

INSTITUTIONAL MECHANISMS FOR WAR-RISK COVERAGE

ІНСТИТУЦІЙНІ МЕХАНІЗМИ ПОКРИТТЯ ВОЄННИХ РИЗИКІВ

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Abstract. *Russia's full-scale invasion has fundamentally altered the institutional conditions for investment in Ukraine. The possibility of physical destruction, interruption of operations and loss of access to critical infrastructure cannot be adequately addressed through conventional portfolio diversification or contractual safeguards. War-risk insurance and investment guarantees have therefore become essential determinants of whether foreign direct investment projects can be financed and implemented under continuing hostilities.*

The article examines the current architecture of war-risk coverage available in Ukraine, including the mechanisms provided by MIGA, the United States International Development Finance Corporation, the European Bank for Reconstruction and Development, foreign and Ukrainian export credit agencies, international insurance markets and domestic insurers. The study combines positive and normative economic analysis with institutional comparison of the available instruments, their financial limits, eligibility requirements and principal exclusions.

The findings demonstrate that the emerging system remains multilayered but fragmented. International guarantees and publicly supported reinsurance facilities have expanded the range of insurable transactions, but their capacity remains insufficient for the comprehensive protection of large centralised infrastructure. The exclusion of critical infrastructure from many locally available insurance products creates a structural mismatch between Ukraine's reconstruction needs and the actual risk-bearing capacity of the insurance market.

The article proposes a portfolio-based hybrid model for attracting foreign direct investment into small and medium-sized decentralised energy projects. The model combines primary underwriting by Ukrainian insurers, targeted state support, international guarantees and reinsurance, and a catastrophic state-donor backstop. It is argued that such arrangements may transform war risk into a layered and contractually manageable exposure and influence not only the compensation of losses but also the scale, structure and sectoral allocation of foreign investment in Ukraine's reconstruction.

Keywords: *war-risk insurance; foreign direct investment; political-risk insurance; decentralised energy; investment guarantees; reinsurance; hybrid risk-sharing model; critical infrastructure; reconstruction of Ukraine; international financial institutions.*

Анотація. *Повномасштабне вторгнення Росії докорінно змінило інституційні умови здійснення інвестицій в Україні. Ризики фізичного знищення активів, припинення операційної діяльності та втрати доступу до критичної інфраструктури неможливо належним чином мінімізувати за допомогою звичайної диверсифікації інвестиційного портфеля або договірних механізмів. Страхування воєнних ризиків та інвестиційні гарантії у зв'язку з цим перетворилися на важливі чинники, що визначають можливість фінансування й реалізації проєктів прямих іноземних інвестицій в умовах тривалих воєнних дій.*

У статті досліджено сучасну архітектуру покриття воєнних ризиків в Україні,

зокрема механізми, запропоновані MIGA, Міжнародною фінансовою корпорацією розвитку США, Європейським банком реконструкції та розвитку, іноземними й українським експортно-кредитними агентствами, міжнародними страховими ринками та вітчизняними страховиками. Дослідження поєднує позитивний і нормативний економічний аналіз з інституційним порівнянням доступних інструментів, їхніх фінансових лімітів, критеріїв прийнятності та основних виключень.

Результати засвідчили, що сформована система залишається багаторівневою, але фрагментованою. Міжнародні гарантії та механізми перестрахування з державною і донорською підтримкою розширили коло операцій, які можуть отримати страховий захист, однак їхньої ємності недостатньо для повноцінного покриття великих централізованих інфраструктурних об'єктів. Виключення критичної інфраструктури з багатьох доступних на внутрішньому ринку страхових продуктів створює структурну невідповідність між потребами відбудови України та фактичною здатністю страхового ринку приймати відповідні ризики.

У статті запропоновано портфельну гібридну модель залучення прямих іноземних інвестицій у малі та середні проєкти децентралізованої енергетики. Модель поєднує первинне страхування українськими страховиками, цільову державну підтримку, міжнародні гарантії та перестрахування, а також катастрофічний державно-донорський рівень захисту. Обґрунтовано, що такі механізми можуть трансформувати воєнний ризик у багаторівневий і договірно керований ризик та впливати не лише на компенсацію збитків, а й на масштаби, структуру і секторальний розподіл іноземних інвестицій у відбудову України.

Ключові слова: страхування воєнних ризиків; прямі іноземні інвестиції; страхування політичних ризиків; децентралізована енергетика; інвестиційні гарантії; перестрахування; гібридна модель розподілу ризиків; критична інфраструктура; відбудова України; міжнародні фінансові інституції.

Introduction. Russia's full-scale invasion has created an investment environment in which conventional approaches to risk assessment and capital allocation are no longer sufficient. According to the Fifth Rapid Damage and Needs Assessment, the cost of Ukraine's recovery and reconstruction was estimated at almost USD 588 billion over the next decade as of 31 December 2025, which is nearly three times the country's projected nominal GDP for 2025. Energy accounts for almost USD 91 billion, or approximately 15.4 per cent, of the total identified needs and remains one of the three sectors most severely affected by the war. The scale of these requirements substantially exceeds the capacity of public finance and international assistance alone, making the mobilisation of domestic and foreign private capital indispensable for both wartime recovery and post-war reconstruction (World Bank Group et al., 2026).

The European Union has become Ukraine's principal strategic partner in combining reconstruction finance with the country's accession-related reforms. The EUR 50 billion Ukraine Facility for 2024–2027 links financial support to implementation of the Ukraine Plan, institutional modernisation and progressive approximation to the EU acquis. Its second pillar, the Ukraine Investment Framework, has a capacity of EUR 9.6 billion, including EUR 7.8 billion in guarantee cover and EUR 1.8 billion in blended-finance grants, and is intended to mobilise up to EUR 40 billion in public and private investment. In addition to reducing project risks through guarantees, grants, technical assistance and financial instruments, the Facility promotes the application of EU environmental, governance, reporting and project-selection standards. It should therefore be understood not only as a source of reconstruction finance but also as an institutional mechanism that increases Ukraine's investment capacity while accelerating its integration into the regulatory and economic space of the European Union (European Commission, 2026; Namoniuk, 2026).

The energy sector illustrates the importance of matching investment priorities with the actual capacity of risk-sharing institutions. Large centralised facilities combine high replacement costs, fixed locations, systemic importance and exposure to repeated attacks, which makes comprehensive commercial insurance particularly difficult. Decentralised generation, by contrast, allows capital to be distributed among smaller cogeneration units, modular generating facilities, renewable-energy installations and energy-storage systems located in different communities. These assets do not

eliminate war risk, but their lower individual value, modular replacement and geographical dispersion can reduce the maximum loss generated by a single event while supporting hospitals, municipal services, industrial consumers and district-heating systems. The practical significance of this segment is already increasing: during the preceding eighteen months, Ukraine commissioned 125 MW of new cogeneration capacity representing more than EUR 210 million in estimated direct investment, while regional plans provide for at least 250 additional cogeneration units with a combined capacity of 1.1 GW over the following two years (State Agency on Energy Efficiency and Energy Saving of Ukraine, 2026).

The article aims to assess the current institutional capacity for covering war risks in Ukraine and to develop a portfolio-based hybrid model for attracting foreign direct investment into small and medium-sized decentralised energy projects.

Literature review. The theoretical analysis of foreign direct investment traditionally begins with the factors determining the international allocation of productive capital. Dunning's eclectic paradigm explains international production through the interaction of ownership, location and internalisation advantages (Dunning, 1980). The institutional environment of the host economy forms an important component of location advantage because it affects transaction predictability, the enforceability of contracts and the investor's ability to retain control over productive assets. Under conditions of armed conflict, institutional arrangements also determine whether exceptional risks can be allocated among investors, lenders, insurers and public institutions or must be borne almost entirely by the investor.

This approach is complemented by new institutional economics. North (1990) defines institutions as formal and informal constraints that structure economic interaction and reduce uncertainty. Williamson (1985) relates the choice of governance arrangements to uncertainty, transaction frequency and asset specificity. These categories are especially relevant to investments in energy and infrastructure, which are characterised by high capital intensity, long payback periods, geographical immobility and dependence on particular networks. When the probability of destruction or prolonged interruption increases, conventional contractual mechanisms become insufficient and must be supplemented by guarantees, insurance, reinsurance and public-private risk-sharing arrangements.

War-risk coverage also differs from conventional property insurance because potential losses are spatially correlated and may accumulate rapidly. A single attack may damage several insured objects within the same geographical area, while repeated attacks may generate losses exceeding the capital capacity of individual insurers. The insurability of wartime exposure therefore depends not only on the characteristics of an individual asset but also on geographical accumulation limits, access to international reinsurance and the participation of public or multilateral institutions capable of absorbing exceptional layers of loss. The National Bank of Ukraine identifies limited domestic capitalisation, insufficient loss data and restricted reinsurance capacity among the principal constraints affecting the development of this market (National Bank of Ukraine, 2025).

The relationship between international assistance and private investment provides an additional perspective on reconstruction finance. Freyer, Lishchynskyi and Lyzun (2024) find a statistically positive relationship between both international assistance and FDI, on the one hand, and Ukraine's economic growth, on the other. Their results indicate that international assistance is particularly important for macroeconomic stabilisation, whereas FDI produces a stronger long-term effect through productive investment, technological modernisation and integration into the global economy. International assistance may also create conditions for subsequent private investment when it finances infrastructure, strengthens institutions and reduces the initial risks faced by investors.

Recent Ukrainian research increasingly treats reconstruction finance as an integrated institutional architecture rather than a collection of isolated programmes. Namoniuk (2026) conceptualises green reconstruction finance as an interaction among multilateral and donor mechanisms, the national regulatory ecosystem and market-based channels for capital mobilisation. Within this architecture, the Ukraine Facility performs both a financing and an integration function, while guarantees, blended finance and political- or war-risk coverage influence the cost of capital and investor appetite. This perspective is directly relevant to the present study because effective war-risk coverage requires coordination among external resources, domestic institutions, project pipelines and

private financial intermediaries.

Riabchyn and Oriekhova (2025) examine the priorities and project requirements applied by international financial institutions and development agencies. Their analysis demonstrates that access to reconstruction finance increasingly depends on compliance with environmental and social standards, climate criteria, ESG-related documentation and, in the case of European institutions, the EU Green Deal and Taxonomy principles. Consequently, the technical resilience or insurability of a decentralised energy project does not automatically make it eligible for international financing. The type of technology, emissions profile, environmental and social management arrangements and compatibility with EU standards must also be considered during project selection.

The potential role of guarantees and insurance extends beyond conventional commercial infrastructure. Bulatova and Vyshniakov (2026) argue that the transformation of international humanitarian financing requires combining traditional grants and loans with guarantees, insurance, equity instruments, public–private partnerships and other mechanisms capable of mobilising private capital. They particularly emphasise the relevance of insurance and guarantee instruments for high-risk projects and emergency-response systems, as well as the importance of long-term financing and cross-sectoral cooperation. Their conclusions suggest that layered risk-sharing arrangements may be applicable not only to energy assets but also to healthcare, food security, municipal infrastructure and other sectors operating under conditions of exceptional risk.

The broader economic significance of these mechanisms is connected with Ukraine's participation in international production networks. Shnyrkov and Chugaiev (2017) associate inward foreign investment with regulatory convergence, technology transfer and closer economic integration with the European Union. A prolonged decline in FDI therefore restricts not only capital formation but also access to managerial expertise, foreign suppliers and international markets. War-risk insurance and investment guarantees may influence this process by determining which projects can meet the risk requirements of international lenders and investors.

The institutional configuration of investment relationships is also important. Namoniuk and Maliuha (2026) demonstrate that governance architecture is not neutral, since different organisational arrangements create different incentives for long-term investment, coordination and capability development. Modular governance facilitates standardisation, replication and the replacement of individual components, while relational governance supports deeper cooperation and joint capability formation. Although their analysis concerns green outsourcing, the distinction is applicable to decentralised energy: standardised assets can be grouped into diversified portfolios, but the operation of a risk-sharing system requires sustained relationships among investors, insurers, equipment suppliers, municipalities, the state and international financial institutions.

The existing literature nevertheless remains fragmented. Research on FDI primarily examines location advantages and institutional quality; studies of recovery finance focus on international assistance, blended finance or sustainable investment; and official programme documents describe individual insurance and guarantee mechanisms. Limited attention has been paid to how the financial limits of war-risk coverage affect the appropriate scale and technological structure of energy investment. There is also insufficient research on how exposure associated with portfolios of decentralised assets should be distributed among investors, Ukrainian insurers, the state, international financial institutions and donor partners. The present article addresses this gap by combining positive analysis of the mechanisms currently available in Ukraine with a normative portfolio-based model of hybrid war-risk coverage..

Methodology. The study applies a qualitative institutional approach combining positive and normative economic analysis. The positive component identifies and compares the principal mechanisms of war-risk coverage currently available in Ukraine. The source base includes academic literature on foreign direct investment, institutional economics and global value-chain governance, as well as official materials published by the National Bank of Ukraine, MIGA, DFC, the EBRD, Marsh McLennan and other institutions participating in the provision of guarantees, insurance and reinsurance. The examined mechanisms are compared according to their principal object of coverage, eligible investors and assets, reported financial capacity, maximum liability, institutional distribution of risk and geographical or sectoral restrictions.

The normative component uses the limitations identified through the positive analysis to

develop a portfolio-based hybrid model for small and medium-sized decentralised energy projects. The model is constructed through institutional comparison and analytical synthesis rather than actuarial estimation. Particular attention is paid to the correspondence between the value and geographical distribution of decentralised assets and the actual limits of insurance, guarantee and reinsurance instruments. The financial indicators reported by different institutions are not treated as directly comparable values, since they may refer to the amount of a guarantee, total facilitated insurance capacity, aggregate programme exposure or a maximum limit per object. The mapping of insurance products and war-risk facilities reflects the institutional information reported by the National Bank of Ukraine as of October 2025, while the assessment of reconstruction needs, the Ukraine Facility and decentralised-energy developments is updated through the first half of 2026. The study therefore combines a fixed comparative date for insurance-market capacity with more recent contextual data on reconstruction and investment policy.

Main results of the research. Russia's full-scale invasion has transformed war-risk insurance from a specialised market segment into one of the key institutional conditions for investment activity in Ukraine. Under normal circumstances, investors may respond to political or macroeconomic uncertainty by diversifying their portfolios, demanding higher returns, shortening investment horizons or introducing additional contractual safeguards. These measures become considerably less effective when the principal risk involves the physical destruction of productive assets, a prolonged interruption of operations or the permanent loss of access to transport and energy infrastructure. The materialisation of wartime risks may therefore eliminate not only the expected income stream from an investment but also the capital embodied in fixed and geographically immobile assets.

The institutional consequences of this reduction in the risk-mitigation capacity of conventional capital markets can be explained through the propositions of new institutional economics. Institutions reduce uncertainty and structure the incentives of economic actors, while the governance arrangements selected for a transaction depend on its level of uncertainty, frequency and asset specificity (North, 1990; Williamson, 1985). In the case of foreign direct investment, the quality of the institutional environment forms part of the location advantages considered by multinational enterprises when deciding where to place productive capital (Dunning, 1980). Investment guarantees and war-risk insurance consequently affect not only the compensation available after an insured event but also the ex-ante distribution of exposure among investors, lenders, insurers, reinsurers, the state and international financial institutions.

The significance of these mechanisms for Ukraine extends beyond the immediate reconstruction of destroyed capital. Shnyrkov and Chugaiev (2017) demonstrate that foreign investment inflows are an important condition for Ukraine's integration into international production networks and closer economic engagement with the European Union. A prolonged decline in investment therefore restricts not only domestic capital formation but also access to technologies, managerial expertise and foreign markets. Namoniuk and Maliuha (2026), in turn, emphasise that the governance architecture of global value chains is not neutral: different institutional configurations create different incentives for long-term investment, coordination and capability development. Applied to wartime reconstruction, this proposition implies that a collection of isolated insurance products is insufficient. A coherently configured architecture is required to distribute exceptional risks among public and private actors.

The emerging Ukrainian war-risk insurance architecture remains multilayered and fragmented. It includes political-risk guarantees for foreign investment provided by multilateral and bilateral development institutions; publicly supported reinsurance facilities; inland, maritime and international cargo insurance; export-credit instruments; products offered by individual Ukrainian insurers; and insurance arrangements embedded in bank lending. Although these mechanisms support reconstruction and investment through different channels, they vary substantially in terms of eligible investors, covered assets, geographical limitations, policy periods and maximum liabilities. They should therefore be regarded as complementary rather than interchangeable instruments (National Bank of Ukraine, 2025).

One of the principal multilateral institutions capable of providing political-risk insurance for foreign investors in Ukraine is the Multilateral Investment Guarantee Agency, a member of the World Bank Group. MIGA's mandate includes protection against war and civil disturbance, expropriation,

currency-conversion and transfer restrictions, breach of contract and the non-honouring of financial obligations. Such protection is especially important where private insurers and reinsurers are unwilling to assume exposure independently. MIGA combines donor-supported resources, its own guarantee capacity and, where available, public or private reinsurance, thereby reducing the concentration of risk on a single institutional balance sheet (MIGA, 2023).

According to the mapping prepared by the National Bank of Ukraine as of October 2025, the relevant MIGA instruments covered investments in Ukraine with a reported financing amount exceeding USD 30 million, while the indicative limit under one contract amounted to approximately USD 9.2 million (National Bank of Ukraine, 2025). The guarantees are concluded individually and can be structured with reference to the ownership, financing arrangements and risk profile of a particular investment. Such individual underwriting allows the instrument to reflect project-specific conditions but also requires a high degree of investment readiness, due diligence and transaction documentation.

MIGA consequently performs a catalytic rather than universal market function. Its participation may unlock equity or debt financing that would otherwise remain unavailable and may signal that the project has passed environmental, social, integrity and financial assessments. However, the project-by-project structure makes the instrument less accessible and less cost-efficient for standardised micro, small and medium-sized investments or widely distributed small-scale infrastructure projects.

A different mechanism has been developed by the United States International Development Finance Corporation with the participation of Aon. The arrangement uses public risk-bearing capacity to support reinsurance and enable Ukrainian insurers to expand the coverage offered to businesses operating in Ukraine. According to the National Bank of Ukraine, the total potential capacity associated with the mechanism exceeded USD 250 million, while the coverage limit for an individual object amounted to USD 2.5 million. Participating insurers are required to have transparent ownership structures and audited financial statements (National Bank of Ukraine, 2025).

The institutional significance of this mechanism lies in its reliance on the existing Ukrainian insurance market. Domestic insurers continue to assess risks, issue policies, collect premiums and settle claims, while DFC-supported reinsurance limits the losses that they must retain on their own balance sheets. The arrangement therefore restores part of the risk-transfer chain disrupted by the withdrawal of international reinsurance capacity following the full-scale invasion. DFC's commitment of USD 50 million in political-risk insurance was intended to unlock more than USD 200 million of additional coverage for static assets in Ukraine (DFC, 2024).

The USD 2.5 million limit per object determines the segment in which this mechanism can operate most effectively. It may provide meaningful protection for inventories, machinery, vehicles, smaller buildings and individual components of local infrastructure. It cannot, however, cover the replacement value of a large industrial plant, centralised power station or systemically important infrastructure facility. The instrument expands the frontier of insurability but does not eliminate the gap between commercially manageable business risks and highly concentrated strategic exposures.

The European Bank for Reconstruction and Development has introduced a similar mechanism focused on restoring international reinsurance capacity. The Ukraine Recovery and Reconstruction Guarantee Facility, developed by the EBRD and Aon, enables international reinsurers to cover defined war-related losses initially underwritten by Ukrainian insurance companies. The facility deliberately relies on the existing insurance infrastructure rather than establishing a parallel system. Its initial eligible categories include inland cargo, motor vehicle damage and railway rolling stock (EBRD, 2024).

The facility is supported by an EBRD guarantee of up to EUR 110 million. Because the underlying policies are generally short-term and may be renewed, the committed guarantee capital can support a substantially larger volume of insured assets. The EBRD estimated that the mechanism could facilitate coverage for up to EUR 1 billion of goods and vehicles in transit annually. In the mapping prepared by the National Bank of Ukraine, the available capacity associated with commercial goods transported within Ukraine was presented at EUR 200 million (National Bank of Ukraine, 2025). The distinction between the guarantee amount and the value of facilitated coverage is important: the former represents the maximum institutional commitment, while the latter reflects

the larger volume of transactions supported through risk sharing, portfolio turnover and the repeated use of the facility.

International reinsurance is required because Ukrainian insurers cannot independently absorb substantial and geographically concentrated losses. Unlike ordinary property risks, wartime exposure may accumulate rapidly: a single attack may damage several insured objects within the same area. The EBRD mechanism addresses this problem by distributing defined layers of exposure among Ukrainian insurers, international reinsurers, the EBRD and donor governments. The commencement of underwriting by INGO, Colonnade and UNIQA, supported by MS Amlin and the EBRD guarantee facility, demonstrated the operational viability of this public–private risk-sharing structure (EBRD, 2025).

A separate institutional mechanism has emerged in maritime insurance. The Unity facility, arranged with the participation of the Government of Ukraine, Marsh McLennan, Ukrainian state-owned banks, the Ukrainian Export Credit Agency and underwriters operating in the Lloyd's market, initially provided affordable war-risk insurance for grain and other food exports from Ukrainian Black Sea ports. It was subsequently extended to ocean-going vessels carrying other categories of non-military cargo, including steel, iron ore, electrical equipment and containerised goods (Marsh McLennan, 2023; 2024).

The facility offers up to USD 50 million of hull and separate protection and indemnity war-risk coverage. Standby letters of credit issued by Ukreximbank and Ukrgasbank and confirmed by DZ Bank form a first-loss layer supported by the Government of Ukraine. State participation reduces the exposure retained by private underwriters and facilitates the provision of insurance at premiums lower than those available through conventional commercial arrangements.

Unlike MIGA or DFC-supported mechanisms, the Unity facility does not directly protect the capital invested in a manufacturing or energy facility. Its economic function is to preserve the continuity of maritime trade and reduce the operational risks faced by exporters, shipowners and charterers. This function remains relevant to FDI because the commercial viability of a productive asset depends on continued access to foreign suppliers and buyers. Maritime war-risk insurance may therefore complement direct investment protection by reducing the probability that productive assets become commercially stranded as a result of disrupted logistics.

Export credit agencies constitute another component of the emerging architecture. According to the National Bank of Ukraine, foreign ECAs had provided more than EUR 1 billion in aggregate support for foreign investment and related transactions in Ukraine by October 2025. Depending on their mandate, ECAs may insure investments, loans, equipment supplies and contractor exposures where a transaction serves the national economic interests of the guarantor state.

The scale of ECA support may be substantial, but access is commonly linked to the participation of companies, lenders or exporters from a particular partner country. The Ukrainian Export Credit Agency may insure direct investments and investment loans associated with the establishment or modernisation of processing facilities producing goods for export. The coverage limit under one contract amounted to UAH 200 million (National Bank of Ukraine, 2025). Unlike general property insurance, this mechanism connects risk protection with structural transformation and export capacity. Its use remains limited by the export orientation of the project, the statutory mandate of the Agency and its available financial capacity.

Table 1

International mechanisms of war-risk coverage available in Ukraine

Institution or mechanism	Principal object of coverage	Reported financial capacity and limit	Principal conditions and institutional characteristics
MIGA	Foreign investments in Ukraine	More than USD 30 million; approximately USD 9.2 million per contract in the NBU mapping	Individually negotiated guarantees; foreign investor and project-level due diligence
DFC with Aon	Static property and	More than USD 250	Reinsurance through

	transport assets	million; up to USD 2.5 million per object	eligible Ukrainian insurers; transparent ownership and audited reporting
EBRD with Aon	Inland cargo, motor vehicles and railway rolling stock	EUR 200 million of cargo coverage reported by the NBU; EBRD guarantee of up to EUR 110 million	Ukrainian primary insurers, international reinsurers and multilateral guarantee capacity
Lloyd's insurers with Marsh McLennan	Ships and non-military cargo transported through Ukrainian maritime corridors	Up to USD 50 million of hull and separate P&I coverage	Public-private first-loss structure; Ukrainian banks and government support
Foreign ECAs	Foreign investments, investment loans, equipment and contractor exposures	More than EUR 1 billion in aggregate	Connection with exporters, investors or lenders from the respective guarantor state
Ukrainian ECA	Direct investments and investment loans in export-oriented processing	Up to UAH 200 million per contract	Investment must support production of goods intended for export

Source: compiled by the author based on National Bank of Ukraine (2025), DFC (2024), EBRD (2024), MIGA (2023), and Marsh McLennan (2023; 2024).

Despite the development of international mechanisms, the capacity of the Ukrainian insurance market remains limited. As of October 2025, war-risk coverage was provided only by individual companies among the 60 insurers operating in Ukraine. The principal constraints include the high probability and potential severity of losses, insufficient capitalisation of domestic insurers and limited access to international reinsurance. More than 77,000 contracts containing elements of war-risk coverage were concluded during 2022–2025. However, the structure of this portfolio indicates that market adaptation has concentrated primarily on standardised and comparatively low-value assets, particularly motor vehicles and selected categories of movable and immovable property (National Bank of Ukraine, 2025).

The approximate coverage limit offered directly by Ukrainian insurers amounted to UAH 10 million per object or insured event. A bank-linked programme involving Raiffeisen Bank, ARX, Universalna, INGO and Aon provided a limit of UAH 20 million per object or contract. Such instruments may protect individual units of equipment, inventories or relatively small business facilities and may facilitate lending by preserving the value of pledged property. Their capacity remains insufficient, however, to cover the replacement value of large industrial or energy assets.

The most consequential restriction concerns the eligibility of insured objects. Commercial products offered by the Ukrainian insurance market generally exclude assets located in areas of active hostilities and impose strict requirements intended to prevent excessive geographical accumulation of exposure. The exclusions identified by the National Bank of Ukraine also include objects classified as critical infrastructure. This creates a structural mismatch between the sectors in which protection is most necessary and those in which commercial coverage is practically available. Large energy facilities are capital-intensive, fixed in particular locations, systemically important and exposed to the possibility of repeated attacks, making their risks difficult to diversify within the capacity of private insurers.

The positive analysis therefore demonstrates that the existing architecture does not provide universal protection for capital investment in Ukraine. Many locally available products are more compatible with small and medium-sized projects, standardised contracts and relatively limited maximum losses per insured event than with large centralised infrastructure facilities. This observation provides the basis for adjusting the approach to attracting FDI into Ukraine's energy sector. Alongside the restoration of large strategic assets, investment policy should prioritise

portfolios of small and medium-sized decentralised energy projects whose financial and risk characteristics correspond more closely to the actual capacity of insurance and guarantee mechanisms.

The proposed reorientation does not imply that decentralised energy assets are free from war risks or automatically fall outside the legal category of critical infrastructure. Their eligibility must be assessed according to their function, location and formal regulatory status. Nevertheless, decentralised projects possess several characteristics that make their risks more compatible with the existing institutional capacity. The value of an individual unit is lower, assets can be distributed among several locations, damaged equipment may be replaced modularly, and the destruction of one installation does not necessarily interrupt the operation of the entire energy system.

This logic is applicable to cogeneration units, modular gas-engine generation, small renewable-energy installations combined with storage, and local biomass or biogas facilities serving municipalities, hospitals, industrial enterprises and district-heating systems. Instead of concentrating capital in one large and indivisible asset, an investor may form a portfolio of smaller and technically standardised installations. Geographical and technological diversification would cap the maximum probable loss associated with a single event and make it more feasible to align the insured value of each unit with the limits available under existing risk-coverage mechanisms.

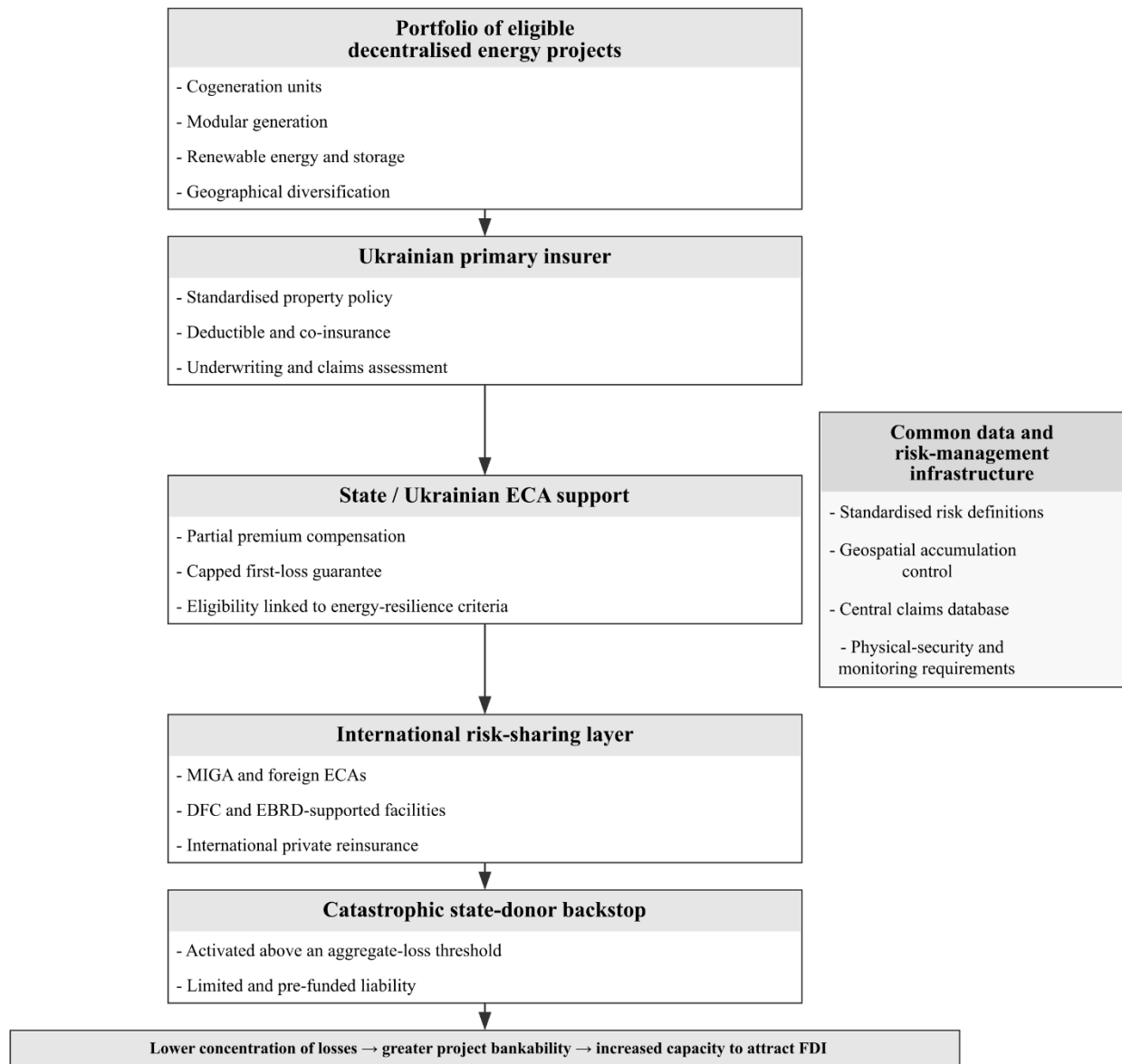
At the asset level, the proposed portfolio may comprise several technically distinct but institutionally comparable project categories. High-efficiency cogeneration units can provide electricity and heat to hospitals, municipal utilities, district-heating systems and industrial consumers. Modular gas-engine or turbine units may supply reserve or balancing capacity, while renewable-energy installations combined with battery storage can support local consumption, reduce dependence on a single external connection and facilitate the integration of variable generation. Biomass and biogas facilities may additionally connect local energy production with agricultural and municipal waste-management systems. In each case, the relevant unit for insurance purposes should be an individually replaceable installation rather than the entire municipal or regional energy system.

The composition of the portfolio should nevertheless reflect both insurance criteria and the requirements of prospective financiers. Relevant underwriting variables include the replacement value and location of each unit, the geographical distance between insured assets, physical protection, remote monitoring, access to spare parts, expected replacement time, redundancy and the ability to operate independently from the main network. International-finance eligibility may introduce additional environmental and social requirements. In particular, gas-based generation may strengthen short-term energy resilience but will require project-specific assessment of its efficiency, emissions profile and consistency with the applicable EU and international-financial-institution criteria. Renewable generation, storage, high-efficiency cogeneration and projects producing measurable local resilience effects may be more readily combined with the green and blended-finance instruments available under the European reconstruction architecture (Riabchyn and Oriekhova, 2025; Namoniuk, 2026).

The institutional arrangement for such projects should also be developed on a portfolio basis. Grouping technically comparable projects within a single programme would allow risks to be diversified across locations and operators while reducing the cost of underwriting, due diligence and transaction structuring. Standardised contracts and eligibility requirements could create a scalable project pipeline rather than a succession of individually negotiated transactions. A hybrid approach would combine the local market's knowledge of Ukrainian assets and operators with the greater financial capacity of international institutions and reinsurers.

Figure 1

Proposed hybrid model of war-risk coverage for decentralised energy projects in Ukraine



Source: developed by the author

The proposed model contains four risk-sharing layers. The first layer consists of a standardised property insurance policy issued by an eligible Ukrainian insurer. The investor or project operator retains part of the exposure through a deductible and, where appropriate, co-insurance. The Ukrainian insurer performs the primary underwriting, policy-administration and claims-assessment functions.

The second layer consists of targeted state support administered through the Ukrainian Export Credit Agency or another authorised institution. Such support may take the form of partial premium compensation or a capped first-loss guarantee. It should not provide unlimited compensation, as the investor, operator and insurer must retain incentives to apply adequate physical-protection, cybersecurity, redundancy and emergency-response measures.

The third layer comprises international guarantees and reinsurance provided through MIGA, DFC, the EBRD, foreign export credit agencies and private international reinsurers. These institutions would not necessarily insure each project directly. Their role would be to absorb predefined layers of losses exceeding the retention capacity of Ukrainian insurers and the state-supported first-loss mechanism.

The fourth layer is a catastrophic state–donor backstop. It would be activated only when aggregate losses exceed a predetermined threshold and would be financed through donor contributions, a dedicated reserve or another pre-funded arrangement. Separating this catastrophic layer from ordinary insurance and first-loss support would limit the open-ended fiscal liability of the state while protecting the system against the accumulation of exceptionally severe losses.

The model therefore distributes exposure among the institutions most capable of managing each category of risk. Investors and project operators retain a limited share through deductibles and co-insurance; Ukrainian insurers provide market access, underwriting and claims management; the state addresses the initial gap between commercial supply and socially important demand; and international institutions and reinsurers supply capacity for larger and accumulated losses. The catastrophic state–donor backstop remains a separate final layer rather than an obligation imposed on conventional private insurers.

State participation should be targeted rather than universal. Premium subsidies and first-loss support may be restricted to projects that make a measurable contribution to local energy resilience. The amount of support could depend on the geographical risk category, the share of private capital, the degree of technical standardisation and the ability of the installation to provide electricity or heat during disruptions of the centralised system. Deductibles and co-insurance should be retained to ensure that beneficiaries continue investing in protective structures, cybersecurity, reserve capacity and emergency-response planning.

The development of a niche insurance programme would also require a unified methodology for assessing decentralised energy risks. This methodology should include standard definitions of insured events, uniform approaches to asset valuation, geographical accumulation limits, minimum physical-security and remote-monitoring requirements and procedures for rapid claims verification. A centralised database of insured locations and losses would allow insurers and reinsurers to monitor excessive concentration and gradually develop the actuarial information currently missing from the market. The National Bank of Ukraine identifies the absence of reliable data, insufficient market capacity and the need for niche products, hybrid arrangements and the adaptation of international experience among the principal directions for cooperation (National Bank of Ukraine, 2025).

International experience should not be transferred to Ukraine through the mechanical replication of a single model. The options examined by the National Bank of Ukraine include a state compensation mechanism; a dedicated fund financed through targeted payments, following the Israeli approach; a specialised second-level reinsurer comparable to the French model; and arrangements used in South Africa, Spain and New Zealand in which private insurers distribute standardised coverage as agents while a separate institution bears the underlying war-risk exposure.

A combination of these elements appears more appropriate for Ukraine. During active hostilities, the immediate priorities should be partial premium compensation, a capped first-loss facility and the use of Ukrainian insurers as underwriting and distribution agents. As the security situation improves and international reinsurance becomes more accessible, the system may gradually shift towards a specialised reinsurance mechanism that centrally places accumulated Ukrainian war risks on international markets. The model should therefore be transitional and capable of adapting to changing security conditions rather than becoming permanently fixed as either a fully state-controlled or a purely private arrangement.

The proposed approach can also be interpreted through the distinction between modular and relational governance discussed by Namoniuk and Maliuha (2026). Their analysis does not directly prescribe a model for war-risk insurance; however, it provides a useful conceptual basis for the present study. Standardisation and portfolio formation introduce modularity at the project level, making individual installations easier to replicate, replace and finance. At the same time, the sustained participation of insurers, foreign investors, equipment suppliers, municipalities, the state and international financial institutions creates the relational governance required for joint investment, information exchange and the long-term development of institutional capacity.

The attraction of FDI should also be connected not only with the import of equipment but with the deeper integration of Ukrainian firms into international production networks. Shnyrkov and Chugaiev (2017) emphasise the importance of foreign investment and institutional convergence for Ukraine's participation in cross-border production. A portfolio-based programme for decentralised energy may therefore combine capital protection with technology transfer, local maintenance, component manufacturing and long-term cooperation between Ukrainian enterprises and foreign suppliers.

Accordingly, the normative objective of Ukraine's insurance and investment policy should not be the complete elimination of war risk, which remains impossible while hostilities continue. The

objective should be to transform this risk into a layered and contractually manageable exposure distributed among projects, investors, insurers, the state and international institutions. The combination of project standardisation, portfolio diversification, domestic underwriting, targeted state participation and international reinsurance may expand the range of energy investments that satisfy the risk requirements of foreign investors. Institutional mechanisms of war-risk coverage should therefore be understood not only as instruments for compensating losses but also as determinants of the scale, structure and sectoral direction of FDI in Ukraine's reconstruction.

Conclusions. The analysis demonstrates that war-risk insurance has become an integral part of Ukraine's investment environment rather than a narrowly specialised financial service. Under conditions of continuing hostilities, the risk of physical destruction, operational interruption and loss of access to infrastructure cannot be adequately addressed through conventional investment diversification or contractual safeguards alone. The availability of guarantees, insurance and reinsurance consequently affects not only the compensation of losses after an insured event but also the initial feasibility, financing structure and geographical allocation of foreign direct investment.

The principal findings of the article can be summarised in four propositions. First, the existing architecture of war-risk coverage in Ukraine is institutionally diverse but fragmented. MIGA, DFC, the EBRD, foreign export credit agencies, Lloyd's market participants, Ukrainian insurers and commercial banks perform different and complementary functions. Some mechanisms protect foreign investment against political violence and other non-commercial risks; others restore reinsurance capacity, support transport and export operations or protect collateral within bank-financed projects. The presence of several instruments therefore does not amount to universal coverage, since each mechanism remains restricted by its mandate, eligibility requirements, geographical scope and financial limits.

Second, the positive analysis reveals a persistent mismatch between the structure of available insurance capacity and the structure of Ukraine's reconstruction needs. The international mechanisms considered in the article have expanded the range of insurable transactions and demonstrated that public guarantees can mobilise private underwriting and reinsurance. Nevertheless, their per-project and per-object limits remain considerably lower than the replacement cost of large industrial and energy facilities. The domestic market faces even stronger constraints arising from limited capitalisation, insufficient reinsurance capacity and the high concentration of potential wartime losses. The exclusion of critical infrastructure from many locally available insurance products intensifies this mismatch: the assets most important for the functioning of the economy are also among the assets least compatible with conventional commercial underwriting.

Third, these limitations provide an economic rationale for supplementing investment in large strategic infrastructure with portfolios of small and medium-sized decentralised energy projects. Decentralisation does not eliminate war risk, nor does it automatically remove energy assets from the legal category of critical infrastructure. However, it changes the financial and spatial configuration of exposure. Smaller units require less capital per installation, can be geographically and technologically diversified, may be replaced modularly and reduce the probability that the loss of one asset will interrupt the operation of the entire system. Cogeneration units, modular gas-engine facilities, renewable-energy installations combined with storage and local biomass or biogas projects may therefore correspond more closely to the limits and risk-distribution capacity of the emerging insurance architecture.

Fourth, the study proposes that war-risk coverage for decentralised energy should be organised through a portfolio-based hybrid model rather than through the isolated insurance of individual projects. The model combines four risk-sharing layers: primary underwriting by Ukrainian insurers; targeted state support through premium compensation or a capped first-loss facility; international guarantees and reinsurance; and a catastrophic state-donor backstop activated only when aggregate losses exceed a predetermined threshold. Such an arrangement does not seek to transfer all risk to the state or international partners. Instead, it allocates different layers of exposure to the institutions most capable of managing them, while retaining deductibles, co-insurance and eligibility requirements to preserve incentives for physical protection, cybersecurity, redundancy and responsible project management.

The proposed model also has broader implications for the attraction of FDI. Standardisation

and portfolio formation can reduce due-diligence and transaction costs, facilitate the participation of commercial banks and international financial institutions and create a scalable pipeline of investment projects. At the same time, sustained cooperation among Ukrainian insurers, municipalities, foreign investors, equipment suppliers, the state and international partners can support not only capital protection but also technology transfer, local maintenance, component manufacturing and the integration of Ukrainian enterprises into international production networks. War-risk coverage should therefore be regarded not merely as a compensatory mechanism but as an institutional instrument capable of influencing the scale, structure and sectoral direction of foreign investment.

Although the proposed model is calibrated to the characteristics of decentralised energy, its institutional logic is not limited to the energy sector. It may be adapted to portfolios of geographically dispersed and individually replaceable assets in municipal water and heat supply, healthcare, food processing, agricultural infrastructure, logistics, communications and emergency-response systems. The conditions for such scaling include the possibility of standardising project requirements, limiting the maximum loss per individual asset, establishing measurable public or economic benefits and creating a portfolio sufficiently diversified to prevent excessive accumulation of exposure. The model therefore addresses a broader practical problem: the mobilisation of private capital for socially important projects that remain too risky for conventional insurance but do not require the full risk to be assumed by the state. This intersectoral potential corresponds to the broader transition towards innovative financing, public–private cooperation and insurance-supported risk sharing identified by Bulatova and Vyshniakov (2026).

The proposed approach has several limitations. The available insurance data remain incomplete, the market is evolving rapidly and the financial limits and eligibility conditions of individual programmes may change together with the security environment and the participation of donor institutions. The article also does not provide an actuarial estimation of premiums, expected losses or the fiscal cost of the proposed state-supported layers. Moreover, the practical insurability of a particular decentralised energy asset will depend on its location, legal status, technical characteristics and possible classification as critical infrastructure.

Further research should focus on the empirical and actuarial calibration of the proposed model. This includes estimating probable maximum losses for different categories of decentralised energy assets, determining appropriate deductibles and first-loss thresholds, assessing replacement periods and spare-equipment requirements, and examining the influence of geographical and technological diversification on portfolio losses. A comparative analysis of the Israeli, French, Spanish, South African, New Zealand and other national war-risk arrangements would provide an additional basis for selecting the appropriate institutional structure for Ukraine. Further studies should also test the scalability of the model in healthcare, municipal infrastructure, logistics, agriculture and emergency-response systems. These directions would make it possible to move from the conceptual model developed in this article towards operational sectoral and cross-sectoral mechanisms for attracting foreign direct investment under conditions of exceptional risk.

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