

Capstone Report

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# Green Horizon Fund for Ukraine

*Derisking Private  
Sector Investment  
in Green Energy  
Infrastructure*

Willy Brandt School of Public Policy  
University of Erfurt

Novita Andari, Sourav Dhungana, Benjamin Fox, Julia Korn,  
William McNeill, Agatha Moar, Sharmaine Salazar, Aditi Tyagi



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# Executive Summary

## Funding a Green Recovery of Ukraine

With Russia's aggression continuing, Ukraine currently faces a decision about the shape their rebuild will take: **replace, or transform?** There is major upheaval of the economy, communities and infrastructure, and an existential threat. The temptation is to take the path of least resistance, replace existing infrastructure and continue with business as usual. However, there is also an opportunity to harness the groundswell of international support and apply resources towards a transformative rebuild. One which sets Ukraine up for a sustainable future that is integrated with the European Union and aligned with global environmental protection standards. Herein lies the opportunity and the challenge: **rather than building back, build forward.**

With no end to the war in sight, **funding such a vision carries higher financial risk** than other ventures aimed at greening the economy in peaceful conditions. Investors are deterred by ongoing war and the risk of destruction, as well as the economic uncertainty that comes with renewable energy projects. Additionally, with

jobs and production capacity currently limited, the return on investment is dubious.

This is where the **Green Horizon Fund for Ukraine (GHF4U)** provides relief. The fund strives to derisk green electricity infrastructure projects to attract private investment. To ensure priority driven and targeted investment, the fund is aimed exclusively at the **electricity infrastructure** sector. Included in the fund are financial instruments which use **public resources to leverage private investment.**

The operating model is a seven-step process which begins with sourcing projects, filtered by **'green' and 'transformative' eligibility criteria**, before applying financial supports to reach the end goal: a repository of bankable projects. The organisational structure defines a clear operating model and the responsible levels of governance involved to ensure the fund is a beacon of transparency, robust in implementation, and productive in rebuilding Ukraine.

The European Bank for Reconstruction and Development (EBRD) is an ideal fit for the dual roles of fund manager and guarantor, with expertise and experience in fund implementation. The Board of Directors guides decision-making, comprising of donor representatives, the European Commission, and the Ukrainian government, informed by observers such as the World Bank and civil society organisations. The Energy Community features as an external body providing high level policy and legal advice to the Board.

GHF4U was developed through the analysis of multiple other funds which are either aimed at infrastructure development in suboptimal investment conditions, or which respond to a conflict or crisis. It draws on lessons from the analysed funds by identifying characteristics such as financial instruments, and structural and governance features, which either enabled or hindered their mandates. These helped build the GHF4U fund design, which includes tools that the fund manager can employ to **ensure effective use of resources while derisking investment and rendering projects bankable.**

The nature of the fund is distinct, it shifts attention away from a band-aid approach to mid- to long-term solutions. This fund fills a gap, operating to pool funds from public sources to attract private investment, ensuring it meets Ukraine's long-term needs. It builds forward, towards an adaptable and green Ukrainian horizon.

## 1. Why Ukraine needs a transformative fund

On February 24, 2022, Russia invaded Ukraine. Since then, a state of war has persisted, with catastrophic loss of life, but also infrastructure, primarily on Ukrainian soil. With ongoing destruction, Ukraine faces a massive need for rebuild. As of March 2023, the estimated cost of reconstruction and recovery in Ukraine has grown to about EUR 383 billion (World Bank et al., 2023) This figure, 2.6 times Ukraine's total GDP, will only increase, especially while the war continues (The World Bank, 2022b; World Bank et al., 2023). Public money will not suffice, and most of the rebuild requires private sector funding.

The ongoing war makes investing in Ukraine particularly risky, rendering the investment environment unattractive for private investors. Current investments in non-military assets are primarily from public donors, targeting immediate repair. The Ukraine Energy Support Fund is a prime example. However, investment into Ukraine beyond current needs is lacking. Without mid- to long-term investment, Ukraine's economic recovery will not happen. More fundamentally, there is a risk that the prevalent 'band-aid' financing unintentionally creates path dependencies limiting Ukraine's future development.

Ukraine's future depends on what Ukraine's rebuild looks like. Limiting it to replacing what was destroyed risks building toward a pre-war

Ukraine rather than a future-oriented Ukraine. This could lock Ukraine into an inefficient and outdated energy infrastructure and carbon-based economy. Ukraine could find itself being a carbon intensive state in a post-carbon world, with reduced trade potential and diminishing economic competitiveness. The imperative is to already identify, fund and implement future-proof projects – even as the war is still waging.

We envision a future-oriented Ukraine as prosperous, running on an efficient green economy, meeting climate commitments, and perhaps exporting green energy to Europe and other trade partners. To achieve this, Ukraine's rebuild calls for a green mandate. To ensure local buy-in, a green future needs to be financially and socially attractive to Ukrainians. Projects without public support are neither sustainable nor desirable. The successful green reconstruction therefore requires a transformative component, enhancing socio-economic conditions in Ukraine.

This report presents a multi-donor fund, designed to reduce private investor risk to stimulate investment into Ukraine's mid- to long-term reconstruction – the Green Horizon Fund for Ukraine (GHF4U). Based on a green and transformative mandate, the fund serves as a beacon of transparency, lighting the way to a future-facing Ukraine.

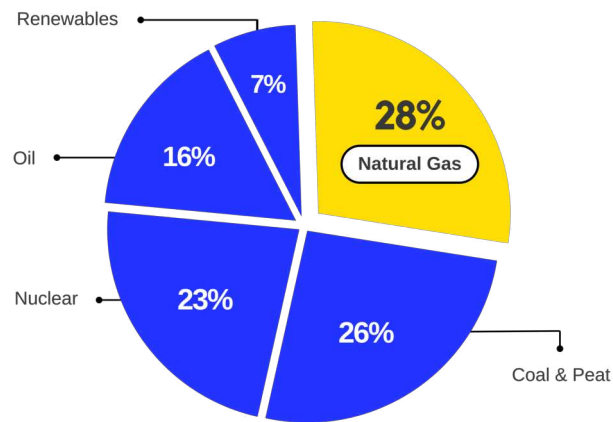


## 2. Ukraine's energy landscape

### 2.1. Pre-War baseline

Before the war, the energy sector played a key role in Ukraine's economic growth, comprising around 17 percent of GDP. The entire population had access to electricity and 94.9 percent had clean cooking fuel. The gas distribution network serviced 74 percent of the population (UNDP et al., 2023).

Figure 1: Ukraine's energy mix (2020)



Source: World Bank (2023)

In 2020, Ukraine's energy mix largely comprised of natural gas, coal and peat, and nuclear (World Bank, 2023). Large investments are needed to modernise Ukraine's electricity generation capacity, particularly in hydro and thermal power plants. This is necessary to remove bottlenecks in high-voltage transmission capacity and to reduce distribution system losses. (International Energy Agency (IEA), 2020).

Electricity transmission and distribution inefficiencies was already high pre-invasion, reaching nearly 20% in some years (International Energy Agency (IEA), 2020). In 2023, 12 million people across Ukraine had no or limited electricity, disrupting internet communications, water supplies, and heating systems (UNDP et al., 2023). Losses in generation, transmission and distribution are expected to increase without sufficient and timely investments in infrastructure (International Energy Agency (IEA), 2020). Each of the 32 regional distribution system operators report to the National Energy and Utilities Regulation Commission on losses and outages on a regular basis. However, quality-of-service standards related to outages have not yet been implemented (International Energy Agency (IEA), 2020).

Swift planning, acquisition, and implementation of supplementary capacity is imperative for maintaining continuous functionality of district heating, water supply, and sewage systems, especially during blackouts or extensive power supply constraints. This would also enhance the overall stability and resilience of the Integrated Energy System of Ukraine by offering additional flexible capacity for the grid (UNDP et al., 2023).

### 2.2. Effects of the war

The Ukrainian energy system has been a primary target of Russia's war campaign. Missile and drone attacks on Ukraine have

reduced the electricity generation capacity by around 75 percent. As of April 2023, Ukraine produces only 13.9 GW of electricity compared to its pre-war state of 56 GW (UNDP et al., 2023). The ongoing conflict has severely damaged the high-voltage power grid, which transmits electricity from Zaporizhzhia Nuclear Power Plant, which itself is under Russian occupation and risks future damage from the war (UNDP et al., 2023). The destruction of said infrastructure hinders the efficient transmission of electricity from the western regions to the east. Overall, 41 out of 94 critical high-voltage transforming substations in government-controlled territories have sustained damage or complete destruction due to missile or drone attacks. As a result, the high-voltage grid cannot adequately meet the nation's power needs (UNDP et al., 2023).

Primary and subsidiary gas pipelines, compressor stations, gas distribution stations, and gas control stations in the Ukraine have endured damage. Alongside the ongoing war, restoration efforts have been made, including 15 of 27 kilometres of primary gas lines (UNDP et al., 2023). A considerable quantity of combined heat and power plants have been intentionally targeted, posing a threat to the provision of district heating services in the impacted cities, leaving around 30 percent of households without heating. The estimated damage to heating services totals at least USD 1.2 billion (UNDP et al., 2023).

At the start of 2022, the cumulative installed photovoltaic (PV) capacity was 7.6 GW. This figure excludes plants situated in regions temporarily occupied by Russia before February 24, 2022. Notably, this includes 45 thousand prosumer installations with a collective capacity of 1.2 GW. Presently, around 18 percent of Ukrainian PV capacities are under Russian occupation, and approximately six percent of the total installed solar capacity has suffered destruction or damage (International Energy Charter, 2022).

At present, the southern regions of Ukraine, characterized by the most significant wind energy potential, are under Russian control. This means approximately 80 percent of the wind generation capacities are in Russian occupied territories (International Energy Charter, 2022).

The Russian army has occupied Kakhovska HPP (343.2 MW), one of the ten hydro power plants in Ukraine. Two units of the plant incurred damage, with only three out of the six units currently operational, representing approximately 30-40 percent of the installed capacity of Kakhovska HPP (International Energy Charter, 2022).

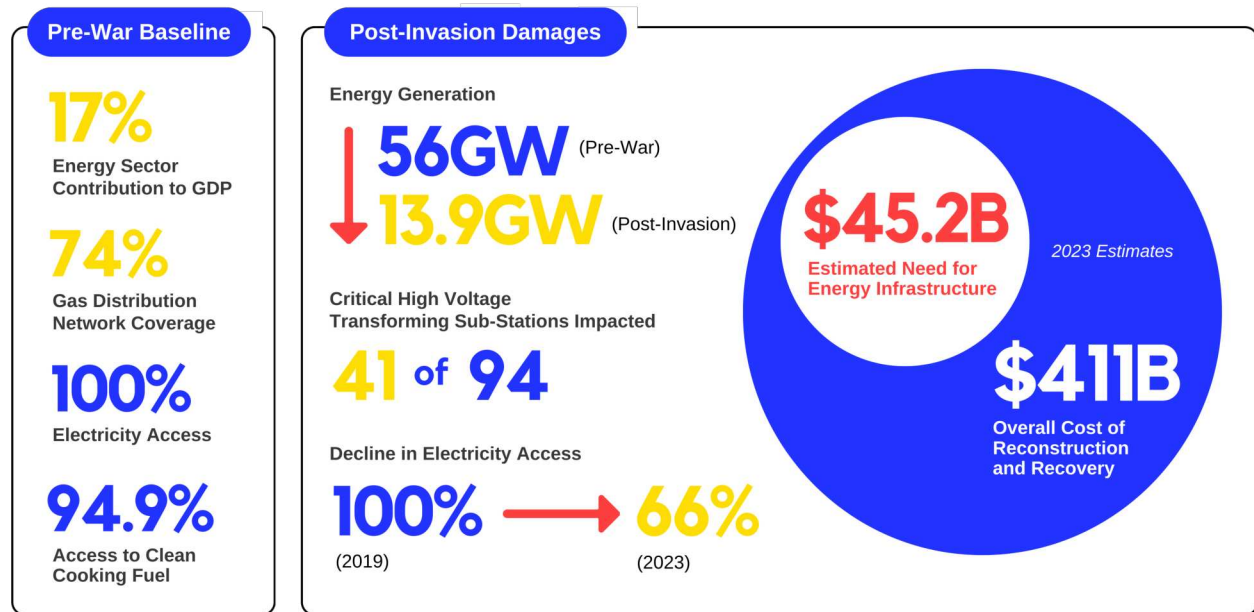
### **2.3. The capacity of renewables**

It is important to understand how electricity is produced from renewable energy sources (RES) in the context of this fund, since most renewable installations are dependent on favourable geographic locations that ensure

maximum generation. Before the war, most wind and solar energy in Ukraine was derived from its southern coast where wind and sun conditions are optimal. However solar potential is more distributed throughout the country. RES are not as dependable as fossil fuels to generate electricity, since their generation depends on external factors such as sunlight and wind. Ukraine stands out as having the greatest technical potential for RES compared to other nations in Southeast Europe, with potential capacity estimated at 874 GW. This includes substantial figures for solar (83 GW), onshore wind (438 GW), and offshore wind (250 GW) (International Energy Charter, 2022). The renewable energy sector in Ukraine has previously experienced rapid growth,

attributable to both its considerable RES potential and effective support mechanisms (International Energy Charter, 2022). Between 2009 and 2021, approximately USD 12 billion was invested in Ukraine's RES sector (International Energy Charter, 2022). Notably, the proportion of RES in the country's electricity production surged from 1.8 percent in 2018 to 8.2 percent by 2021. At the beginning of 2022, the cumulative installed capacity of RES, encompassing all grid-connected facilities, reached 9.5 GW, primarily from hydro power (International Energy Charter, 2022). It is important to note that these figures exclude generation originating in territories occupied by Russia before February 24, 2022.

Figure 2: Ukraine's energy landscape and investment need



Sources: IEA 2020, World Bank et al, 2023.

### 3. Ukraine's investment challenge & the need for derisking

Almost all Ukrainian companies are small and medium enterprises (SMEs). SMEs make up 99.97 percent of all businesses, include legal enterprises, but are mostly comprised of individual entrepreneurs, which account for 80 percent of all SMEs. Most of the working population are employed by SMEs, which are a major source of added value to the economy (OECD, 2022).

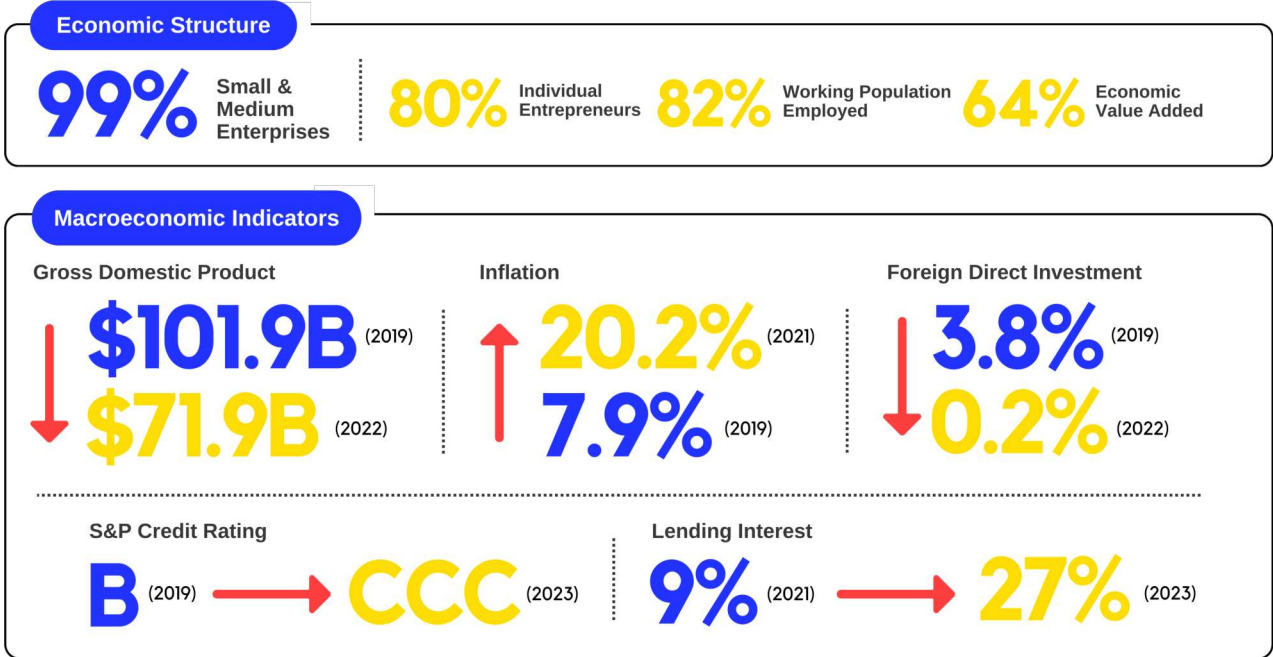
The importance of private entrepreneurship in Ukraine is clear, however the conditions for investment create hurdles. The economy contracted by a third compared to 2019 as a result of the war (The World Bank, 2022b).

In the same timeframe, foreign direct investment (FDI) decreased from 3.8 percent to 0.2 percent (The World Bank, 2022a).

This reflects the risk of newly installed assets being destroyed and the growing uncertainty of the economic environment. Consumers experienced this hardship through an increase of inflation from 7.9 percent in 2019 to 20.2 percent in 2022, effectively lowering purchasing power (The World Bank, 2022c).

The cost of capital has increased since the start of the war and is very high, with the National Bank of Ukraine reporting a lending interest rate of 27 percent in 2023 (National Bank of Ukraine, 2024). As a result, potential investors incur significantly more costs when taking out loans.

Figure 3: Ukraine's Investment Environment



Source: OECD 2022, World Bank 2022a, National Bank of Ukraine 2024.

### What is derisking?

Derisking is the process of attracting private sector investment to make projects financially viable, with the use of financial instruments.

On April 6, 2023, the rating agency S&P lowered Ukraine's foreign currency long-term sovereign credit rating to CCC. Investors had concerns about the Ukrainian government's debt reconstruction plan and feared that domestic needs would take priority over foreign investment repayment (Srinivasan, 2023). As a result, the investment environment is difficult for both Ukrainian businesses in need of capital and international investors. The sub-investment grade credit rating discourages FDI, while the high interest rates disadvantage local investment. Hence the need for derisking, since higher risk is associated with higher returns to generate a profit, which is not guaranteed in the current economic landscape.

Ukraine started the campaign "AdvantageUkraine" to encourage foreign investment. The website lists available investment projects from a variety of sectors, including the agro-industrial complex, pharmaceutical industry, power industry or innovation technology, which investors then can choose from. The Ukrainian government offers favourable conditions like easy access to

permits, exemption from corporate income tax for up to 10 years, compensation of up to 30 percent of capital expenditures and access to the Derzhava 1 la (DIIA) system (AdvantageUkraine, 2022). DIIA is a digital platform of public services where ID, passport, business registrations or social security payments can be applied for and accessed online (Steuer, 2023). While AdvantageUkraine does not solve the problem of insufficient private investment, it is a starting point for matchmaking between investors and project proposals.

### 3.1. Who is currently funding Ukraine's recovery?

An assessment on several post-invasion international funds operating in Ukraine is presented in Table 1 below. These funds, as detailed, break down the types of support rendered and the extent to which such support aligns with the mandate of the contributing institutions. This analysis also catalogues which existing funds include a green component.

Some funds, like the EBRD Resilience and Livelihoods Package and the Ukraine Energy Support Fund incorporate green financing, but the latter only allocates a mere three percent towards the renewable sector. The predominant theme from the analysed funds is short-term focus. Other funds like the Ukraine Economic Resilience Action (ERA) and the Support to Ukraine's Reconstruction, and the Economy Trust Fund (SURE TF) address



infrastructure but lack a strong vision for a greener future. All of the analysed funds focus on immediate action. Some funds, such as the SURE TF, ERA and European Union for Ukraine

Fund (EU4U) use guarantees and political risk insurance to add a component of project security.

**Table 1: Active funds supporting a post-invasion Ukraine**

Fund Name	Fund Manager	Guarantor	Mandate	Financial Assistance	Green Component
EBRD Resilience and Livelihoods Package	EBRD	EBRD	Energy Security, Trade Finance, Provision of Liquidity SMEs	Payment Deferrals, Debt Forbearance and Restructuring	Yes, Green Economy Financing is included.
Ukraine Energy Support Fund	Energy Community	Energy Community	Financing Urgent Energy Infrastructure Need	Grant Agreement	Yes, the fund also targets renewable energy sector (3% based on June 2023 Report) .
Support to Ukraine's Reconstruction and Economy Trust Fund (SURE TF)	World Bank	MIGA	Mobilize Private Capital for Economic Activity and Critical Infrastructure Rebuilding	Grants, Concessional Loans, Political Risk Insurance	Yes, the fund assists sustainable infrastructure, but it is not the primary sector.
Ukraine Economic Resilience Action (ERA)	World Bank	IFC	Sustainable Economy and Secure Supply Chain	Loans, Equity, Risk Sharing Facility	Yes, the fund assists sustainable infrastructure, but it is not the primary sector .
European Union for Ukraine Fund (EU4U)	EIB	EIB	Infrastructure Reconstruction and Access to Finance	Grants, Concessional Loans, Equity, Guarantees	No, green component is not explicitly stated.

Source: Energy Community (2023); European Bank for Reconstruction and Development (2022); European Investment Bank (n.d.); International Finance Corporation (n.d.); Multilateral Investment Guarantee Agency (n.d.).

The analysed funds all focus on immediate recovery and stabilisation. However, they allocate an inadequate share of resources to green electricity infrastructure. Therefore, opportunities arise from the gaps left by these funds. One such gap is a long-term environmental and economic strategy. A new fund could seize the chance to fill this gap, focusing on the long-term transformation and greening of Ukraine's energy landscape. This strategy would not only complement the

immediate actions of existing funds but also align with the global green transition.

## 4. What can we learn from funds in comparable environments?

### 4.1. Multi-donor infrastructure funds & post-conflict reconstruction funds

To draw on best practice for fund design we analyse seven case studies which operate in comparable environments or share defining characteristics to the Ukrainian context. The

ASEAN Infrastructure Fund (AIF) and Program for Infrastructure Development in Africa (PIDA), provide models for pooling regional finances for green infrastructure projects in suboptimal investment conditions. Four funds are designed to rebuild post- or alongside conflict with a long-term focus: the International Reconstruction Fund Facility in Iraq (IRFFI), the Marshall Plan, Bosnia and Herzegovina's Priority Reconstruction Program (PRP), and the Syrian Recovery Trust Fund (SRTF). Additionally, we analyse the Juncker plan, which operated through an economic crisis. Disaster relief funds were not analysed because these exclusively used grants rather than focusing on investment.

For each fund, we identify the mandate and the operating model; the characteristics of the fund's structure which ensure its functioning. An assessment of these characteristics builds a picture of what instruments are often employed by funds, dependent on context, purpose, and design choice. Our goal is to draw lessons from each fund design and use these lessons to help design a new fund. To do this, we determine if the operating model progressed or hindered its mandate. Table 2 provides a summary of the selected funds, relevant aspects of each operating model, and mandate or contextual features applicable in Ukraine.

**Table 2: Analysed funds and their applicability to the Ukraine context**

Fund	Operating Model	Relevant & Mandate Elements Shared with the Ukraine Context
ASEAN Infrastructure Fund (AIF) - Asia, 2011 -	Asian Development Bank (ADB) is fund administrator, co-financier, and fund shareholder	Focus on green infrastructure, multi-donor regional investment
International Reconstruction Fund Facility in Iraq (IRFFI), 2004 – 2010	Two-window structure: expertise of the World Bank and the UN facilitated activities	Reconstruction during ongoing conflict, multi-donor, donor engagement, technical assistance
Juncker Plan – Europe, 2015 – 2020	European Fund for Strategic Investments (EFSI), a financial guarantee from the EU to the EIB. Advisory hub for technical assistance, and online portal for matching investors and projects	Attracting investment to higher risk projects
The Marshall Plan – Europe, 1948 - 1951	Utilises technical and policy assistance. The US shipped goods for immediate needs, paid for by EU countries into a fund which propelled infrastructure and business rebuild	External party funding and co-implementing reconstruction plans post-conflict, to facilitate trade, industrial modernisation and infrastructure development
Priority Reconstruction Program (PRP) - Bosnia and Herzegovina, 1995 – 1999	A mixture of grants and 'seed capital' from World Bank. Funds held by Bank Trust Fund for BiH (TFBH)	Multi-donor reconstruction post-conflict, reduce dependence on foreign aid, domestic production and employment
Program for Infrastructure Development in Africa (PIDA), 2012 –	Coordinates and implements the African Union Development Agency; utilized public funding, PPPs, debt financing (i.e. African Development Bank loans)	Focus on green infrastructure, multi-donor regional investment
Syrian Recovery Trust Fund (SRTF), 2013 –	KfW as trustee, on behalf of the German Foreign Office and the United Arab Emirates	Reconstruction during ongoing conflict, multi-donor, donor engagement, technical assistance

Source: Asian Development Bank (2019); Gairdner et al. (2009), European Commission (2018); Congressional Research Service (2018); World Bank Group & EBRD (1997); African Development Bank (2019); KfW, (n.d.).

## 4.2. Operating models

The assessed funds vary in operating model, characteristics of which are outlined in Table 3.

The characteristics fall into two categories: structural design choices and financial instruments. Although several other financial instruments are available, we narrow the analysis to those widely used in post-conflict or infrastructure focused contexts. There are other design characteristics not included in the

analysis, for example, funds sometimes explicitly include a team dedicated to influencing policy and advocating for structural reform in the target country. However, this is omitted, since we believe legislation should remain a responsibility of the target country and not be dictated by outside entities.

Measures against corruption were absent from the operating models of the assessed funds, as this lies outside the capacity of a fund.

Table 3: Operating model characteristics in analysed funds

Fund Name	Public Funding	Private Investment	Same Manager & Guarantor	Project Filter	Multi-Level Governance	Grants	Concessional Loans	Equity Debt	VGf	PRI
AIF	✓		✓	✓		✓	✓		✓	✓
IRFFI	✓		✓	✓	✓	✓	✓			
Juncker Plan	✓	✓		✓	✓			✓	✓	
PRP	✓			✓		✓				
PIDA	✓	✓	✓	✓	✓	✓		✓		✓
Marshall Plan	✓	✓		✓		✓				
SRTF	✓			✓	✓	✓				

Source: European Commission (2018); Asian Development Bank (2022); Gaidner et al. (2009); Congressional Research Service (2018); World Bank Group & EBRD (1997); Sofreco (2011); Syrian Recovery Trust Fund (2014). VGf stands for Viability Gap Funding, and PRI stands for Political Risk Insurance, financial tools which are defined and expanded on below.

### 4.3. Lessons learned

#### Public & private investment

All the assessed funds are based on public investment, with three incorporating private partnerships. This is a feature of multi-donor funds where public money can leverage private investment through viability gap funding and other instruments, which are explored below. The Juncker plan favours public private partnerships, including an online project matching platform for ventures. The public funding bolsters private investment on financially high-risk projects and boosts innovation through an economic crisis. Similarly, PIDA combines private and public investment through various means, as regional pooling of money is insufficient to meet the fund's goals long term (Sofreco, 2011). Senior civil servants and industry representatives worked together to coordinate the Marshall Plan's implementation, indicating the prominence of private public partnerships (Eichengreen, 2010). The Marshall plan's investment into infrastructure and industry boosted production and trade, both within Europe and bilaterally with the United States. A key lesson drawn is that public and private investment can give the fund and its impacts longevity and advance its mandate, something important in the Ukrainian context.

#### Same manager and guarantor

In three of the seven cases, the same entity took on dual roles of fund manager and

guarantor. The fund manager is responsible for carrying out the fund's mandate through its operating model. The guarantor is an entity that supports investment projects by bearing financial compensation in circumstances where projects fail. This assurance plays a pivotal role in building private sector confidence. Having the same entity as both fund manager and guarantor has the advantage of cutting down on administration costs, ensuring a common understanding of mission and purpose, and streamlining project implementation. However, there are fewer checks and balances and therefore increased risk of mismanagement, which comes with having more resources concentrated in one entity.

Partnering with a development bank can make the fund more effective and efficient in delivering on its mandate. For example, the Asian Development Bank (ADB) plans, designs and carries out project tasks for the AIF. This takes the administrative and organisational burden off the AIF, ensuring maximum finance is directed to the projects themselves. PIDA takes a different path, entrusting the African Union Development Agency with organisation and implementation, while maintaining relationships with various financial institutions like the African Development Bank (AfDB). In contrast, the IRFFI had a unique 'two window' structure, where the existing administration and expertise of the World Bank and the United Nations facilitated activities, and both entities shared the roles of manager and guarantor

(Gairdner et al., 2009). Based on these experiences, we consider a development bank partner important, which could also take on the dual role of guarantor and fund manager.

### **Project filtering and prioritisation & multi-level governance**

The Juncker plan focuses on strategic investments. It prioritises projects and pursues common initiatives, pools infrastructure needs, and advances social wellbeing by providing financial support to encourage investment to higher risk projects (Botopoulos, 2019). One major project under the European Fund for Strategic Investments, a pillar of the Juncker Plan, was a EUR 250 million wind farm project (European Investment Bank (EIB), 2018).

Donors to the PRP recognised that it was not possible or desirable to rebuild the economy to what it was pre-war, given that much of the economic structure was then outdated (Ciagne et al., 1999). EU accession was also a theme in the rebuilding partnership. Bosnia and Herzegovina aligned projects with these goals. For example, the government requested a line of credit for SMEs, sought to proceed with social security, and reconstructed the power grid to rejoin with Western Europe (International Development Association (IDA), 2010). A key lesson from the PRP case is to allocate funds towards transformative projects, to integrate with EU energy systems and trading.

The Syrian Recovery Trust Fund (SRTF) assists occupied territories to rebuild essential services (SRTF, 2014). Specific parameters filter and prioritise projects. Although the SRTF is a small-scale fund, it demonstrates a working governance structure for operating in ongoing conflict, which could be scaled up. To ensure integrity and project relevance, multiple levels of governance cooperate to use resources optimally, which is the key lesson from this fund. Multi-level governance is the inclusion of various bodies that work to filter projects, provide advice, steering and auditing. In some cases, multi-level governance is convoluted and does not service the fund's mandate, for example in the case of IRFFI, where roles were not clearly defined. However, multi-level governance can increase internal transparency, allowing scrutinisation and ensuring the mandate of a fund is realised. SRTF also includes an external auditor, which adds a level of oversight that is crucial to the integrity and transparency of the fund.

### **Financial instruments: grants, concessional loans, and equity debt**

From seven funds analysed, six include grants as part of their instruments. Grants are an essential element of post-conflict funds and funds aimed at a simultaneous rebuild with conflict. This instrument is often associated with development programmes. For instance, IRFFI used USD 400 million in grants to train civil servants in project management, building



up the bureaucratic capacity required for a physical rebuild (The World Bank, 2015).

In addition to grants, concessional loans have a more generous repayment structure than standard loans. The ASEAN Catalytic Green Finance Facility (ACGF), which sits under the AIF, includes concessional loans for projects which meet the fund's criteria (ADB, 2019). The IRFFI also used concessional loans to "finance development projects in priority sectors", thus enabling the implementation of its mandate (The World Bank, 2015).

Equity debt is another instrument that has arisen through this analysis. The Juncker Plan used equity debt as a tool to support higher risk projects, for example for smaller companies with no credit history (European Commission, 2018). Using equity debt progressed the Juncker Plan's mandate, leading to industry innovation and financial recovery. PIDA is another example of how funds can utilise equity financing effectively. By combining equity with concessional loans, the Ruzizi III Project, a 145 MW hydro project costing USD 450 million, was successfully built (Sofreco, 2011).

Grants, concessional loans, and equity are suitable instruments for financing green infrastructure projects in Ukraine. This conclusion is supported not only by the evidence from previously discussed examples but also by considering the context in Ukraine, where the straightforward nature and familiarity of these financial instruments offer an advantage.

## **Financial derisking: viability gap funding and political risk insurance**

AIF and PIDA, which focus on energy infrastructure as their priority mandates, use similar financial derisking instruments. The ADB, as the fund manager for AIF, provides Viability Gap Funding (VGF) and Political Risk Insurance (PRI), which has now become part of their product offering (ADB, 2019). Although VGF is new in the investment world, the funding is beneficial in filling the Internal Rate of Return (IRR) gap from a project, thus increasing investor confidence. For PRI, this insurance helps to reduce the risk of damage to project assets or interrupted business processes. Fund managers of PIDA also recognise the high political risks that may hamper green infrastructure projects (AUDA-NEPAD, 2023).

The financial risk can be mitigated with instruments such as VGF and PRI. In Ukraine, the shortfall in profitability or war damage poses a significant risk, deterring the private sector from entering the investment market. Thus, VGF and PRI needs to be considered in developing a fund for Ukraine.

## **5. Green Horizon Fund for Ukraine (GHF4U)**

The Green Horizon Fund for Ukraine (GHF4U) is a multi-donor fund which pools resources from public entities to derisk private sector investment. This fund's design is based on the lessons learned outlined above to fill the

identified gap in Ukraine's recovery. The following lays out the GHF4U's organisational structure and operating model, tailored to Ukraine's energy sector needs.

## 5.1. Mandate

The primary mandate of GHF4U is to mitigate investment risks for private actors by leveraging public funds for the development of green electricity infrastructure projects in Ukraine. The green component acknowledges climate change and ensures future compatibility with the EU market.

Transformative features are essential for local buy-in. Without Ukrainian public support, projects face implementation challenges and risk failure. The mandate, more specifically, is two-fold:

1. promote projects that drive green innovation and technology adoption
2. foster transformative change with a lasting impact on the socio-economic conditions in Ukraine

The reconstruction of Ukraine should contribute to Ukraine's green transition. This war coincides with a global energy transition, and Ukraine cannot afford to fall behind. Ukraine's potential to produce and export green energy should be realised to not only keep pace, but to lead the way. Ukraine would find itself in demand as a green energy supplier, particularly to the EU. While Ukraine previously earned rents from gas thoroughfare, it would now profit from being both the

producer and supplier. This would represent a major new revenue stream for the government and a significant boost to the economy.

Potential green energy exports include green biomass, green hydrogen, or green electricity via the electrical grid (Fraley, 2022; Golz et al., 2023; Morningstar et al., 2023).

Transformative change with lasting improvement on Ukraine's socio-economic conditions is not just idealism. Public support is essential for the longevity of projects causing major transformation to existing infrastructure. Local buy-in enhances when socio-economic improvements coincide with new technology systems.

## 5.2. Focus on electricity infrastructure

GHF4U strategically targets the development of electricity infrastructure. This includes crucial components such as grid construction, restoration, and technological advancements in generation, transmission, storage, and heating systems. This decision recognises the urgent need for reconstruction in the energy sector (see Chapter 2). Electricity infrastructure underpins every aspect of society, making it fundamental to reconstruction and therefore a priority sector for investment. It is also one of the most affected sectors by the war. Since the electrification of energy and industrial systems is key to a green transition, prioritising electricity infrastructure gives Ukraine an excellent green foundation to build upon.

### 5.3. Eligibility criteria

#### What is the EU Green Taxonomy?

The Taxonomy is a classification system that defines criteria for economic activities that are aligned with a net zero trajectory by 2050.

##### Six main components:

- Climate change mitigation
- Climate change adaptation
- Sustainable use and protection of water and marine resources
- Transition to a circular economy
- Pollution prevention and control
- Protection and restoration of biodiversity and ecosystems

In line with its mandate, the GHF4U's eligibility criteria prioritise projects that are both green and transformative.

#### 5.3.1. Greening

The GHF4U uses the EU Green Taxonomy (Regulation (EU) 2020/852) to define what makes projects "green". Many funds struggle finding potential projects, in part due to differing and complex criteria specific to the fund. Using an external standardised taxonomy

provides legitimacy and reduces friction in understanding the green eligibility criteria.

The EU Green Taxonomy is the best external standardised taxonomy for Ukraine. This is especially true given that Ukraine's EU membership process is already underway (Directorate-General for Communication, 2023; European Commission, 2022, 2023). Aligning Ukraine to the EU Green Taxonomy could also make it more attractive for trade and investment (Garcia Mora et al., 2023). Importantly, using this standard for the green eligibility criteria makes the GHF4U responsive to regulation changes and Ukraine's integration with the EU. This saves GHF4U from having to continuously revise its green eligibility standards.

#### 5.3.2. Transformative change

#### What is "transformative"?

In this report, transformative change means transforming the Ukrainian electricity infrastructure with the overall aim of enhancing socio-economic conditions in Ukraine. The specific indicators considered are employment and income level.

Two key indicators of socio-economic status are employment and income level, which is why the GHF4U screens projects for their impact on these two factors (IRENA, 2022).

Employment and income level are associated with the livelihood of people. The development of infrastructure projects creates green jobs and helps to raise the income of the community (Jaeger, 2021). This increases project acceptability and community ownership of the project because the improvement of livelihood is interlinked with its success.

## 6. Analytical basis & limitations

Rebuilding Ukraine is a complex task. GHF4U's contribution is limited and does not exist in a vacuum. Therefore, we recognise and establish our limitations and analytical basis both in terms of the scope of the fund and its design. One such limitation is that the GHF4U's design does not cover implementation, leaving this to the Board of Directors, who are equipped to put the GHF4U into practice. The role of the Board of Directors will be expanded upon in Chapter 7.

### 6.1. Investment cannot wait for peace

Two years into the war, there is no end in sight. While predictions cannot be made about the timing and outcome of the war, rebuilding Ukraine cannot wait for peace. While war continues, Ukrainians must live their lives. Additionally, concentrating money only on quick war-relevant fixes could lead to undesirable path-dependencies for Ukraine's mid- and long-term future. While construction in wartime risks being targeted and destroyed by Russia, it should not deter the attempt. The

truth is: even if peace materialised tomorrow, many of the present risks and uncertainties facing investment in Ukraine would remain. As investment cannot wait for peace, the derisking facilitated by GHF4U is without alternative, even during times of war.

### 6.2. Beyond keeping the lights on

Most funding measures are focused on immediate, drop-in "repair or replace" solutions. This is justifiable and valid against the imperative of keeping Ukraine running while it fights the war. However, the purpose of the GHF4U is different: facilitate investment in Ukraine's mid- to long-term future. Because of its mission to future-proof reconstruction in Ukraine, funding urgent fixes is left to other vehicles and organisations. The previous analysis showed a lack of funds targeting the long-term transformation and greening of Ukraine's energy landscape, a goal that GHF4U strives to accomplish.

A focus on immediate "replace or repair" solutions characterises Ukraine's rebuild as returning to the pre-war state. However, we believe that Ukraine and its future will be better served by "building forward". This means bringing Ukraine's infrastructure from Soviet era to the green cutting edge of the future.

Additionally, there are instances where upgrading would be more immediately beneficial rather than "replacing or repairing". This is particularly the case with Ukraine's bespoke electrical infrastructure. Sourcing

replacement parts from a hostile Russia is unlikely and components from the rest of the world are unable to be dropped in. Creating capabilities to produce inside Ukraine requires extra resources and will result in a single supply line vulnerable to Russian attack. Upgrading the infrastructure to EU standardisation would not only open supply for repairs but bring Ukraine closer to the EU and streamline future energy developments in production and trade. A win-win for both current and future Ukraine, beyond keeping the lights on.

### **6.3. Corruption and governance**

Corruption is a persisting challenge in Ukraine, both from a societal point of view and when it comes to the investment environment. Yet, a fund focused on derisking private investment is not well placed to fight corruption, which arises mainly – though not exclusively – at the procurement level. As discussed above, the GHF4U does not address project implementation. More fundamentally, overburdening the fund with an agenda it lacks the tools or jurisdiction to act upon, would harm success. Similarly, analysing or

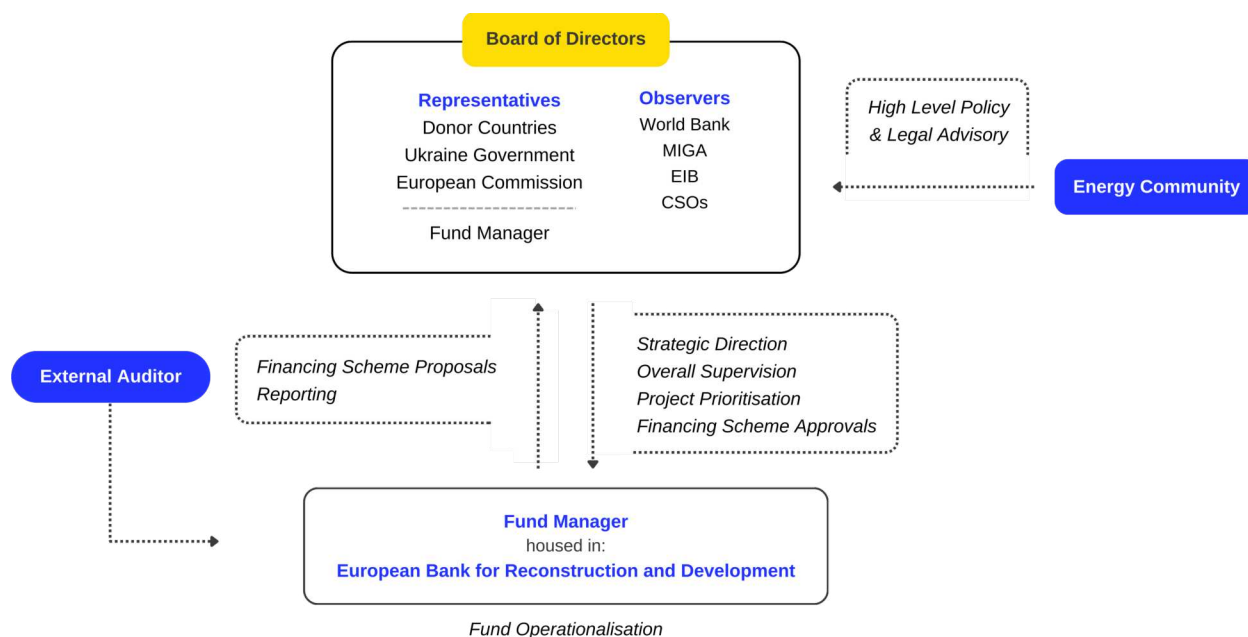
advocating for policy change lies outside the scope of this report and of the fund outlined in it. Additionally, lobbying branches are not included in the GHF4U design. Topics of Ukrainian regulation or governance are therefore not considered. The GHF4U's operational structure implements lessons learnt from Chapter 4 to establish it as a beacon of transparency, setting standards for good governance related to public finance. However, beyond setting an example, the GHF4U only addresses its own internal transparency and governance. Similarly, while the GHF4U's transformative impact is hoped to change and indeed improve policy environments in Ukraine, this would only be in an indirect manner.

## **7. Organisational structure**

The GHF4U's organisational structure comprises of a board of directors, fund manager, external auditors and a policy and legal advisory to the board. The structure involves several public entities to enhance investor confidence.



Figure 4: Green Horizon Fund for Ukraine: Organisational structure



## 7.1. Board of Directors

The Board of Directors (BoD) comprises of representatives from the donor countries, the Ukrainian Government, and the European Commission, who hold voting rights on fund affairs. The representation of the Ukrainian Government and the European Commission increases their ownership of GHF4U. The BoD also establishes a line of communication between all responsible parties, thereby avoiding information asymmetries. In addition, a fund manager representative serves as an envoy to the board, presenting financing scheme proposals and regular reports. Based on agendas proposed by the fund manager, the BoD provides strategic direction to the fund manager and performs overall supervision on a periodic basis. Based on available projects in the project bank (see Chapter 8.5), the BoD takes responsibility to prioritise projects based

on Ukraine’s strategic needs, taking into account the fund’s mandate. Furthermore, the BoD comprises of observers from World Bank, MIGA and EIB. The observers hold prior experience and expertise of working in Ukraine and are actively supporting Ukraine in the infrastructure sector. Moreover, representatives of Ukraine-based Civil Society Organisations (CSOs) are also granted observer status. This ensures transparency and accountability, links the fund back to non-governmental actors, and creates opportunities for potential partnerships between the fund manager and the observers on project-to-project basis. However, the observers hold no voting or any other decision-making rights regarding the GHF4U.

## **7.2. Policy & legal advisory: Energy Community**

The Energy Community Secretariat (EC) provides high level policy and legal advisory to the BoD. Due to their long-standing expertise in the EU's Eastern Neighbourhood, its close work relations with the European Commission and its in-depth ties with key Ukrainian policy actors and lawmakers, the EC is ideally placed to support and advise the BoD during decision making processes. The BoD decides on pertinent funding proposals after hearing the legal appraisal from the Energy Community. The EC also leverages its strategic position and significant expertise to advocate for and facilitate Ukrainian policy frameworks conducive to private sector investment. As neither fund manager nor the EC have any role in policy implementation, this will avoid possible of conflicts of interest.

## **7.3. Fund manager & guarantor: European Bank for Reconstruction and Development**

The European Bank for Reconstruction and Development (EBRD) acts as the fund manager for GHF4U. The EBRD has a proven track record and ample resources to manage large funds. It is also especially capable in derisking private sector investment through financial and technical assistance, thus developing bankable projects, notably in Eastern Europe and the former Soviet Union, where the organisation has a historically strong presence.

Importantly, the EBRD has a firm presence in Ukraine where it is the largest institutional investor with 529 projects as of December 2022 (European Bank for Reconstruction and Development (EBRD), 2023). These experiences play a critical role to operate GHF4U. The EBRD understands private sector interests and can tailor its services accordingly. The EBRD has inhouse legal expertise to handle any arising issues within the fund operation. The physical location of GHF4U is to be determined by the EBRD.

Additionally, the EBRD acts as a guarantor for investment projects. The guarantor is an entity that supports investment projects by bearing financial compensation in circumstances where projects fail. This assurance plays a pivotal role to build private sector confidence in Ukraine. The EBRD also explores partnerships with prominent project multilateral and bi-lateral project guarantee agencies such as the MIGA, the EIB, or the World Bank.

## **7.4. External Auditor**

The GHF4U's organisational structure includes an external auditor which conducts independent and timely audits to ensure transparency and accountability. The selection of the external auditor is undertaken by the BoD upon the fund manager's recommendation. The role of external auditor can be fulfilled by pertinent companies such as KPMG, EY, Deloitte, or PwC. The involvement of an established and independent auditing firm increases the credibility of the GHF4U.

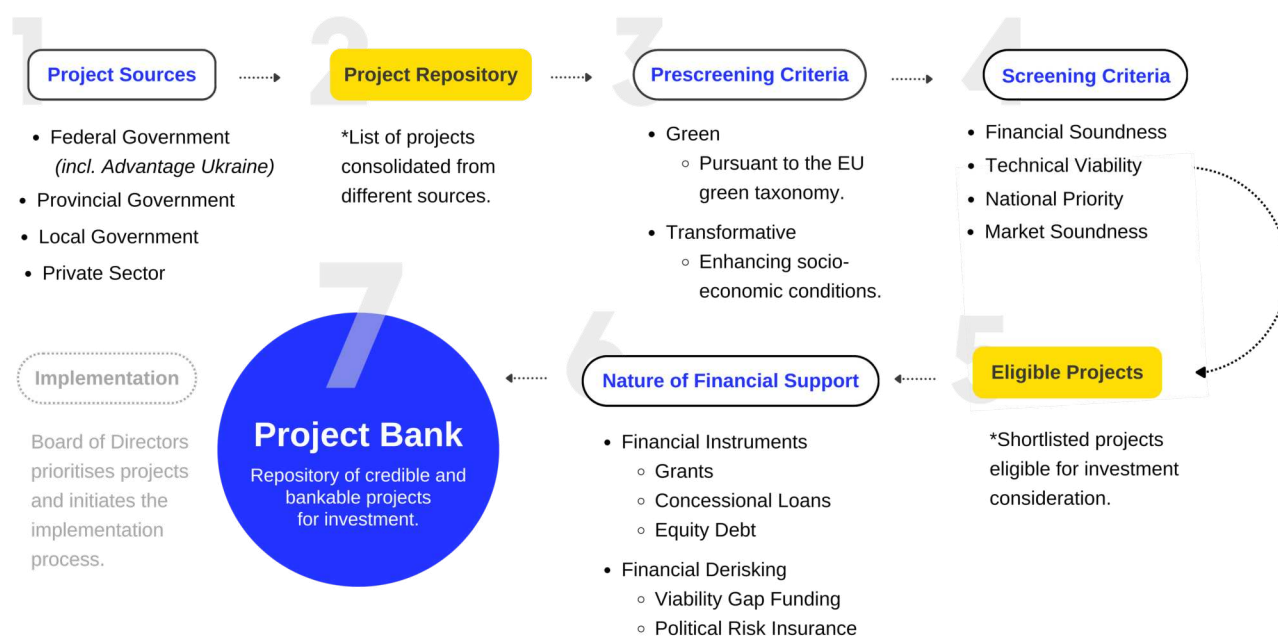
## 8. Operating model

The operating model of the GHF4U focuses on the bankability of the projects by providing financial assistance to derisk and attract private sector engagement. An effective way to attract private sector resources in infrastructure investment is by developing a project pipeline. The main objective behind the project pipeline is to identify, screen, and streamline potential electricity infrastructure projects. This occurs

through a systematic, transparent, and robust framework, eventually generating a project bank available for private investment.

The project bank highlights a set of streamlined potential infrastructure projects. These show the scope and scale of investment opportunities. They also communicate prospects and available tools to the private sector. Figure 5 depicts the GHF4U's seven-step project pipeline, aimed at creating repository of bankable projects.

Figure 5: Green Horizon Fund for Ukraine: Operating model



### 8.1. Project identification

Developing the project pipeline involves identifying green electricity infrastructure projects that cater to the GHF4U's mandate. The sources of potential investment projects remain diverse and multi-level. Potential

projects are collected by the fund manager from the private sector, federal line agencies (including AdvantageUkraine), provincial and local government, and any other existing project inventory with the Ukrainian government. This results in a long list of projects.

## 8.2. Project screening and selection

The long list is run through pre-screening and screening processes. The pre-screening ensures a given project fulfils the green and transformative eligibility criteria (see Chapter 5.3). Projects are then vetted against standardised screening criteria to become eligible projects. Four key criteria have been identified for project screening:

- **Financial soundness:** The fund manager conducts an assessment of the project's financial soundness to determine its attractiveness from a financial perspective (rate of return). Through financial assessment, the fund manager will also identify the need of any incentive and type of financial support required to make the project viable.
- **Technical viability assessment (TVA):** The TVA evaluates the technical resources and soundness of technical components or technology proposed in the project. This is carried out by the fund manager. Given Ukraine's current circumstances, proven and existing green technology accepted and widely used internationally will be prioritised over nascent technology.
- **National interest and no project duplication:** The identified projects should align with Ukraine's national/sectoral priorities, as outlined in the National Energy and Climate Plan. The fund manager ensures that there is no duplication,

overlapping or contradiction with other non-GHF4U projects. Similarly, the fund manager ensures that projects received from line ministries of the Ukrainian government are not already in the implementation phase or overlap with each other.

- **Market sounding:** The market sounding of an identified project primarily comprises of two aspects: existing investor analysis, and an assessment of project affordability and willingness. Existing investor analysis is a screening of the current landscape of investors in the market to identify their preferences, and their pattern of engagement with similar projects in the past. Assessment of project affordability and willingness is the scrutiny of both the supply (investors) and demand (end users) sides. While the fund manager gauges the interest of potential new investors in the project, it also ensures that end-users can afford and are willing to pay for the services provided by the project. The fund manager applies these screening criteria subject to the guidelines prepared by the BoD. The weighting of each criterion is determined by these BoD guidelines.

## 8.3. Eligible projects

The shortlisted projects become eligible for investment consideration. While these eligible projects are essential for long-term socioeconomic and environmental advancement, they may not initially possess

bankability due to a lower short-term return rate. These projects are then supported accordingly to ensure bankability through specific financial assistance.

## 8.4. Financial assistance

The selected projects receive financial assistance to become bankable. Appropriate financial instruments and derisking measures collectively enhance the project's appeal to investors by ensuring a favourable balance between risk and reward.

### What financial instruments are relevant?

**Grants:** Non-repayable funds that aim to provide initial capital and help in creating new investment markets, often accompanied by supportive assistance or development programs.

**Concessional Loans:** Loans with more favourable terms than standard market options, specifically through lower interest rates and extended repayment periods.

**Equity Debt:** Funding facility through the sale of shares. Can reduce the pressure of paying interest on the loan. The equity shareholders have the ability to transfer technological knowledge to other projects.

### 8.4.1. Financial instruments

The EBRD, as the GHF4U fund manager, has historically supported Ukraine and is capable of tailoring a strategic selection of financial instruments based on the needs of the project. Several financial instruments will be included in GHF4U, drawing on lessons learned from other funds (refer to Chapter 4.3), which include grants, concessional loans, and equity debt.

#### Grants

Green electricity projects require substantial upfront capital for infrastructure development. However, beyond the construction phase, grants can play a crucial role in micro-scale projects. The EBRD can also ensure the effectiveness of grants in supporting Ukrainian vital sectors (EBRD, n.d).

#### Concessional loans

Concessional loans are needed to maintain financing access during Ukraine's ongoing invasion. This is especially relevant with the high upfront cost characteristic of electricity infrastructure projects, such as power grids. Concessional loans also account for 12 percent of global energy infrastructure investment (Buchner et al., 2021), thus including this instrument in GH4FU is necessary.

#### Equity debt

Equity debt can serve as an alternative financing option for projects that need cash flow maintenance. One example of equity

financing in Ukraine is the Porogi solar energy sub-project, which was financed through equity from Eco-Optima and debt from the EBRD (European Bank for Reconstruction and Development (EBRD), n.d.). Given this possibility and the EBRD's experience, equity financing should be incorporated into GHF4U.

### 8.4.2. Financial derisking

Green electricity projects need a combination of grants, loans, and equity in the financing scheme. However, these financial instruments alone are insufficient to stimulate private sector investment, particularly considering the ongoing war in Ukraine. To derisk the potential shortfall in profitability or damage caused by war, VGF and PRI will be used in GHF4U, as outlined by lessons learned from other funds (see Chapter 4.3).

#### Viability gap funding

VGF is established to cover a potential shortfall in profitability, especially for economically justified projects with high expected IRR. For instance, for renewable energy infrastructure projects in Ukraine, the potential IRR is approximately 15 to 20 percent (United Nations

Development Programme (UNDP), 2022; Wind Solar Energy LLC (WSE), 2022). As depicted in Figure 6, the usage of VGF covers the difference between the expected and actual IRR.

#### What derisking instruments can be used?

##### Internal Rate of Return (IRR):

Amount of expected earnings each year over the project's lifetime. This is based on the project's cash flow.

##### Political Risk Insurance (PRI):

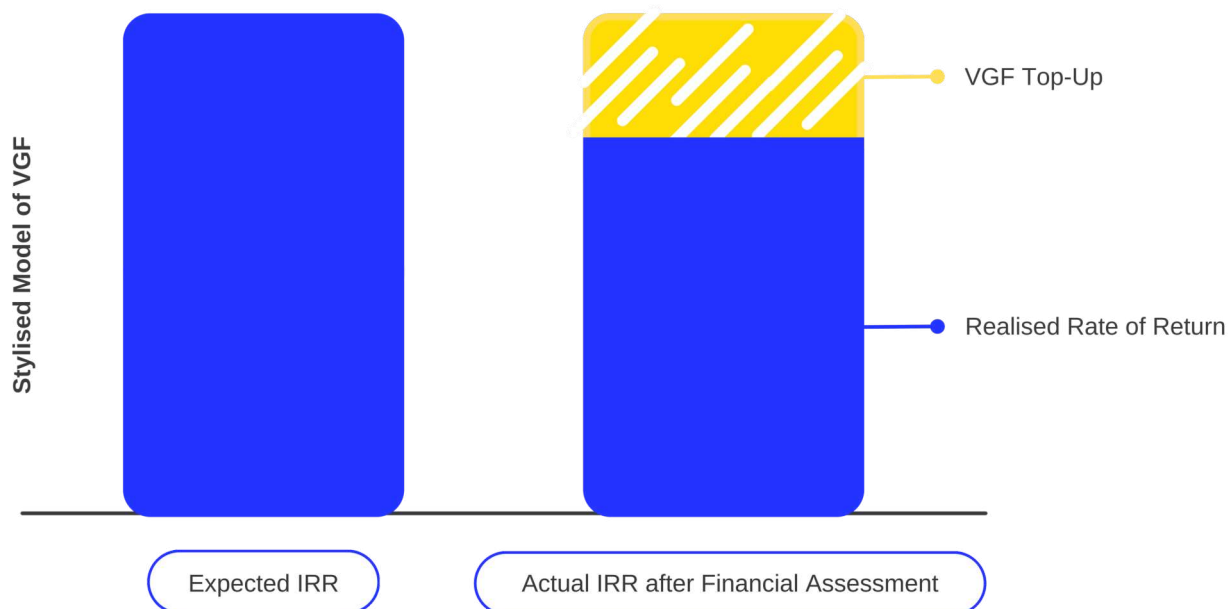
Insurance that protects investors and lenders from various non-commercial risks, including war damage. A product offered by Multilateral Investment Guarantee Agency (MIGA), part of the World Bank Group.

##### Viability Gap Funding (VGF):

Amount of funding required to address shortfall in IRR. This can increase project bankability and improve investor confidence.



Figure 6: Demonstration of viability gap funding



### Political Risk Insurance (PRI)

PRI can cover losses ranging from damage to complete destruction of assets, an incident that has occurred in Ukraine. As discussed in Chapter 2.4, much of Ukraine's energy infrastructure has been destroyed by missile or drone attacks. Therefore, the role of PRI in protecting projects from these kinds of risks is important in achieving the goals of GHF4U.

### 8.5. Project bank

The project bank is a repository of credible and bankable projects for investments. The eligible projects are included in the project bank after financial assistance has been identified. The projects in the project bank insulate the private sector from various investment risks to foster a conducive investment environment. The BoD priorities projects, which are then released for implementation, thus completing the operational model.

## 9. The path toward a green, transformative rebuild of Ukraine

The time to step on the path toward a green and transformative rebuild of Ukraine is now. A successful rebuild will be a continuous process but requires laying solid foundations. The shape of these foundations will dictate Ukraine's future, meaning there is also massive opportunity for positive change. To achieve sustainable impact, funds need to aim high and consider structural change which will benefit Ukraine not just in the next five, but rather the next 50 years. Public money is key to bring transformative change through private sector investment. The Green Horizon Fund for Ukraine sets the country up for a green and prosperous future. Rather than building back, build forward!

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