saved as new generation and grid infrastructure, yet are consistently underfunded relative to supply-side investments. In many cases, state intervention ruins the market signals necessary for change in consumer behaviour.

This reveals a critical gap: while investment strategies and financing mechanisms often focus on expanding energy supply, achieving net-zero goals depends equally on investments that reduce, reshape, or decarbonize demand. IFIs are uniquely positioned to finance the enabling conditions: building retrofit programs, industrial decarbonization pilots, and the regulatory and financial architecture for carbon pricing. They can also support green hydrogen and other technological solutions, which play a complementary role in decarbonizing hard-to-abate sectors where direct electrification is not technically or economically viable. These investments are diffuse, long-horizon, and often pre-commercial, struggling to attract sufficient private capital despite their importance for meeting climate targets. The IFIs role in the net-zero transition is not to follow private capital but to create the conditions under which private capital eventually follows.

Ukraine's [experience](#) demonstrates that energy resilience has become a core component of national security and economic competitiveness. The repeated attacks on generation facilities, substations, transmission corridors, and fuel infrastructure since 2022 have shown that energy systems must be designed not only for efficiency, affordability and decarbonization, but also for survivability under conditions of

disruption. As geopolitical tensions increase and critical infrastructure becomes even more vulnerable to both physical and cyber threats, resilience is emerging as a strategic criterion.

Excessive dependence on centralized generation and long transmission corridors, which were Ukraine's vulnerability, needs to be reduced. Large power plants remain essential, but the systems built around a limited number of critical nodes are fragile. As a result, distributed generation, modular solutions, flexible generation assets, demand response, and regional energy self-sufficiency are increasingly viewed as key components of resilient energy systems. Ukraine's rapid deployment of gas engines, cogeneration units, and other distributed energy resources provides a practical example of how countries can strengthen energy security while maintaining system flexibility. For advanced or developing economies this would also translate into higher costs as such flexibility requires maintaining reserves and higher redundancy.

Russia's brutal attacks on Ukraine have also highlighted the critical importance of grid resilience. In many cases, the main constraint was not the availability of generation capacity, but the ability to deliver electricity through damaged transmission and distribution networks. Investments in substations, transmission corridors, redundancy, interconnectors, mobile substations, and standardized repair equipment can be as strategically important as investments in new generation capacity. The ability to rapidly restore damaged infrastructure has often depended on standardization, interoperability, and preparedness rather than on the funding available.

Finally, Ukraine's experience demonstrates that future energy systems must be planned as interconnected resilience ecosystems rather than isolated infrastructure assets. Energy disruptions rapidly cascade into heating, water supply, transportation, communications, healthcare, and industrial production. The ability to maintain critical services therefore depends on cross-sector planning, emergency preparedness, distributed backup solutions, and strong institutional coordination. These lessons extend far beyond wartime conditions and are increasingly relevant for countries facing climate-related disruptions, cyber threats, supply chain vulnerabilities, and growing geopolitical uncertainty.

Recommendations

For governments:

- consider 11 operational [lessons learned from Ukraine's experience](#):
 - reduce strategic dependence on centralized generation;
 - protect and expand flexible generation;
 - prioritize grid resilience to ensure generation capacity use;

- consider cascading dependencies in urban energy systems as a distinct risk;
- ensure interconnectivity as a strategic resilience factor, but account for constraints;
- standardize equipment and repair approaches to accelerate recovery;
- integrate air defense, physical (engineering) and cyber protection into energy security planning;
- build logistics resilience, reserves, and clear prioritization for supplying primary energy sources;
- strengthen crisis communications and grassroots preparedness;
- enable industrial adaptation through backup supply and energy management;
- use regulatory policy to accelerate reconstruction and restore market stability.

For IFIs/DFIs:

- scale up support for flexible and decentralized systems, including storage, demand response, and distributed generation to reduce reliance on vulnerable centralized infrastructure;
- invest in interconnectivity with safeguards, combining cross-border integration with transmission upgrades, coordinated standards, and risk management mechanisms;
- factor in physical and cyber security of infrastructure by financing hardened assets, redundancy solutions (as a way of improving system adequacy), and institutional capacity for continuous adaptation to evolving threats;
- prioritize grid modernization such as high-voltage direct current (HVDC) corridors for cross-border trade, smart distribution networks capable of integrating distributed resources and last-mile electrification in rural and peri-urban areas;
- support enabling policy and market frameworks, such as streamlined permitting, adaptive regulation, support schemes (capacity markets, special tenders etc.) and emergency pricing mechanisms to allow addressing crises;
- introduce resilience as an investment criterion, by embedding engineering protection, redundancy, and rapid recovery metrics into project appraisal frameworks.

Logistics as strategic infrastructure

Trade routes are now contested infrastructure. The architecture that organised Eurasian transit for thirty years was built on optimisation (lowest unit cost, shortest distance, most efficient transit) and on the assumption that physical corridors would remain politically neutral. Russia's weaponisation of transit since 2022 has eliminated that assumption. Gas supplies to Europe were used as leverage, Black Sea shipping was blockaded, civilian vessels were attacked, and Ukrainian port infrastructure was struck repeatedly. Each step demonstrated that any single dominant route becomes a strategic instrument in the hands of whoever controls it.

The response has been a generational rebuild of the European transport architecture, centered on redundancy and security. The Middle Corridor across the Caspian (supported through Global Gateway and IFI co-financing), the EU Solidarity Lanes through Ukraine's western borders, and the Commission's 2024 Black Sea Strategic Approach are parts of a transit architecture for European trade that does not depend on Russia or Belarus. Higher unit costs are acceptable in exchange for political resilience. The investment scale is generational, and the design principle has shifted from optimisation toward systemic redundancy.

Ukraine is among the world's largest exporters of wheat, sunflower oil, maize, and other foodstuffs. The 2022 blockade of Ukrainian seaports was a global food security event. Grain prices spiked across global markets, food insecurity worsened sharply across the Middle East, North Africa, and parts of South Asia, and the Black Sea Grain Initiative became a multilateral emergency arrangement involving the UN, Turkey, Russia, and Ukraine. When Ukrainian export logistics failed, the consequences first appeared in the food import bills of the most exposed economies and ultimately in political instability across the regions that depend on Black Sea grain. The viability of Ukrainian export corridors is therefore a global food security question, and the investment case for Ukrainian port and corridor infrastructure has constituencies well beyond Kyiv and Brussels.

Ukraine is also a future EU member, and one with more Black Sea coastline than any current or candidate member state, including the Crimean Peninsula under temporary Russian occupation. After Ukraine's accession, the EU's external maritime boundary will extend from the western Black Sea to the Sea of Azov, and EU transport networks will have to extend through Ukrainian territory to reach those ports. The integration of Ukrainian rail, road, and port infrastructure with the TEN-T network is therefore foundational to the EU's own future logistics architecture. Investments made now in western corridors, port rehabilitation, gauge-change capacity, and customs interoperability shape the system the EU will operate post-accession.

For Ukraine, connectivity has become a security issue. Before 2022, 74% of Ukrainian exports were transported by sea; in agriculture, the share was 96–97%. The system was economically efficient but strategically exposed. When Russia blockaded the ports in early 2022, the share of agricultural exports going by sea collapsed from 97% in January to 27% in April. 20 million tonnes of grain were stuck in storage. Whether those export routes function is now part of what determines whether the Ukrainian state can finance its own defense. That reframes how logistics infrastructure must be planned, financed, and protected.

Ukraine's wartime experience has produced three operational lessons that apply directly to corridor planning across the regions where transit routes are politically exposed.

Redundancy kept exports alive. The Danube ports were economically marginal until 2022. They were small, slow, and far more expensive per tonne than the deep-sea ports of Greater Odesa. When the maritime routes closed, the Danube ports absorbed the flow. Transshipment through these ports peaked at 2.9 million tonnes in August 2023. Once the Ukrainian Sea Corridor opened and flows shifted back to the cheaper maritime route, Danube throughput fell roughly tenfold. The drop reflects the resumption of operations on the maritime route. The Danube served as a reserve channel, absorbing flow during the maritime closure and reducing throughput upon reopening. Economically marginal capacity, therefore, has strategic value as backup. And building such capacity after a disruption costs several times as much as maintaining it in advance.

Regulation can be as decisive as physical infrastructure. When maritime routes were cut, Ukraine's western land borders had to absorb the flow. The infrastructure was never designed for that; trucks waited 7 to 10 days at the crossings. A single regulatory instrument – the EU-Ukraine Road Transport Agreement, which suspended permit requirements – preserved [between USD 13 and 26 billion](#) in trade during 2022–2024. Without it, road-based trade with the EU would have been roughly 31% lower in 2023. The agreement required no change to physical infrastructure; only the regulatory framework shifted. Investment in physical capacity at western crossings must therefore be paired with harmonization of customs, transit procedures, and permits with EU standards. At many border crossings, the regulatory regime is the binding constraint.

Maritime corridors in wartime require public war-risk insurance to bring premiums down to commercial levels. In 2025, there were 184 missile and drone attacks on ports in the Odesa region – one every two days. The attacks struck civilian vessels and killed crew members. The Ukrainian Sea Corridor continued to operate because three elements were built around it: military protection, backup power for the ports, and war-risk insurance with public risk-sharing. War-risk premiums for Ukrainian cargo fell from over 3% of cargo value in 2022 to [about 0.75% by 2024](#). This decline was driven by the

UK-Ukraine Unity Facility and related public risk-sharing schemes, which made commercial shipping insurable again. Without these schemes, commercial shipping would not have returned to Ukrainian ports, even though the route was physically open. For reconstruction finance, the most replicable lesson is that standing public risk-sharing instruments can convert physically open routes into commercially viable ones.

Logistics determines whether the other growth pillars can scale. Critical minerals, miltech, agro-processing, and post-war manufacturing all depend on functioning corridors to EU markets. Single-route dependence, slow border procedures, and unrehabilitated infrastructure each impose a cost premium that erodes the investment case for these sectors. Ukraine's position on the eastern edge of the TEN-T network also makes it part of the EU's economic security architecture. EU investments in Ukrainian logistics, therefore, serve EU supply chain diversification as much as they support Ukrainian reconstruction.

Recommendations

For governments:

- treat logistics corridors as economic security infrastructure, with planning coordinated bilaterally with EU partners;
- build redundancy into critical corridors (rail, road, river, sea) so that a single-point disruption cannot collapse total capacity, accepting that some capacity will be economically marginal in peacetime;
- prioritize the soft-connectivity layer alongside physical investment (customs harmonization, permit regimes, digital documentation, and certification);
- push for a binding timeline to extend the TEN-T core network through Ukraine before accession, to signal to investors, neighbors, and Russia how Europe views its eastern flank.

For IFIs/DFIs:

- finance logistics as part of integrated value-chain packages alongside CRM, energy, and industrial projects;
- support public risk-sharing instruments that make corridors commercially viable, drawing on the demonstrated effectiveness of the Unity Facility model;
- finance investments at the cross-border interface (gauge-change capacity between Ukrainian and EU rail networks, joint customs and inspection facilities, harmonized border procedures);

- evaluate transport infrastructure projects against resilience criteria (route redundancy, hardened control systems, rapid-repair capacity) using the same operational principles already developed for Ukraine's energy sector.

Critical minerals for autonomy

DiXi Group

Critical minerals underpin nearly every strategic sector of the modern economy – from batteries, power grids, and renewable energy technologies to semiconductors, aerospace, and defense industries. Their global supply chains remain highly concentrated. [According to the IEA](#), the average market share of the top three refining countries for copper, lithium, nickel, cobalt, graphite, and rare earth elements increased from around 82% in 2020 to 86% in 2024. China alone is the leading refiner for 19 out of 20 strategic minerals, with an average refining market share of approximately 70%.

For economies seeking to secure critical mineral supply chains the key strategic vulnerability lies not only in extraction, but in processing, refining, and downstream manufacturing. Control over refining capacity, industrial know-how, logistics, and access to affordable energy increasingly determines geopolitical leverage. As a result, governments now treat critical minerals as a strategic asset class rather than a conventional commodity market. This shift is reflected in new industrial policies across major economies. Under the Critical Raw Materials Act, the [EU aims](#) by 2030 to domestically extract at least 10% of annual consumption, process 40%, recycle 25%, and ensure that no more than 65% of any strategic raw material comes from a single third country.

Diversifying supply chains requires active state support and new financing models. Mining and refining projects outside dominant supplier countries often face capital costs up to 50% higher, making diversification difficult without public intervention. As a result, Western economies increasingly rely on subsidies, concessional finance, guarantees, contract-for-difference mechanisms, price floors, volume guarantees, strategic stockpiles, and long-term offtake agreements. The United States alone [allocated](#) USD 7.5 billion for critical minerals through defense-related funding, including USD 2 billion for stockpiling and USD 5 billion for supply chain investments.

In strategic mineral projects, financing costs determine commercial viability. Concessional debt, guarantees, political risk insurance, minority equity participation, and state-backed offtake agreements can significantly lower the weighted average cost of capital (WACC) and improve access to long-term financing. One increasingly discussed model is a [“layered capital stack”](#) combining public first-loss or quasi-sovereign capital with concessional debt, guarantees, commercial financing, industrial

partnerships, and advance purchase agreements. Such mechanisms are critical for transforming geopolitical demand for diversification into bankable industrial projects.

Strategic reserves alone are insufficient to address growing supply chain risks. The emerging response has been a shift toward “friendshoring” – the development of integrated value chains among trusted geopolitical partners. Rather than focusing solely on resource extraction, these partnerships [seek to connect](#) extraction, refining, manufacturing, recycling, logistics, and end-use industries into a coordinated ecosystem. In practice, this means combining the resource base of mineral-rich countries with the capital, technology, and industrial demand of partner economies.

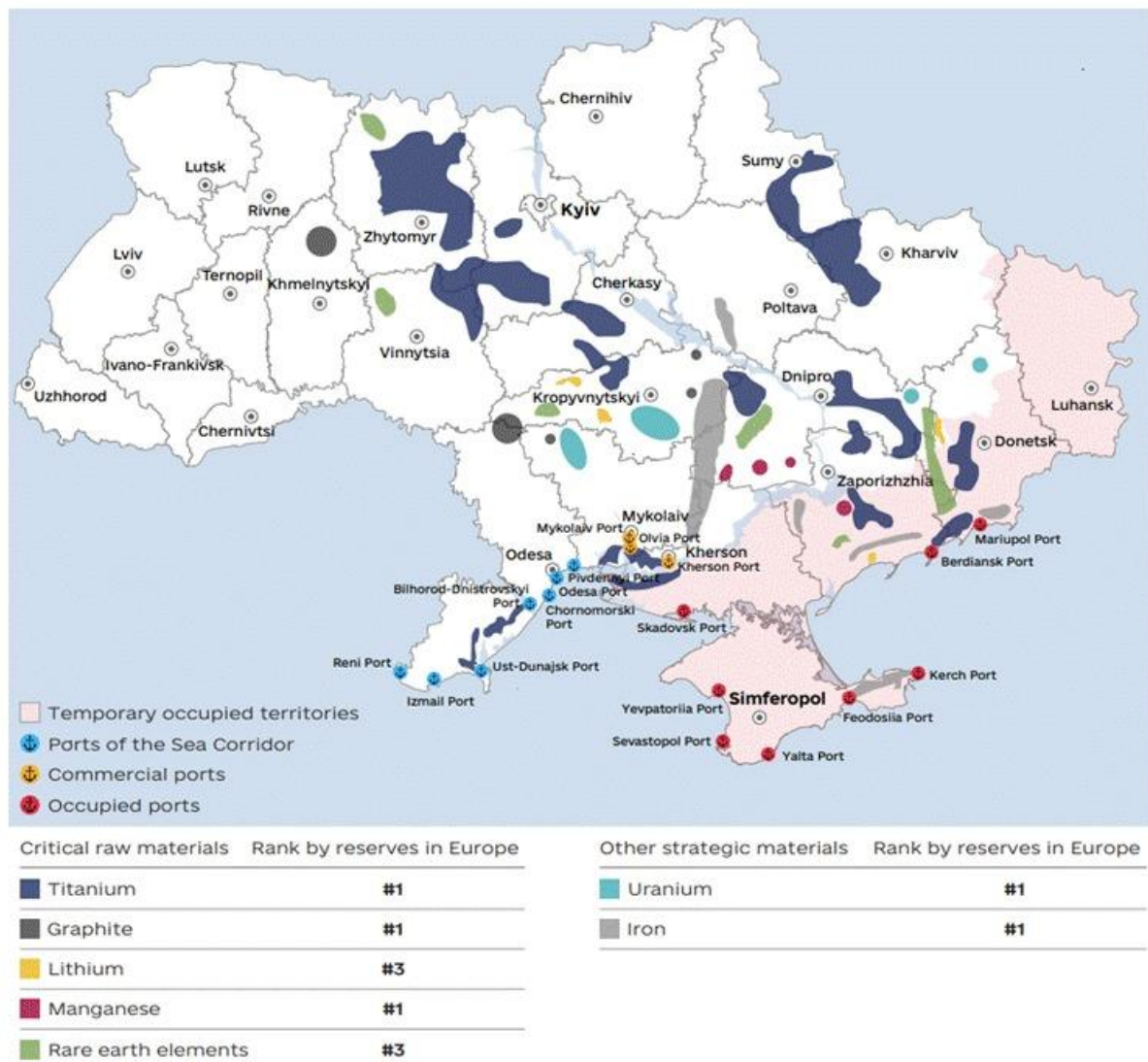
In this context, Ukraine is well positioned to become a strategic partner in emerging friendshoring initiatives aimed at diversifying critical mineral supply chains. Ukraine possesses reserves of 30 out of 60 minerals classified as critical by the United States and 26 out of 34 on the EU critical raw materials list. The strongest near-term opportunities include titanium, graphite, manganese, uranium, and zirconium value chains.

Unlike many emerging producers, Ukraine already has production capacity or advanced projects in several strategic mineral value chains, allowing faster scaling of industrial activity. Twelve of the most mature mining projects included in Ukraine’s 2025 investment [catalogue](#) represent a combined investment value of around USD 2.4 billion.

International partnerships are increasingly focused on integrating Ukraine into strategic industrial and supply-chain ecosystems. The EU-Ukraine Strategic Partnership on Raw Materials and Batteries, launched in 2021, [remains](#) the main framework for aligning Ukraine with European critical raw materials and battery value chains, including ESG standards, regulatory convergence, and joint industrial projects. Its relevance has only increased under the EU Critical Raw Materials Act – one of the graphite projects in Ukraine was recognized as a Strategic Project by the EU. At the same time, the 2025 US-Ukraine Reconstruction Investment Fund agreement reflects a more investment- and security-driven approach, linking Ukraine’s reconstruction with strategic resource development, energy, infrastructure, and emerging technologies.

Both tracks create opportunities for Ukraine to position itself as a trusted partner in Western critical minerals supply chains, but also raise challenges related to coordination, project bankability, and governance standards. For Ukraine, the key challenge will be to turn these partnerships from political frameworks into specific investment avenues that support value-added processing, industrial integration, and long-term alignment with best industry practices.

Map of strategic resources in Ukraine



Source: *Strategic Roadmap for Unlocking Ukraine's Critical Raw Materials Potential*

Recommendations

For governments:

- treat critical minerals as part of economic security strategy, not only sectoral policy (or a set of them), and design regulations enabling growth across the full value chain;
- reduce hostile dependencies and/or concentration by combining friendshoring, strategic partnerships, and domestic capability-building, rather than relying on spot-market diversification alone;
- use equity, offtake agreements, co-investment structures, guarantees and other innovative tools to make projects bankable;

- avoid a raw-material enclave model, require project pipelines to support local value addition, skills development, regulatory reform, and enforcement of best environmental and social standards;
- focus on related infrastructure (power supply, logistics) and inputs to create an ecosystem of products and services, and thus improve competitiveness along the value chain.

For IFIs/DFIs:

- move beyond project-by-project approach toward value-chain financing logic, including transport, energy supply, processing, recycling, and other elements of industrial infrastructure linked to mining projects;
- expand the use of blended finance, political risk insurance, first-loss capital, and concessional windows for projects in jurisdictions that are strategically important but with higher commercial risk profile;
- support preparation capacities and better data management, as well as implementation of high ESG and transparency standards as major non-financial factors of project maturity and market fit;
- prioritize projects that embed producer countries into higher-value segments of the chain, rather than locking them into low-value extraction roles.

Miltech/Dual-use as a new industry driver

Centre for Economic Strategy

In the new fragmented world with uneven transatlantic partnership developments, autonomous and/or friend-shored defence industry is one of the key resilience pillars. Russo-Ukrainian and Iranian wars uncovered dependencies in key military goods, ammunition, technologies, and put autonomy, available capacities and credible deterrence at the centre of western countries decision-making in the area of defence.

Europe is entering a historic defence investment cycle. EU-level instruments such as Readiness 2030, SAFE, EDIP and the proposed European Competitiveness Fund have opened unprecedented opportunities for Ukrainian participation. Yet formal eligibility does not automatically create market access. Defence procurement remains largely shaped by Member States, national industrial preferences, certification rules and political risk assessments.

Ukraine's wartime defence-industrial acceleration against this background has turned into one of a core European strategic strengths. This creates a narrow window. If Ukraine is not embedded early, European procurement cycles, supply chains and joint

programmes may solidify without Ukrainian firms. Once industrial partnerships are locked in, later entry will be more difficult, more expensive and less politically attractive.

For Ukraine, milltech is the most credible pillar of the country's future non-resource based economy and a potential contribution to Europe's interest in having Ukraine as an ally. Against the absence of restrictive regulations, with large fiscal space earmarked for defence procurement and with the war-time need driving producers' flexibility and quick reaction, the sector has emerged as a new powerful economic pillar within just three years. MilTech combines battlefield-tested innovation, fast production cycles, strong domestic (and likely external) demand, engineering talent and growing interest from European partners. The strategic risk is timing. Ukraine is unlikely to be formally excluded from Europe's emerging defence-industrial architecture, but it is important to make it work in practice soon.

The sector matters for Ukraine's future economy because of several reasons:

- It is a replacement growth engine for the old industrial model. Russia's invasion accelerated the collapse of Ukraine's post-Soviet, Russia-oriented machine-building base. Defence, miltech and dual-use production can become a new industrial growth pole: technology-intensive, export-oriented, and linked to European value chains.
- It has already demonstrated exceptional wartime adaptability. Ukraine has moved from a small number of traditional defence producers toward a high-velocity innovation ecosystem. Drones, electronic warfare, software-enabled systems, ammunition, long-range capabilities and battlefield data solutions have developed under extreme pressure and with rapid feedback from frontline users.
- It creates demand for advanced skills and productive capital. The sector can absorb engineers, software developers, precision manufacturers, electronics specialists, compliance professionals, production managers and investors. It is therefore not only a security sector, but a driver of human capital, manufacturing modernization and private investment.
- It gives Ukraine a distinctive European offer. Ukraine's comparative advantage is speed, cost-efficiency and battlefield validation. These attributes are highly relevant to Europe's own goals: stronger defence readiness, larger production capacity, better interoperability and lower costs through industrial competition.

According to the Ministry of Defense, production capacity increased [from around \\$1 billion in 2021 to 35 times that level by 2025](#). The sector now includes around 100 state-owned and 800 private firms, employing approximately 300,000 people — about 4% of Ukraine's employed population. Private firms with arms production as their main

activity have doubled, while SME numbers have grown fivefold. Annual registrations of defense-sector firms in 2022–2024 were roughly four times higher than the 1991–2021 average.

The fastest-growing areas are drones. Drone production has expanded especially rapidly: for example, by January 2026, Ukraine was producing around 1,000 interceptor drones per day, from virtually zero before the war. Drones now account for the largest share of newly registered defense-related firms, while electronic warfare is also expanding, though it remains constrained by dependence on imported components and the difficulty of moving from small-scale innovation to reliable mass production.

Traditional sectors such as military transport, explosives, engine components, and ammunition remain more concentrated around established producers, with higher barriers to entry and greater capital intensity. New entrants are therefore concentrated mostly in faster-moving miltech segments with a notable exemption of Fire Point, producer of a long-range missiles.

Wartime state procurement has been the key driver of this expansion. Military procurement has increased sixteenfold compared with pre-war levels, while capital investment in defense has risen eightfold. The state now spends over €20 billion annually on defense-related goods and services, compared with around €1.5 billion before the war. This sustained demand, combined with battlefield feedback through systems such as DOT-Chain, has created a powerful incentive for firms and investors to continue expanding Ukraine's defense and dual-use industrial base.

The dual-use segment is especially important because it connects defence needs with civilian economic modernization. Technologies such as robotics, AI-enabled analytics, communications systems, cyber tools, sensors, autonomous platforms, electronic components and advanced manufacturing can serve both military and civilian markets. Post-war demand for defence technologies is also expected to persist as global buyers would be replenishing/creating their stocks - a move that is logical for a shaken world, where autonomy and security become priorities.

Recommendations

For governments:

- *At EU level:* move from declaratory eligibility of Ukraine for its programs to practical integration. The EU–Ukraine Task Force should track actual procurement inclusion, investment projects, joint ventures and co-production initiatives involving Ukrainian firms. It should include senior Member State procurement representatives and translate procurement priorities into actionable opportunities for Ukrainian and European partners.

- *At Member State level:* make Ukraine part of procurement and industrial planning. Governments should identify capability areas where Ukrainian firms can participate through joint ventures, subcontracting, licensing, maintenance and repair, or co-production. They should communicate demand signals early and use national guarantee institutions to de-risk investment.
- *At Ukraine level:* make the sector investable and interoperable. Ukraine should liberalise defence export controls in a phased and predictable way, while preserving priority supply for its armed forces. It should strengthen IP protection, judicial predictability, certification systems, compliance standards, financial transparency and corporate governance in firms seeking European partners.

For IFIs:

- Start accepting dual use and defence as sectors, fully aligned with the ESG
- Make special earmarked funds allocations to development of the defence industrial base and autonomous European defence-related value chains.
- Tailor emerging defence tech industry programs to the special needs – relaxed requirements to the reporting, smaller tickets size for the emerging industry players, insurance accessibility at subsidized rates.

IFIs' role in financing the new economy

In a shaken world, private investment is unlikely to flow solely on the basis of market fundamentals. Enabling private investment is becoming a core IFI function. The experience of Ukraine illustrates this reality particularly clearly. FDI inflows to Ukraine collapsed to USD 350 million in 2022 before rebounding to average of USD 3,5 billion in 2023-2025 according to [the NBU data](#). The composition reveals a cautious investor base: the vast majority of these inflows are reinvested profits driven by strict capital controls, likely more than by investment interest.

Even where long-term economic opportunities are substantial, investment decisions remain constrained by security risks, insurance gaps, labour shortages, legal uncertainty, infrastructure bottlenecks, and high financing costs.

These constraints are not unique to Ukraine. They are increasingly relevant across a wider group of countries facing geopolitical tensions, energy-transition challenges, or large-scale economic transformation. As a result, the world risks a growing divergence between where investment is most needed and where private capital is willing to go.

This changing landscape requires a new role for international financial institutions. After the Second World War, institutions such as the World Bank were created to support reconstruction and restore productive capacity in economies emerging from crisis. Over the past decades, IFIs have shifted from directly financing large-scale infrastructure

projects toward supporting policy reforms, institutional development, and private capital mobilization. Initiatives such as the World Bank's [Maximizing Finance for Development](#) (MFD) approach prioritize improving the enabling environment and crowding in private investment rather than financing assets directly.

While this model has expanded the reach of development finance and reduced public balance-sheet exposure, it has often proven less effective in addressing infrastructure gaps in high-risk environments where private capital remains reluctant to invest.

The central challenge today is not only financing investments but enabling them. IFIs must become catalysts that reduce risk, expand access to insurance and guarantees, crowd in private capital, support integrated investment ecosystems, and create a more level global playing field. Their success should be measured not only by the volume of lending they provide, but by their ability to unlock productive investment, strengthen economic resilience, and promote greater cohesion in an increasingly fragmented world economy.

Example of Ukraine as a high-risk investment destination shows that the main constraints should be incorporated into the resilient system design and the IFI's logic of future interventions:

Security and insurance. The OECD country risk rating of 7 reflects active hostilities and limits the availability of standard commercial insurance for physical damage and business interruption. International guarantees and blended-finance instruments can reduce exposure, but coverage remains incomplete, especially for smaller projects. War-risk insurance and guarantee eligibility should therefore be assessed at the pre-feasibility stage, not after project design is complete. This is the single most important part that is needed from the outside as in times of distress the ratings of the governments of the distressed countries' are falling short to satisfy investors' confidence needs. The IFI's role here as de-risking actors is paramount. For IFIs risk taking should be speeded up - for example, for wartime situations the support should not be subject to a company's profitability, but the importance of the project for the development and resilience of the state.

Labour availability. Ukrainian businesses increasingly report shortages of workers, particularly in skilled technical occupations. The survey figures cited for this section indicate that 67% of firms identify workforce availability as their leading constraint, ahead of input prices (45%), safety concerns (42%) and energy disruptions (30%). Mobilisation, displacement and emigration have made labour planning a central investment issue. Manufacturing and R&D projects should include training costs, retention measures and contingency plans for tight labour supply. IFIs address this problem by supporting social infrastructure like schools, healthcare facilities and occasionally housing.

Legal predictability. Investor surveys continue to identify courts, law enforcement and administrative discretion as concerns. For Ukraine, EU accession conditionality is the main medium-term driver of institutional improvement, but it does not remove near-term project risk. Investors in minerals, infrastructure and other regulated sectors should rely on transaction-specific protections where available, including stabilisation clauses, clear permitting timetables and dispute-resolution mechanisms. IFI-driven rule of law reforms are therefore enablers for private capital to move to supported countries.

Domestic finance. Ukraine's credit market remains shallow for large investment projects, and domestic partners may be unable to provide significant equity or long-term debt. This makes some joint-venture structures difficult to execute. In many cases, acquisition, lease, supplier-credit arrangements or industrial-park entry will be more feasible than structures that depend on Ukrainian co-financing. It means that IFI programs should indirectly aim to widen the local funding possibilities.

Logistics and energy cost and reliability. With pre-war routes disrupted, Ukrainian exports have reorientated toward western land corridors that operate at higher unit cost than the maritime channels they partially replaced. Border crossings remain capacity-constrained during peak periods, and single-route dependence increases exposure to localised disruption. Industrial energy availability is one of the utmost concerns after the grid and generation capacities got hit. So both infrastructural topics demand special attention from the IFIs in fragile situations.

Therefore the new role for the IFIs could be determined by this new landscape, as well as very likely higher demand for reconstruction financing, with Ukraine as an example of such.

A stronger World Bank role in Ukraine's recovery would reflect a return to its historical mission of financing post-war reconstruction and economic stabilisation. The World Bank was created specifically to support post-war recovery. In 1947, it [provided](#) its first-ever USD 250 million loan to France (around USD 7.4 billion in 2026 prices) to finance locomotives, railway cars, electricity generation equipment, power grids, industrial machinery, coal, and steel. Similar reconstruction loans followed for the Netherlands, Denmark, and Luxembourg, bringing total World Bank reconstruction lending in Western Europe to almost USD 500 million. These investments were directed toward rebuilding productive capacity, restoring energy systems, and preventing economic collapse, not toward low-risk or narrowly targeted projects.

Ukraine today requires a similarly strategic and risk-tolerant approach from IFIs. The scale of destruction and transformation needed in Ukraine cannot be addressed through fragmented or overly cautious financing models. IFIs should prioritize sectors

capable of generating long-term economic growth and strategic resilience: electricity grids, energy storage, decentralized generation, logistics corridors, green metallurgy, industrial decarbonization, defense manufacturing, and critical raw materials processing. These sectors may involve higher risks and larger capital needs, but they also create the strongest multiplier effects for economic recovery and European integration.

Effective reconstruction requires more than infrastructure delivery, it demands an integrated vision of how investments will shape a productive, resilient, and future-oriented economy. Sri Lanka is one of the clearest examples, when large-scale infrastructure projects (incl. Hambantota Port and related transport infrastructure) [received](#) billions in external financing despite weak economic integration and limited commercial demand. While the projects expanded physical infrastructure, they generated insufficient economic returns and contributed to severe debt pressures and balance-of-payments vulnerabilities. Later analyses [highlighted](#) that many investments were implemented without adequate assessment of long-term economic viability, export capacity, and fiscal sustainability.

In [Pakistan](#), rapid solar deployment outpaced investments into transmission infrastructure, creating major grid bottlenecks and forcing IFIs to later finance emergency transmission upgrades. The case demonstrated that generation expansion without simultaneous grid modernization can reduce the effectiveness of clean energy investments.

The same integrated approach must guide Ukraine's reconstruction. Renewable energy investments without modern grids, industrial recovery without logistics connectivity, or electrification without generation and storage capacity would weaken the sustainability of reconstruction efforts. IFIs therefore need to move beyond project-by-project lending toward integrated economic transformation strategies combining infrastructure, industrial policy, energy security, and climate resilience.

Post-war Ukraine could become one of Europe's major industrial and energy growth hubs, if IFIs are willing to finance transformation at scale. Energy infrastructure, low-carbon steel production, defense and dual-use manufacturing, transport and logistics corridors, agro-processing, and clean-tech industries all have the potential to become major post-war growth drivers. The challenge for IFIs today is not whether they can finance such reconstruction, but whether they are willing to return to the ambitious role they were originally created to perform after World War II.

Conclusion: Lessons for an uncertain world

Although this report covers a wide range of topics - from governance and fiscal policy to infrastructure, energy, logistics, critical minerals, defence industries and development finance - a number of common themes emerge.

Resilience Is Becoming a Core Economic Objective

Economic policy has traditionally focused on efficiency, cost reduction and optimization. Recent geopolitical, security and economic shocks demonstrate that resilience requires greater attention. Across the areas examined in this report, countries increasingly need systems capable of functioning under disruption. This applies to public finances, energy systems, transport corridors, supply chains and investment frameworks alike. The ability to absorb shocks and recover quickly is becoming an important component of competitiveness.

Redundancy Has Economic Value

Many systems were designed around the assumption that disruptions would be rare and temporary. As a result, spare capacity, backup routes and alternative suppliers were often viewed as inefficient.

Ukraine's experience suggests the opposite. Alternative export routes, reserve energy capacity, multiple logistics options and diversified financing sources helped maintain economic activity when primary systems became unavailable. Building and maintaining such redundancy may involve additional costs, but these costs can be significantly lower than the economic losses associated with system failure.

Adaptability Matters as Much as Capacity

The effectiveness of institutions depends not only on their formal capacity but also on their ability to adjust under changing conditions. Ukraine's wartime experience demonstrates the importance of flexible decision-making, contingency planning, strong local institutions and the ability to modify procedures without losing accountability. Similar challenges are increasingly visible across Europe and other regions facing growing security, fiscal and economic pressures.

For Ukraine, this means that reconstruction should not focus solely on replacing damaged assets. It should strengthen long-term competitiveness in areas where the country has strategic advantages, including energy, logistics, critical minerals, advanced manufacturing and defence-related industries.

For governments and international financial institutions, the key lesson is that policies, infrastructure and financing models increasingly need to be designed for a world where disruptions are more frequent, risks are more diverse and resilience has become an economic asset in its own right.