

Delivering sustainable infrastructure for Ukraine's post-war reconstruction and recovery

Policy paper

Author:

Tautiyeva Lyudmyla MPP (lt535@cantab.ac.uk)

Intellectual Forum, Jesus College, University of Cambridge



Table of Contents

Summary	3
Introduction: What is sustainable infrastructure (SI)?	7
1. Why SI for Ukraine?	7
2. Delivering SI: strategic vision and policy governance	11
2.1. Developments in the area of reconstruction policy that affect SI delivery	12
2.2. Developments in the area of regional development policy affecting SI delivery	18
2.3. Developments in spatial planning affecting SI delivery	21
2.4. Capabilities of local governments and SI delivery	23
3. Implementation of SI: sustainable construction practices	25
3.1. Setting the construction sector on sustainability-focused development path	27
3.2. Building Information Modelling (BIM) systems for SI	28
4. Implementation of SI: engaging local communities in infrastructure decisions	29
4.1. Engaging citizens in decisions on infrastructure for recovery at the local level.....	30
4.2. Engaging communities into decisions on design of infrastructure: contributing to social sustainability	33
Policy recommendations	34
Notes.....	37

Summary

The scale of infrastructure delivery for reconstruction purposes in Ukraine is unprecedented, with the latest estimates standing at \$143 billion (considering only the housing and transport sectors), according to the latest World Bank and Government of Ukraine assessment. If Ukraine is to meet its EU integration and resilient recovery objectives, it would be crucial to ensure that the infrastructure delivered is sustainable; that is, it clearly integrates social, environmental, and economic considerations, including its financial sustainability and affordability.

Getting the infrastructure reconstruction right through ensuring it is sustainable is both in Ukraine's and donors' best interests

The stakes are high for getting Ukraine's reconstruction right, given the scope of infrastructure projects and financing they require, but also given the costs of failure to deliver sustainable infrastructure (SI). With the Ukrainian economy significantly impacted by the war, donors and international partners will play a key role in the reconstruction and recovery process with, for example, an EUR 50 billion Ukraine Facility dedicated to critical infrastructure needs and a World Bank Group provision of USD 35 billion in emergency financing. Hence, it is essential to ensure that international aid promotes and enhances the delivery of SI in Ukraine (e.g. through the adoption of mandatory sustainability requirements for reconstruction projects, accompanied by a robust monitoring and evaluation mechanism). Failure to ensure that reconstruction follows the sustainability path can result in a significant waste of resources and Ukraine's further economic and political downturn, as was the case with US efforts in Afghanistan's reconstruction. Over 20 years, the US spent USD 145 billion on rebuilding Afghanistan, with a third of infrastructure funding spent on assets that were either not used or abandoned and destroyed by the time US troops withdrew in 2021. Therefore, ensuring that the infrastructure delivered in post-war Ukraine is sustainable and Ukraine has the necessary skills and institutional, political, and other arrangements to operate and maintain the infrastructure in the long term is both in Ukraine's and donors' best interests.

SI may take longer but has substantial benefits in the long-term enabling a truly resilient and sustainable recovery and contributing to EU integration of Ukraine

Delivering SI will require doing things differently and might take longer than the conventional approach to infrastructure projects, but it is essential to enable the truly resilient recovery of Ukraine and its EU integration. New policy tools and approaches need to be introduced across multiple sectors, including construction, environmental protection, public procurement, and policy governance. Decarbonisation of the construction sector and its transition to a more sustainable path are crucial elements in delivering SI, accompanied by measures to ensure that infrastructure delivers social value. SI delivery makes a significant contribution to Ukraine's climate commitments, including achieving a 65% reduction in CO2 emissions by 2030 and climate neutrality by 2050, which are also part of the EU integration requirements. Failure to deliver SI would also result in a failure to achieve sustainable recovery for Ukraine and compromise the country's prospects for EU integration. It will also aggravate inequalities already exacerbated by the war (e.g. access to quality education, healthcare, etc.), negatively affect regional development, and ultimately impede delivering a better quality of life and societal cohesion that are crucial for rebuilding a resilient Ukraine. Hence, rebuilding infrastructure quickly will miss out on many of its sustainability aspects, costing Ukraine more in the future, both in terms of its European Union aspirations and resilient recovery objectives.

Infrastructure lacks strategic vision in reconstruction and recovery policy with sustainability not properly prioritised

While the importance of SI for Ukraine's recovery and reconstruction is clear, the role of SI in the current reconstruction policy is not. There is a lack of strategic vision of the infrastructure's role in enabling resilient and sustainable recovery aligned with EU integration objectives. Two sectoral draft recovery programs directly concerned with infrastructure lack clear prioritisation of sustainability in infrastructure projects and often set ambitious long-term goals that aim at SI delivery (e.g. the introduction of near-zero energy and zero-emission buildings starting in 2032) without properly addressing short- and medium-term needs through concrete policy mechanisms and details on their implementation, monitoring, and evaluation. A case in point is the gap in spelling out the infrastructure's role in achieving climate and environment targets that are critical for Ukraine's EU integration (i.e. EU Green Deal legislation implementation). A fragmented approach to infrastructure and missing focus on its sustainability with concrete implementation mechanisms outlined in the current reconstruction policy severely hinders SI delivery.

Regional development policy risks entrenching regional inequalities while spatial planning is outdated and lacks data challenging SI delivery

Regional development and spatial planning policies add to the challenging policy context of SI delivery. The recent legislation on regional policy, introducing four functional categories for territories of recovery, will have direct implications on the scale of infrastructure funding a given territory can mobilise and seems to lock sustainable development within only one type of territory, that is 'territories of sustainable development'. Such an approach risks entrenching pre-war regional development inequalities and exacerbating imbalances caused by the war while prioritising sustainability only in regions that are fairly well-off. Furthermore, master plans at the local level dating from before 1991 or missing, and spatial planning data gaps due to digital data unavailability and fragmentation across different systems and registrars, make planning for infrastructure a difficult undertaking. Thus, regional inequalities that risk being exacerbated by current policies and lack of a clear and coherent approach for infrastructure project implementation at the local level due to outdated spatial planning documentation and data significantly constrain effective SI delivery.

SI delivery hits the limits of local governments' capabilities to effectively implement infrastructure projects

With most of the expected infrastructure projects taking place at the local level, the delivery of SI relies heavily on the capabilities of local governments to implement them, and these capabilities are currently lacking. They have been severely impaired due to uneven development across regions before the invasion (i.e. Kyiv agglomeration driving country's economy with poor socio-economic development of many other regions) and aggravated since (e.g. north-eastern, eastern, and southern regions suffering the most from infrastructure destruction, and western and central regions receiving the majority of internally displaced persons and relocated businesses). The implementation of a place-sensitive approach can help address current regional imbalances and ensure that infrastructure meets the specific needs and development opportunities of given territories, encourages local initiatives, and helps to ensure a more bottom-up approach to infrastructure planning and regional development. Lacking local capabilities is therefore a major obstacle to deliver SI and would require substantial capacity-building support from the central government, donors, and international partners.

SI implementation is impossible without setting the construction sector on a more sustainable development path

To deliver SI for Ukraine's reconstruction, it would be important to tackle major challenges in the construction sector, which is overregulated and suffers from low innovativeness, productivity, competitiveness, and high carbon intensity. The decarbonisation of the construction sector and increasing its energy efficiency are among the priorities of the relevant draft recovery programme which foresees the introduction of near-zero-energy buildings (NZEB) and zero-emissions buildings (ZEB) as key drivers in this process. However, the decarbonisation of the construction sector can and should be accelerated by integrating new technologies and policy tools that target environmental sustainability. For instance, a review of the design code can help reduce waste, while mandatory carbon and environment assessment would support the achievement of decarbonisation and energy-efficiency targets. Introduction of technology such as Building Information Modelling (BIM) can be instrumental in increasing the transparency of investment and construction processes, and making infrastructure delivery more efficient (e.g. cost reduction both in the short and long term) and sustainable (e.g. longer asset life, compliance with environmental requirements). Decarbonisation of the construction sector is an essential element to SI delivery and could benefit from available international practices and technologies.

Social sustainability has a lot to do with engagement of local communities into decisions on infrastructure

Intentional engagement of communities in decision-making on infrastructure projects contributes to the sense of ownership and involvement in reconstruction within the population, can help deliver infrastructure tailored to the needs of the population, enhances trust in local government, and contributes to social cohesion. This approach is particularly relevant in the context where a third of Ukrainian population is not satisfied with the Government's actions on reconstruction and where several decisions by local authorities on infrastructure reconstruction were strongly criticised by citizens. Such engagement can be adapted to different stages of infrastructure project delivery and draw on international practice (e.g. the IAP2 spectrum for public participation). Bypassing Ukrainian citizens on reconstruction decisions is a dangerous path that erodes trust in public authorities, undermines social cohesion, and reinforces the thinking that private interests rather than public interest are driving the decision-making process.

Citizen engagement is also a means to ensure infrastructure creates social value starting from its design

Infrastructure reconstruction can and should be used to deliver social value, that is, the effect on people's well-being and community life, with the design stage of infrastructure projects playing a crucial role in enabling social value generation along the asset life cycle. Integration of people's views into decision making on the design of infrastructure assets is, hence, a valuable input to the social sustainability of infrastructure. Such engagement of the community provides a sense of ownership and involvement, connects people with places, promotes health and wellbeing, and enhances social cohesion. It can take the form of a survey or consultation with residents and local stakeholders, feedback on design solutions proposed by the constructor, working groups, etc. Bypassing citizens when conceiving an infrastructure asset that will have a long-term impact on the community may result in failure to provide for the social sustainability of infrastructure.

Policy recommendations

1. At the level of national reconstruction and recovery policy, adopt a strategic vision of sustainable infrastructure and its role in delivering Ukraine's resilient recovery and EU integration objectives (including compliance with EU Green Deal).
2. Clearly prioritise sustainability of infrastructure in draft recovery programmes directly concerned with infrastructure and include concrete mechanisms for implementation, monitoring, and evaluation of measures to ensure SI delivery in the reconstruction process.
3. Ensure that sustainability is a priority for all four functional types of territories for recovery introduced by recent legislation on regional development to avoid locking sustainability within only one type of territory, i.e., "territories of sustainable development", and contribute to aggravating regional disparities exacerbated by the war.
4. To address spatial planning data gaps and fragmentation and introduce a single information system for urban planning at the state level to enhance the transparency and effectiveness of infrastructure delivery.
5. Build the capabilities of local governments to deliver SI through dedicated training, knowledge, and experience sharing, with engagement of donors and international partners and central government initiatives aimed at supporting infrastructure planning and implementation (e.g. regional offices of Restoration Agency).
6. Implement a place-sensitive approach to regional development to address current regional imbalances and facilitate the delivery of infrastructure that meets the specific needs and development opportunities of given territories.
7. Promote decarbonisation of the construction sector through the introduction of new policy tools that target environmental sustainability, such as revision of design codes to reduce waste and mandatory carbon and environment assessments for infrastructure projects at procurement and asset design stages.
8. Roll out the Building Information Modelling (BIM) technology in Ukraine first as a pilot project based on voluntary BIM application at a basic level (2D/3D CAD) and gradually make BIM mandatory for projects where the state is investing above a certain threshold, in line with European practice.
9. Ensure citizens' engagement in decision-making on infrastructure delivery through adaptation of the International Association of Public Participation (IAP2) spectrum for public participation (i.e. inform, consult, engage, empower) to enhance trust between citizens and public authorities and develop a better sense of ownership and involvement in reconstruction.
10. Engage citizens in decisions on the design of infrastructure through surveys, consultations, or other methods to ensure that infrastructure creates social value throughout its life cycle, promotes health and well-being, and enhances social cohesion.

Introduction: What is sustainable infrastructure (SI)?

The Global Infrastructure Hub defines sustainable infrastructure (SI) **as infrastructure that delivers long-term economic, social, and environmental (ESE) benefits**¹. From the process standpoint, SI is also delivered in a financially sustainable manner. The parameters of infrastructure sustainability are detailed as follows:

- *economic sustainability*: generating positive economic return (i.e. calculation of the net present value (NPV) calculation and economic rate of return (ERR)) with contribution to jobs and value creation;
- *Social sustainability*: contributing to local development, including population well-being and community life, and mitigating adverse social impacts of the projects (e.g. changes to resource access).
- *environmental sustainability*: ensuring environmental protection (i.e. leveraging natural resources and ecosystems in a sustainable manner) and contributing to climate resilience;
- *financial sustainability*: ensuring infrastructure projects are financed through a robust structure that achieves affordability for consumers without overburdening the Government with long term debt (i.e. costs of financing and distributional consequences)².

SI is ultimately about the ability of infrastructure to last over a period of time causing little or no damage to the environment and delivering additional benefits for the communities by creating social value.

The UN defines sustainability as ‘meeting the needs of the present without compromising the ability of future generations to meet their own needs’³, which highlights the importance of integration of a long-term perspective into infrastructure delivery decisions. Thus, **the longevity, or the ability of infrastructure to last over a period of time causing little or no damage to the environment⁴ in line with the sustainable development objectives and creating social value for communities⁵ is what SI is ultimately about.**

For the purpose of this paper, the infrastructure is defined as physical assets in housing, transport, and social sectors (schools, hospitals, etc.)⁶. The energy infrastructure was not covered by this analysis, whereas water/wastewater and waste management infrastructures were only mentioned when relevant for the analysis.

1. Why SI for Ukraine?

Infrastructure investments and availability are not only a key driver of the economic post-war recovery of Ukraine, but are also a crucial element of delivering sustainable economic growth globally. With infrastructure responsible for 79% of total greenhouse gas emissions⁷, ensuring that infrastructure helps to achieve Sustainable Development Goals (SDGs) and the Paris Agreement targets would require annual \$3bn investments by 2050 in sustainable infrastructure, with 70% of the spending required in emerging markets and developing economies⁸.

The scale of infrastructure delivery for reconstruction purposes in Ukraine is unprecedented with latest estimates standing at \$143 bn (housing and transport sectors combined), according to the World Bank and the Government of Ukraine report⁹. It would be crucial to ensure that the

infrastructure delivered in this process is sustainable, i.e., it clearly integrates social, environmental, and economic considerations in the long-term, and is financially sustainable and affordable.

SI can help improve quality of life, make cities and rural communities attractive places to live and work in, and facilitate the return of displaced populations home.

Delivering SI in Ukraine is not only a responsible thing to do given the global challenge in addressing climate change, but also imperative **if Ukraine is to deliver on its climate commitments, including achieving 65% reduction in CO2 emissions by 2030 (from 1990 levels) and contributing to the European Green Deal for climate neutrality by 2050, as part of the EU integration¹⁰.**

SI would also make a key contribution to Ukraine's national security objectives, as energy-efficient and low carbon infrastructure will accelerate Ukraine's transformation from a

fossil-fuel intensive to a greener economy, thus strengthening country's energy independence, including from Russia, and helping to realise the ambition to become a "clean energy hub" for Europe¹¹.

Delivering SI which meets people's needs and generates more social value, i.e., the direct, positive impacts for people and communities that can be created through the built environment¹², **is in line with Ukrainian Government's ambition to develop strong human capital and modernised energy-efficient infrastructure¹³.** SI can help improve quality of life, make cities and rural communities attractive places to live and work in, and facilitate the return of displaced populations home.

1.1. Rebuilding better and more sustainably is in Ukraine's and donors' interests

As Ukraine is looking to secure its place as a member of the European Union (EU), investments in Ukrainian recovery should reinforce country's profound economic transformation in line with the EU norms and regulations, including the sustainability objectives as reflected in the EU Acquis (e.g., EU's Green Deal). With Ukrainian economy significantly impacted by the war, donors and international partners will play a key role in reconstruction and recovery process with, for example, a EUR 50 billion Ukraine Facility dedicated to critical infrastructure needs¹⁴ and World Bank Group's provision of USD 35 billion in emergency financing¹⁵. Hence, **aligning its reconstruction path with the EU's sustainability objectives becomes crucial for Ukraine's short-term recovery and longer-term economic and political development, increasing the chances of securing EU membership.**

Strong and democratic Ukraine firmly advancing on the path of sustainable development is also an important element of the EU's security and economic development. Delivering sustainable infrastructure for recovery in Ukraine would make the best use of the EU's funds provided for this purpose and contribute to a more stable and prosperous Ukrainian state at the EU's eastern borders, diminishing internal European economic and social pressures. Furthermore, with its large industrial base, rich resources, relatively cheap, skilled and well-educated labour, Ukraine can become a highly competitive manufacturing sector and positively contribute to EU's economic growth and productive capabilities¹⁶. Hence, getting Ukraine's recovery right, i.e., ensuring that investments made in infrastructure deliver the intended value in the long-term, is in Ukraine's and its partners' interest.

It is crucial for the donor community to actively support the adoption of mandatory sustainability requirements for reconstruction projects, accompanied by a robust monitoring and evaluation mechanism.

In this regard, it would be important **not to repeat the mistakes of previous reconstruction efforts undertaken by the international community and major donors**. The reconstruction of Afghanistan is a case in point. Even if not directly comparable with Ukraine (e.g. local capabilities for recovery, type of conflict, and its intensity throughout the period), the scale of destruction and of investments for reconstruction (\$145 billion over 20 years by US alone) were very

significant and hold important lessons for the Ukrainian context. Among the key lessons learnt, as highlighted in the report of the US Special Inspector General for Afghanistan Reconstruction (SIGAR), is the need to ensure sustainability of infrastructure delivery starting from its design (timeliness, implementation tools) through its implementation and transfer of assets to local authorities for operation and maintenance, which relies on the local context and capabilities of local authorities to implement and sustain reconstruction projects.

Political pressures to show quick results, lack of understanding of the local context, including infrastructure needs and lacking local capabilities, and, most importantly, lack of sustainable approach to reconstruction, made US reconstruction effort in Afghanistan look like a “20 one-year reconstruction efforts, rather than one 20-year effort”¹⁷. This led to a situation where despite being emphasised by policies and on paper, sustainability requirements were rarely implemented in practice¹⁸.

It is telling that the failure to ensure sustainable reconstruction, that was supposed to include “building of necessary institutions of government, civil society, and commerce to sustain the country indefinitely”, **has had a major contribution to a quick fall of the Afghan Government following the US troops withdrawal in 2021**. Short-termism of US officials in charge of reconstruction together with lacking capabilities of Afghan government, coupled with other factors¹⁹, resulted in significant waste of resources, as **around 31% of funding spent on capital assets, such buildings, transmission lines, roads, and bridges, was spent on assets that were not used as intended, remain unused, or had been abandoned or destroyed**²⁰.

In the case of Ukraine, it would be crucial for the donor community to actively support the adoption of mandatory sustainability requirements for reconstruction projects, as well as to ensure that these are closely observed through robust monitoring and evaluation mechanism. While Ukraine has some capabilities for project implementation, those require substantial strengthening, in particular when it comes to local governments which would be ultimately responsible for most infrastructure projects and assets. **In addition to the sustainability-grounded infrastructure delivery approach, ensuring close alignment of donor funding with Ukrainian Government reconstruction objectives is critical to avoid waste of resources and duplication of efforts, and enabling truly sustainable infrastructure reconstruction**²¹.

1.2. SI delivery requires new policy approach and might take longer

Delivering SI would require doing things differently and might take longer than the conventional approach to infrastructure projects. In fact, such an approach should include considerations related to the social value of infrastructure and compliance with environmental requirements. The mechanisms for implementation of the SI approach could take different forms, including a mandatory environmental impact assessment for infrastructure projects and sustainability in outcome-based specifications in the procurement process, a monitoring and evaluation system for sustainability

requirements in construction, efficient use of construction materials to cut down construction waste, engaging communities in decisions on infrastructure to ensure it delivers social value, etc.²² **In the context of Ukraine, these mechanisms require changes in legislation, new regulation (e.g. amendments to building code), capacity-building activities for the construction sector, and public authorities,** which inevitably takes longer than just rebuilding based on old frameworks.

Missing out on the opportunity to set the construction sector in Ukraine on the path of sustainability during reconstruction phase compromises Ukraine's sustainable and resilient recovery and its EU membership.

For example, **a life-cycle management of public and residential buildings that the Government of Ukraine plans to implement, would take time to put in place (adoption of new regulation, introducing life-cycle cost analysis, integration of relevant technologies by construction companies, such as BIM).** The

deployment of such approach in full is not expected before 2032, as per the draft plan of the Government²³. Hence, Ukraine is missing much of the economic (e.g. savings in repair and maintenance) and environmental (e.g. energy efficiency and emissions reduction through innovative design and technology) benefits of the life-cycle approach to infrastructure management that can help to advance on Ukraine's "green agenda" in line with the EU accession requirements and rebuild in a more sustainable way.

The choice between implementing sustainable solutions in construction now and leaving their implementation until later, once the urgent needs are covered, is not an easy one in a situation of ongoing destruction of civilian infrastructure due to regular shelling of Russian military. **However, it is clear that missing out on the opportunity to set the construction sector in Ukraine on the path of sustainability during the reconstruction phase compromises Ukraine's sustainable and resilient recovery and its EU membership, taken that the "green agenda" is not put into practice.** Transitioning to less carbon-intensive buildings and more efficient, innovative and sustainable ways of construction will not only reduce costs in the long-term but also mitigate negative effects on climate, contribute to environmental safety objectives and Ukraine's climate mitigation and adaptation efforts. In addition, continuing in the same path as before during the reconstruction will enhance existing dependencies²⁴ (e.g., over-use of materials, lack of integration of energy efficiency and carbon emissions considerations) and make the change even harder later on, entrenching unsustainable practices with significant negative impact for Ukraine's development, given the substantial scale of reconstruction.

The realisation that delivery of infrastructure as before is not an option and will cost more in the long term, in economic, societal, and environmental terms, should be at the core of the reconstruction thinking and policymaking in Ukraine.

The realisation that delivery of infrastructure as before is not an option and will cost more in the long term, in economic, societal, and environmental terms, should be at the core of the reconstruction thinking and policymaking in Ukraine. For example, building back according to the old model will reinforce Ukraine's dependence on fossil fuels and make its economy not only uncompetitive in the long term, but also impede EU accession and threaten energy security. Russia was a key supplier of fossil fuels to Ukraine, even in 2019, especially coal (roughly ¼ of domestic consumption) and oil (more than 50% imported directly or indirectly – via Belarusian refineries – from Russia)²⁵. Such dependence presents a major threat to national security in the context of ongoing Russian military aggression against Ukraine and Ukraine's post-war future.

Furthermore, **going back to old ways of construction that do not put people and communities at the centre will aggravate inequalities already exacerbated by the war** (e.g. access to quality education, healthcare, etc.), **negatively affect balanced and inclusive development of territories, and ultimately impede delivering better quality of life and societal cohesion** that are crucial for rebuilding a resilient Ukraine.

Finally, reconstruction efforts should incorporate thinking about future generations of Ukraine in such a way that they ensure that

- whatever we rebuild is as fossil-fuel-free as possible, has a low carbon footprint, and ensures energy efficiency;
- infrastructure is resilient to future shocks, including natural disasters, military conflicts, and demographic changes.;
- infrastructure adequately meets the needs of Ukrainian population and sets foundations for robust sustainable, inclusive, and balanced development of communities.

This section has made the case for delivery of sustainable infrastructure to ensure Ukraine’s resilient recovery and longer-term development as a prospective member of the EU. Section 2 analyses current vision of infrastructure by the Government of Ukraine across reconstruction, regional development and spatial planning policies in the context of post-war recovery. It notes opportunities and challenges for delivering SI given strategic vision and policy frameworks in place. Sections 3 and 4 look into implementation of SI through innovative construction practices and stronger local communities’ engagement in infrastructure delivery, respectively. The choice of these topics is motivated by their salience for SI delivery and the Ukrainian context. Finally, the section with conclusions and recommendations summarises the key finding of this report.

2. Delivering SI: strategic vision and policy governance

This section analyses the approach to infrastructure taken by the Government of Ukraine across three main policy areas: restoration and recovery policy, regional development policy, and spatial planning. It outlines developments across the abovementioned policies that have direct implications for infrastructure delivery and identifies the main challenges and opportunities for the implementation of SI projects. The table below summarises this information (Table 1).

Table 1. Policies relevant for sustainable infrastructure delivery in the recovery context

	Reconstruction and recovery	Regional Development	Spatial Planning
Challenges	Lack of focus on sustainability overall and in case of infrastructure (i.e., lack of integration of social and environment sustainability considerations); Lack of concrete mechanisms for implementation and monitoring of set objectives;	Overlap and duplication between strategic documents increasing pressures on local governments operating in challenging context; Functional specification of territories potentially reinforcing uneven regional development and exacerbating inequalities with missing role of sustainability in driving	Outdated spatial planning at local level creating room for inefficiencies for delivering infrastructure planning; Lack of single information system for spatial planning at the state level; Fragmented data on spatial planning, lack of its digitisation (e.g., different registrars and archives not

	Highly declarative nature of draft action plans.	harmonious regional development.	linked to each other and not fully digitised).
Local government capabilities to implement sustainable infrastructure projects.			
Opportunities	The priority objective of EU integration and subsequent harmonisation of legislation can serve a powerful driver for delivery of sustainable infrastructure (e.g., alignment with EU Green Deal with impacts for construction and transport sectors).	Introduction of three-level regional development plans and functional types of territories for recovery provides clarity for strategic development and opportunities for local government initiatives, if the principle of subsidiarity is upheld.	Introduction of comprehensive spatial plans of territorial communities and plans to create the Geoinformation system Urban Planning Cadaster at the State Level will enable more transparent and accountable spatial planning system.
Building local capabilities for SI delivery through engagement of available international support, and drawing on national and foreign good practices with assistance of donors			

2.1. Developments in the area of reconstruction policy that affect SI delivery

Before analysing sectoral recovery plans with relevance to infrastructure, it would be important to outline the institutional arrangements for Ukraine’s reconstruction. For the purposes of this report, the terms *reconstruction* or *restoration* refer to repairing or rebuilding of physical and social infrastructure that was damaged or destroyed during the war, while the term *recovery* refers to reviving of economic activities and social networks that enable structural transformation of the Ukrainian economy, its governance structures on the way to the EU integration²⁶. Such clarification in the use of terms is due to varying translations of the term “відновлення” used by Ukrainian Government in its official documentation when talking about reconstruction and the nuances of the meaning associated with *reconstruction* and *recovery*.

Finally, it is worth noting that in some areas of Ukraine that were liberated from the Russian military in 2022 (e.g. Kyiv, Chernihiv, Kharkiv regions), the reconstruction has already started, with particular focus on residential buildings and social infrastructure. In areas that suffer from regular shelling, the repairs of residential buildings and social and critical infrastructure take place on an ongoing basis to ensure the provision of basic services to the population.

Reconstruction - repair or rebuilding of physical and social infrastructure that was damaged or destroyed during the war;

Recovery - reviving economic activities and social networks that enable structural transformation Ukraine, incl. on its way to becoming an EU member.

Institutional set-up of Ukraine’s reconstruction

At the strategic policy level, **the National Council for the Recovery of Ukraine from Consequences of the War (the National Recovery Council)**, established in April 2022 by the President, co-chaired by the President of the Verkhovna Rada of Ukraine (VRU), the Prime Minister, and the Head of the Office of the President of Ukraine, **is overseeing the development of restoration and recovery policy**. The Recovery Council comprises Vice Prime Ministers and ministers of the CMU, chairpersons of relevant VRU committees, the Secretary of the National Security and Defence Council, the Chairman of the National Bank of Ukraine, and the Permanent Representative of the President of Ukraine in the

Autonomous Republic of Crimea. It prepared the draft Ukraine Recovery Plan (URP) which was presented at the Lugano Conference on Ukraine’s recovery in June 2022.

The delivery of infrastructure for recovery is overseen by the Ministry of Communities, Territories, and Infrastructure Development (MCTID), also called the Ministry of Restoration. Its creation is a result of the merger of the Ministry of Infrastructure and the Ministry of Regional Development. As infrastructure plays a major role in the recovery process, which is concerned, in practical terms, with regions and local communities, it is a positive and logical step to have one ministry supervising both aspects. **However, there is a risk that infrastructure-related portfolios overshadow the regional development mandate of the Ministry, creating new and reinforcing existing regional imbalances that resulted from the pre-war and war time contexts** (e.g. some regions under pressure to provide for the needs of internally displaced persons and business relocation, others suffering from considerable destruction and depopulation).

The Agency for Restoration and Infrastructure Development, established in January 2023 by merging the former State Road Agency with the State Agency for Infrastructure Projects, **is mandated to support the implementation and operational management of reconstruction projects.** However, it will not be able to support the implementation of every infrastructure project, given limited resources. Rather, the Agency is expected to define a portfolio of priority projects in war-affected regions and support their implementation.

On the policy side, the reconstruction efforts are guided by the **Ukraine Recovery Plan** which consists of 24 sectoral programmes. It explicitly addresses infrastructure in two programs, i.e., **“Construction, urban planning, modernization of cities and regions²⁷”,** and **“Recovery and development of infrastructure²⁸”.** The programs outline main problems, objectives and priority activities and are in essence, draft action plans, prepared by the dedicated working groups of the National Recovery Council ahead of the Lugano Conference for Ukraine’s reconstruction held in July 2022²⁹. The drafts have not been approved by the Cabinet of Ministers of Ukraine but are a useful tool for understanding of Government’s strategic vision of infrastructure reconstruction and its role in country’s recovery³⁰. The programmes take different approaches to sustainability and cover sustainable infrastructure delivery to different degrees, as Table 2 shows. Below is an analysis of each of the programs.

Figure 1. Brief institutional set-up of Ukraine’s reconstruction and recovery policy



Brief overview of the “Recovery and development of infrastructure” draft programme analysis

This draft programme essentially covers transport infrastructure and logistics and emphasises the importance of alignment and harmonisation of the Ukrainian transport system with the EU system. It also highlights the venues for transport infrastructure modernisation to support the longer-term economic development of the country with a focus on trade. The program explicitly refers to the need to find sustainable mechanisms and sources of funding for transport infrastructure restoration. It also focuses on introducing global best practices in design and construction, repair and maintenance of rail networks, roads, and modernisation of ports through the use of new technologies, and diversification of modes of transportation with the development of multimodal hubs to facilitate trade. **While activities outlined in the draft promote innovation and modernisation, the programme does not prioritise sustainable transport infrastructure construction, operation, and maintenance. For example, it has no mention of actions to ensure transport infrastructure decarbonisation, promotion of green transportation, and sustainable transport construction methods** (e.g. low-impact design practices, using recycled or sustainable materials in construction and maintenance).

The programme explicitly refers to the need to find sustainable mechanisms and sources of funding for transport infrastructure, but does not address the decarbonisation objective, green transportation or sustainable construction practices.

Given that the transport sector is an important contributor of greenhouse-gas emissions (GHG) (e.g., it represents 28% of total emissions in the EU)³¹, ensuring that transport infrastructure is less carbon intensive, starting from its design through to operation and maintenance, is crucial for Ukraine’s contribution to climate mitigation efforts. **In the case of the construction of new transport infrastructure, it is important to ensure that it is less fossil-fuel reliant,**

and minimise pollution and resource use by turning to reusable, recyclable, and recoverable materials. Transport infrastructure also plays a crucial role in fostering inclusive societies and improving quality of life; hence, social sustainability considerations should also guide decision making in this area.

Hence, **the existing draft program for transport infrastructure recovery largely lacks social and environmental sustainability aspects.** Under ongoing pressures to meet the urgent transportation needs to ensure goods and passenger flows and the poor state of existing transport infrastructure due to systemic pre-war challenges, it can be difficult to think beyond transport infrastructure restoration and modernisation. **However, sustainable transport infrastructure requires thinking one step further: ensuring that damaged assets are restored in a sustainable way, and new assets deliver social and environmental sustainability benefits.** Such longer-term strategic thinking is important for Ukraine’s energy security and EU integration objectives.

Brief overview of the “Construction, urban planning, modernization of cities and regions” draft programme

This programme clearly states that the reconstruction of Ukrainian regions needs to be done in a sustainable way, with consideration for future generations, aligned with the UN SDGs. In fact, the programme aims to deliver inclusive, “green”, energy efficient housing and social infrastructure that enables the return of displaced population, enhances quality of life and energy security, and meets corresponding requirements for the EU accession³². To achieve this, the objectives across housing,

construction, energy efficiency in buildings, heating, water and sewage, as well as waste management are set out along with proposed actions for their achievement.

Housing infrastructure activities are focused on reducing building energy consumption and transitioning to renewable sources of energy for heating. Ukrainian housing stock is comprised of around 80% of buildings constructed during soviet times which do not comply with modern energy efficiency requirements³³. The worn-out heating infrastructure, heavily reliant on natural gas, also contributes to the energy inefficiency of buildings, with 40% of the heating networks in Ukraine requiring replacement due to age and damage resulting from hostilities. Such energy inefficiency makes residential and non-residential buildings in Ukraine 30 to 50% more energy-intensive than buildings in Europe.

The draft programme does not specify which sustainability requirements need to be followed when restoring damaged housing stock. It does, nevertheless, outline major changes required in the construction sector to increase sustainability of construction and align the sector's operation with EU practices and requirements (this will be discussed in more detail in Section 3). The program also suggests the introduction of energy-efficiency measures, including the integration of renewable sources of energy for heating,

The draft programme sets ambitious plans for near zero-energy buildings and zero-emission buildings but does not specify sustainability requirements for immediate restoration of damaged housing stock (e.g., social and environmental sustainability criteria).

adequate insulation methods, sustainable use of materials in the restoration of damaged buildings, and the construction of less energy-intensive and carbon-emitting buildings. For instance, the draft plan foresees the introduction of near zero-energy buildings and zero-emission buildings, and sets targets for decarbonisation of the construction sector and its energy efficiency improvement by 13% by 2025. However, **the mechanisms for the implementation of these objectives and their further monitoring and evaluation are not entirely clear, even if the draft includes a list of legal acts to put these objectives into practice.**

The environmental sustainability aspect of reconstruction is mostly addressed in a separate draft programme but it does not address role of infrastructure in achieving climate and environment objectives, and does not contain mechanisms for their implementation.

The expected quick pace of housing reconstruction, perfectly understandable given the number of displaced persons, may, nevertheless, overshadow the sustainability and decarbonisation considerations in the housing sector. For example, the programme foresees that by 2025, 50% of citizens who have their housing damaged or destroyed are provided with compensation which can take the form of capital

repairs and reconstruction, housing construction, and purchase of housing. **At the same time, with no requirements for sustainable restoration of buildings, the envisaged reconstruction efforts risk falling short of ensuring a "green" recovery objective.** In addition, delivery of sustainable housing requires mobilising expertise and necessary construction materials and equipment which Ukraine may have difficulties accessing due to supply chain interruptions, higher prices for materials, outflow of skilled workforce, and lack of in-house expertise. **International donors and partners can play a key role in enabling technology and skills transfers in sustainable construction if the Government of Ukraine is to lead the way in enforcing socially and environmentally sustainable housing infrastructure delivery.**

Finally, given the impact of infrastructure on the environment and its role in reaching net zero, it is important that infrastructure reconstruction is addressed from the environmental policy perspective.

The previous two programmes directly concerned with infrastructure do not sufficiently address the environmental sustainability aspect. It would be reasonable to suppose that a programme on “Environmental Safety”³⁴ elaborated under the Recovery Plan would contain elements in this regard. However, while the programme envisages to align Ukraine’s legal framework in environmental protection, climate and sustainable use of natural resources with the requirements of EU legislation (EU Green Deal package) in the recovery process, **it does not specify mechanisms for implementation and monitoring of environmental and climate targets it sets^{35 36}, nor does it address the role of infrastructure in reaching those targets.** Aligning Ukraine’s legislation with the EU Green Deal would mean, among other things, transposing measures on digitalisation and climate-proofing of the building-stock³⁷, preference for renovation of old buildings, enforcement of Construction Product Regulation (CPR), and the Energy Performance of Buildings Directive (EPBD), as well as introduction of a potential Building Emission Trade System (Building ETS)³⁸.

Overall, three analysed programmes reflect the siloed approach to infrastructure, with the environmental sustainability component not being properly addressed and the social sustainability aspect addressed only marginally (e.g. social housing, human capital development, territorial cohesion programme). In addition, the programmes mostly lack clear mechanisms for the implementation and monitoring of set objectives, even if the draft includes a list of legal acts to put these objectives into practice as the first step. Finally, infrastructure does not seem to be a powerful means to accelerate the green transition agenda, one of the key components of EU integration, and deliver sustainable post-war recovery.

A siloed approach to infrastructure in reconstruction policy highlights the lack of strategic vision of infrastructure’s role in sustainable reconstruction as a powerful driver for advancing on green transition and EU integration agendas.

Table 2. The approaches taken to sustainability of infrastructure across relevant programmes of the Recovery Plan³⁹.

Programme	Some activities that consider sustainability aspects
Recovery and development of infrastructure (logistics and transport)	<ul style="list-style-type: none"> • Development of new technologies aimed at the transition to sustainable aviation fuels (SAF), the adoption of global market measures for reducing carbon emissions (CO₂) under the System of Compensation and Reduction of CO₂ Emissions for International Aviation (CORSIA program). • Optimization, clarification of the existing boundaries of water areas, seaports of Mykolaiv, Olviia, Pivennyi, Odesa, Chornomorsk, Kherson, Ust-Dunaisk, Izmail to ensure their sustainable development, increase cargo flows, reduce costs and ensure the safety of navigation. • Harmonization of legislation with EU legislation on tolling in order to ensure sustainable funding for their maintenance and repair.
Construction, urban planning, modernization of cities and regions	<ul style="list-style-type: none"> • Developing plans for infrastructure reuse, and adaptation (e.g., into social infrastructure) including the criteria for energy-efficiency, inclusion; • Developing methodology for estimating the cost of the life cycle of a building, for setting requirements in maintenance of operational suitability of buildings; • Implementing construction projects using BIM technologies; • Raising public awareness of sustainable energy development of communities and regions; • Introduce long-term programs at the state and local levels to support thermal modernization of buildings and construction near zero-energy buildings (NZEB); • Increase energy efficiency (including natural gas) by up to 90% in heating sources of residential and public buildings by 2025; • Ensure the recovery of destroyed buildings to the energy efficiency class not lower than B; • Ensure replacement of 22% of natural gas with renewable energy sources in individual and autonomous heating systems of buildings by 2032; • Establish mandatory compliance with NZEB requirements for new construction of all public buildings by 2032; • Reduce the specific consumption of electricity from centralized sewage systems by 20% from the base year 2021 by 2032.
Environmental safety	<ul style="list-style-type: none"> • Reconstruction of destroyed infrastructure and structural economic recovery based on clean, low-carbon and energy-efficient technologies, integration into EU industrial alliances and participation in new production chains. • Launch operations of the National Greenhouse Gas Emissions Trading System continue implementation and monitoring of projects to mitigate and adapt to climate change, introduce full-fledged infrastructure for recovery, regeneration recycling and utilization of ODS, including CFCs and HCFCs. • Delivering waste management infrastructure which would comply with EU standards, in particular the BAT. • Ensuring Ukraine’s full-scale participation in implementation of Articles 6–10 of the Paris Agreement that would facilitate “green”, sustainable and strong recovery of the infrastructure, industry and natural ecosystems. • Integration of the climate mitigation and adaptation components into the planning documents of regions and territorial communities (i.e., as part of the environment assessments).

2.2. Developments in the area of regional development policy affecting SI delivery

Ukraine's regional development policy aims to "to create conditions for the dynamic, balanced development of Ukraine and its regions, to ensure their social and economic unity, to raise the standard of living of the population, to create safe conditions, and to maintain state-guaranteed social standards for every citizen, regardless of their place of residence" ⁴⁰. Infrastructure plays a key role in achieving these goals, with local governments directly concerned with its delivery and impact on shaping their communities at economic, social, and environmental levels. In this regard, it is important infrastructure needs are considered in local governments' medium and long-term development strategies⁴¹.

In the aftermath of the large-scale Russian aggression, two laws were adopted to guide regional development policy which has direct implications for infrastructure projects delivery⁴². The laws stipulate development by regional and local authorities of planning documentation for restoration very similar in their contents and objectives, and hence raise questions about alignment, complementarity, and overlap between documents, especially given the ongoing challenging context of war and lack of resources at the local level. International experts have recommended to integrate these two planning documents into one and specify medium and long-term considerations which are crucial for sustainable regional development⁴³. Most importantly, **the latest legislation introduces a differentiation principle for territorial development with the funding of reconstruction initiatives by the local authorities**. The following section sheds light on these arrangements.

New legislation on regional development for restoration and impact on SI delivery at local level

The first law, i.e., Amendments to the Law on Urban Planning, approved on May 12, 2022, introduced comprehensive restoration programme to be prepared by regions and local communities which suffered from the armed aggression or in which socio-economic, infrastructural, ecological or other crisis phenomena are concentrated⁴⁴. The restoration programmes will define the main spatial, urban planning and socio-economic priorities of the restoration policy and include a set of measures for ensuring the restoration of a territory⁴⁵. They will assess the technical and economic feasibility of restoring damaged infrastructure (at the regional level) and buildings (at the local level).

The second law, amending state regional policy, adopted on 9 July 2022, established a three-level system of planning of regional development, which includes national, regional, local (territorial communities)⁴⁶ planning documents. Thus, the restoration and development plans have to be developed at regional level and at the level of territorial communities⁴⁷. However, the required content of planning documentation fails to incorporate medium-term perspective for development, along with the vision of modernisation (stipulated by the Ukraine Recovery Plan), thus missing out on many sustainability considerations for infrastructure and regional development⁴⁸.

The law also differentiates territories of Ukraine into four functional categories. This is highly relevant for infrastructure delivery in the context of reconstruction, as the functional type attributed to a territory will have direct effect on the scale of funding the territory can hope to mobilise for its infrastructure projects.

The law amending state regional policy adopted on 9 July 2022, introduced four functional categories of territories for recovery with direct impact on funding of infrastructure projects. Categories include:

- territories of recovery
- poles of economic growth
- territories with special conditions for development
- territories of sustainable development

The first functional category the law establishes is **“territories of recovery”**. It comprises territories where hostilities took place or which were temporarily occupied, suffered destruction of critical, social and housing infrastructure, have a sharp deterioration in development and significant displacement of the population. This description currently corresponds to roughly 20+ percent of the territory of Ukraine, mostly in the east and in the south, but also parts in the north (Chernihiv, Kyiv region de-occupied territories) severely affected by the war. *The infrastructure needs here are focused in housing sector, social infrastructure, transport networks, industrial/business sites.*

The second category, called **“poles of economic growth”** are territories having better performance on economic, social and demographic indicators, compared to similar territories, and whose growth and development has positive spillovers for bordering regions and the country. Regions in the western part of Ukraine that have seen less infrastructure damage and an inflow of internally displaced persons and businesses that relocated could be potentially counted in this category. *Here the infrastructure needs evolve mostly around making sure the infrastructure capacities can meet the demands of the growing population and businesses.*

The third category, **“territories with special conditions for development”** comprises communities that have low socio-economic development or face challenges (i.e., natural, demographic, security, international, etc.) in utilising the potential of their territory. The territories in the centre of Ukraine can be broadly counted in this category. Mostly rural, depending on agriculture and lacking higher value-added activities, these territories had suffered from depopulation, negative economic and social development trends prior to the outbreak of war. *Infrastructure investments will potentially focus on enhancing connectivity through transport infrastructure to foster business development and attract investors, as well as social infrastructure to help bring the population counting to return home.*

The last category, **“territories of sustainable development”** represent communities that are self-sufficient with high socio-economic potential and capable of balanced development in the economic, social and ecological spheres. The formulation is quite vague but could imply territories that have had good economic growth rate and, potentially, pilot projects to promote sustainable development with the support of international partners. *For this category, the infrastructure needs might evolve around the piloting and implementation of new technologies and sustainable solutions for potential scale-up in other territories of Ukraine.*

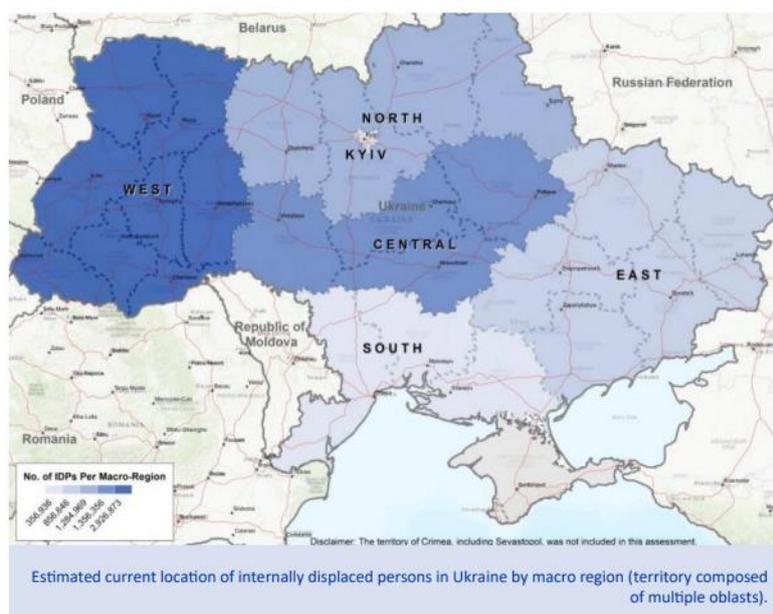
While the approach to the differentiation of territories is a useful step to facilitate and organise the implementation of reconstruction projects, the fact that only one functional category is marked by sustainability is problematic and reflects a predominantly narrow approach to sustainability among Ukrainian policymakers. In fact, this approach seems to state that only certain territories in the aftermath of the war are capable of pursuing the path of sustainability, while the rest of the territory of Ukraine will follow a less sustainability-focused development succumbing under immediate pressures. **This frames sustainability as something that only relatively well-off territories can achieve and not as an overall**

objective of reconstruction, including in the territories severely affected by the war. Furthermore, such an approach risks entrenching the pre-war path-dependent development of some territories (e.g. Table 3) and exacerbating imbalances caused by the war (Figure 2). To meet the objectives of the Law on Ukraine on Regional Development stipulating balanced development of territories, it would be crucial to ensure that all territories are developing in a sustainable way, even from a different baseline.

Table 3. Ukraine’s Gross Regional Product, share in total %, 2019⁴⁹

1	Kyiv city	23.9
2	Dnipro	9.8
3	Kharkiv	6.2
4	Kyiv	5.5
5	Lviv	5.4
6	Donetsk	5.2
7	Odesa	5
8	Poltava	4.7
9	Zaporizhzhya	3.9
10	Vinnitsya	3.3
11	Cherkasy	2.6
12	Mykolayiv	2.3
13	Ivano-Frankivsk	2.2
14	Zhytomyr	2.1
15	Khmelnyskiy	2.1
16	Chernihiv	2
17	Volyn	1.9
18	Sumy	1.9
19	Kirovohrad	1.8
20	Rivne	1.7
21	Kherson	1.6
22	Zakarpattia	1.5
23	Ternopyl	1.4
24	Luhansk	1
25	Chernivtsi	1

Figure 2. Number of displaced persons by macro-regions of Ukraine, IOM, as of April 2022⁵⁰



The current legislation fails to specify the criteria for determining the functional category of Ukrainian territorial communities. However, this does indicate that the decision on the allocation of a category would be taken by the Special Commission established by the Ministry of Restoration. The Commission is to be comprised at 50% by members of Parliament which, according to Ukrainian experts, opens space for vested interests of MPs to have their respective constituencies be attributed better funding⁵¹. The Government Action Plan for 2023 aims to develop the Procedure for determining the "territories of recovery" as a function category in 2023⁵², but so far this has not been done.

Majority of infrastructure projects will happen at the local level with local governments responsible for their delivery and disposing very limited capabilities for project implementation.

Finally, based on the principle of subsidiarity, it is important that the obligation for development of the regional and territorial communities' planning documentation is matched with managing responsibilities of levels of government and is followed by adequate allocation of resources. In this regard, a pragmatic approach suggests **that planning**

of infrastructure of regional and national significance should be done at state and regional level, while the bulk of infrastructure to be delivered at the local level would be the responsibility of the local governments, i.e., territorial communities⁵³. However, this approach hits the limits of local governments' capabilities to deliver the required scope for planning documentation and relevant infrastructure projects. The local capabilities of local governments as essential elements for effective reconstruction and SI delivery are separately discussed in Section 2.4.

2.3. Developments in spatial planning affecting SI delivery

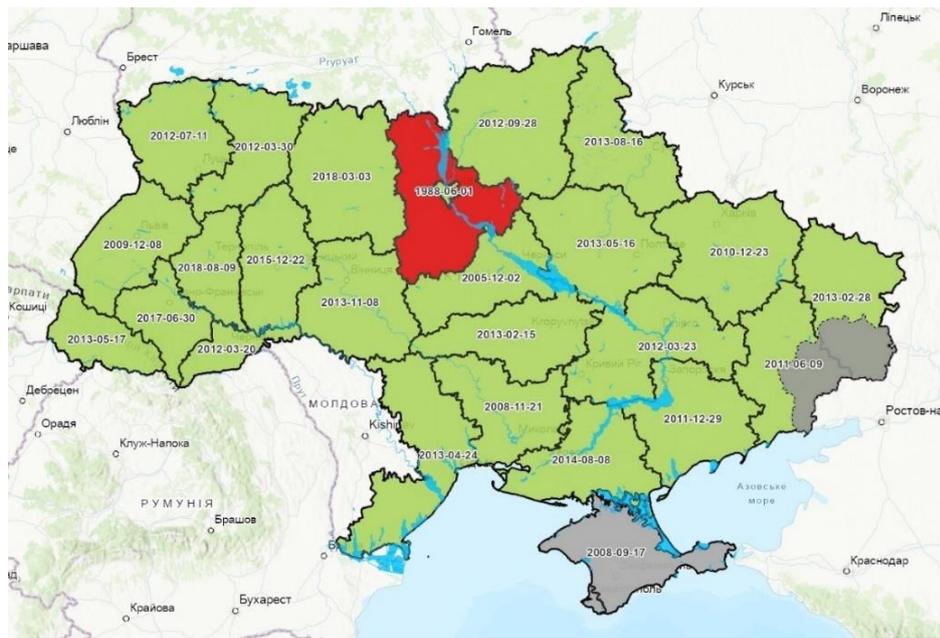
Spatial planning and urban development policies are closely related to infrastructure delivery. Infrastructure shapes the economic activity and social interactions of communities, defining how urban and rural settlements interact and develop. **Having a coherent and strategic approach to spatial planning of territories is an important foundation for delivering infrastructure that meets the needs of communities, creates value, and enhances**

quality of life. Spatial planning should be actively used as a tool to foster sustainable infrastructure delivery by integrating and promoting green and sustainable construction principles, efficient use of existing infrastructure, brownfield redevelopment approaches, and more inclusive and participatory approaches in decision-making on infrastructure projects. In addition, spatial planning should reflect and complement the national economic and regional development⁵⁴ objectives (e.g., decarbonisation, digitalisation, EU integration, etc.)⁵⁵.

Spatial planning should be actively used as a tool to foster sustainable infrastructure delivery by integrating and promoting green and sustainable construction principles, efficient use of existing infrastructure, and citizen-centred approaches of assets delivery.

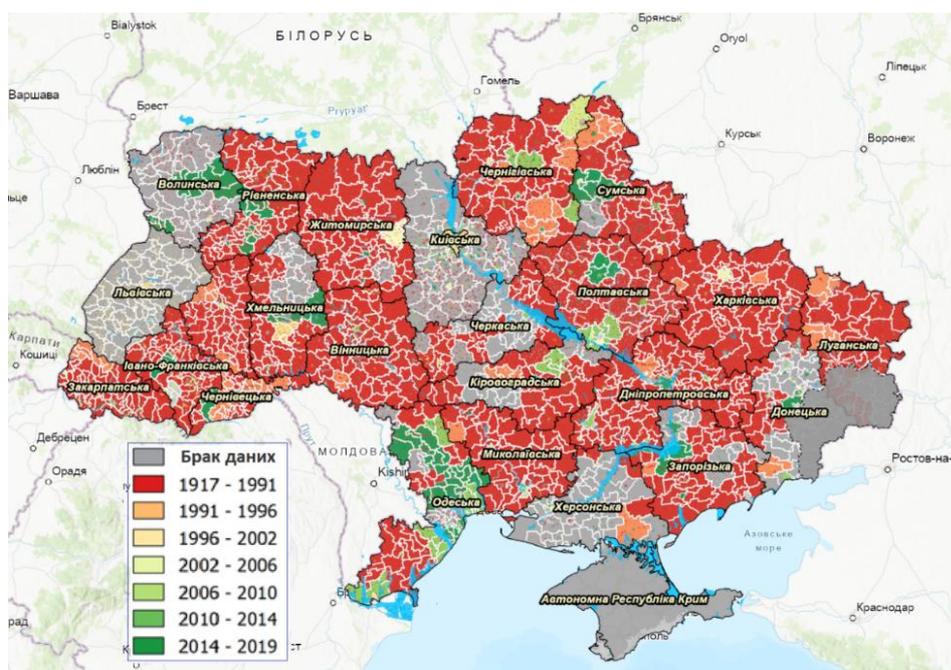
Ukraine has three levels of spatial planning, including national, regional, local (i.e., at the level of territorial communities)⁵⁶. In the context of decentralisation reform in place since 2015, Ukraine has been moving towards an integrated spatial planning approach away from a centralised approach inherited from the soviet times. However, **Ukraine's master plans have remained for the most part outdated, hindering efficient spatial development and, hence, the potential of sustainable infrastructure delivery.** For instance, the National General Master Plan was adopted in 2002 and has not been updated since⁵⁷. In addition, most regional spatial plans were updated in 2008-2014, with the exception of the Kyiv region, whose spatial plan dates back to 1988 (Figure 3).

Figure 3. Latest spatial planning documentation at regional level, (dates of adoption of plans)⁵⁸



At the territorial community level, spatial planning was introduced through legislation on comprehensive spatial plans which entered into force in 2021. It makes mandatory for territorial communities to develop and adopt comprehensive spatial plans by 2025⁵⁹. This law comes as the result of the recent completion of the amalgamation of territories into territorial communities as part of decentralisation reform. Most territorial communities are still in the process of developing their spatial plans, with current spatial planning at the local level drawing from the district level documentation, the majority dating from before 1991 or missing (Figure 4).

Figure 4 Spatial plans at the level of districts (in absence of plans at the level of territorial communities)⁶⁰ (Legend: dates of adoption of plans; grey – information is missing)



The comprehensive spatial plan of the territorial community includes both urban planning and land management documentation. The development of such a plan is costly and lengthy procedure (approx. 2 years for development and 1 year for public consultations and required administrative approvals) but a necessary one for local communities to benefit from state and donor funding and to effectively manage their territories⁶¹. **The introduction and further implementation of comprehensive territorial development plans is in line with the EU Cohesion Policy and will contribute to the EU integration efforts of Ukraine.** However, it is important to note the limited capacity of local governments to develop strategic policy documentation in the area of recovery and a comprehensive spatial development plan.

Furthermore, the effort to enhance spatial planning at the local level should be complemented by a robust national-level mechanism aimed at enhancing spatial and urban planning data availability. Most spatial data are not digitalised and are fragmented across different systems and registrars. Due to the war, updates on cartography for urban planning have not been made since 2022, and no spatial planning at the local level has been taking place. Hence, **there is an urgent need to create a single information system for urban planning at the state level to enhance the transparency and effectiveness of reconstruction activities, including infrastructure delivery.**

A single information system for urban planning at the state level is needed to enhance transparency and effectiveness of SI delivery.

The Government, with the support of donors, is planning to create the Geoinformation system Urban Planning Cadastre at the State Level. It will incorporate data from the unified digital topographic database, planning and cartographic database, state land cadastre, the General Scheme of Planning of the Territory of Ukraine, planning schemes of territorial communities, and the results of regional urban planning cadastres, urban planning documentation, legal and regulatory acts on urban planning, and other data of sectoral cadastres and related information systems. **The creation of a Geoinformation system of Urban Planning Cadastre at the State Level is crucial for the full automation of urban planning, yielding substantial benefits for infrastructure planning, effective project implementation, and infrastructure management.** The Geoinformation system of Urban Planning will also increase transparency and accountability of the spatial planning system and facilitate the integration of the place-sensitive approach to territorial development discussed below.

2.4. Capabilities of local governments and SI delivery

Local governments (i.e. territorial communities) are major actors in reconstruction efforts and, together with the support of the national government and international partners, will be delivering most of the infrastructure projects for reconstruction and recovery. The capacity of local governments to fulfil their mandates, especially in the light of increased responsibilities following the new legislation discussed in the previous sub-sections, is crucial for the success of reconstruction.

Local government capacities build on the achievements and shortcomings of decentralisation reform before 24 February 2022 and the impact of large-scale invasions on regions and municipalities. Among shortcomings of the reform process is the uneven development across regions and communities pre-2022 which is seen in large variations of fiscal, administrative and human-resource capacities⁶². For example, Table 3 demonstrates heavy disparity in terms of regions' contribution to national GDP, Kyiv City and Kyiv region contributing almost a third to national economy (29.4%), followed by Dnipro (9.8%) and Kharkiv (6.2%), with 15 out of 24 regions contributing less than 3%. The OECD analysis details that between 2010 and 2019, Ukrainian economy became increasingly dependent on the Kyiv agglomeration, with other regions lagging behind.

The place-sensitive approach to regional development support delivery of infrastructure as it allows the implementation of infrastructure projects that meet specific development opportunities of given territories, and encourages local initiatives, building local governments' capabilities in effective funds utilisation.

These regional disparities have been exacerbated by the war. Some regions and communities suffered significant destruction and damage of their infrastructure, coupled with population displacement and business relocation (north-east, south). Other territories struggled to accommodate the needs of the population that grew due to displacements (e.g. Lviv, Ivano-Frankivsk regions), in some places often while operating in the context of ongoing damages to critical infrastructure and housing (for example, Zaporizhzhia, Kherson, and

Kharkiv regions) (Figure 2).

The implementation of a place-sensitive approach to regional development can help address current regional imbalances as it relies on differentiation of territories based on their similarities and divergencies, integrated approach to development interventions (cross-sectoral) and coordination that combines both top-down and bottom-up approaches to regional projects and initiatives⁶³. It can help deliver better infrastructure that meets the specific needs and development opportunities of given territories, encourages local initiatives, and helps build local governments' capabilities in project implementation.

Implementation of this approach could start with softening a strong hierarchical approach to regional and local development planning⁶⁴ which is currently in place to encourage better motivation, creativity and quality of infrastructure at the local level. Furthermore, the central government can strengthen local capabilities through tailored support and advice regarding infrastructure planning and project implementation. For instance, the Restoration Agency which has a mandate to support and advise on infrastructure projects, among other things, and which has a regional presence, could take on this role. **Donors can also make a significant contribution in building the capabilities of local authorities in the area of development and appraisal of infrastructure projects (including economic, social, and environmental aspects), their implementation, and monitoring, bringing in relevant expertise and foreign knowledge.** Such initiatives are already taking place, for example, a project by the Ministry of Restoration and the USAID⁶⁵ which aims to build the capacities of 15 territorial communities in the Chernihiv and Sumy regions for reconstruction projects. This entails provision of consulting and advisory services to local authorities, along with training, webinars and exchange of practices and experiences, implementation of local initiatives⁶⁶.

The place-sensitive approach would also require that local governments' responsibilities match resources for their implementation, including when it comes to infrastructure delivery. In addition to local budget revenues, central government transfers, which are meagre due to difficult economic situations, and funds from the State Regional Development Fund, other sources of funding were made available to local governments to support the implementation of infrastructure projects (Box 1).

Box 1. Additional funding available to local governments to finance infrastructure projects in reconstruction and recovery context

- **Fund for Liquidation of Consequences of Armed Aggression**

The Fund recently allocated the first tranche of UAH 6.6 billion for implementation of 157 restoration projects in local communities⁶⁷. 56% of projects are concerned with social and critical infrastructure restoration (incl., water supply and drainage) with the rest covering capital repairs of apartment buildings.

- **Ukraine Development Fund**

The Government also recently announced the launch of the **Ukraine Development Fund** that will attract and mobilize public and private capital for reconstruction projects in key sectors, including energy, infrastructure, agriculture, manufacturing and IT.

- **Fund of Local Communities Restoration**

, the Ministry of Restoration, the Agency of Restoration and UN are planning to establish a **Fund of Local Communities Restoration** which is expected to mobilise USD 300 mn over the 5 year-period with starting funding of USD 50 mn. The Fund aims to dedicate its first tranche to pilot project to rebuild six settlements that suffered the most from Russian aggression: Trostyanets, Tsirkuny, Borodyanka, Moschun, Posad-Pokrovsky, and Yagidny⁶⁸.

- **Public-private partnership (PPP) contracts for infrastructure projects**

in case local authorities use a **public-private partnership (PPP) mechanism for infrastructure delivery**, the PPP Agency can provide support with elaboration of necessary tender documentation and engaging advisors for in-depth assistance with PPP project development and implementation. In fact, a mixed PPP model holds great potential for implementation of infrastructure projects by local governments⁶⁹.

3. Implementation of SI: sustainable construction practices

Reconstruction provides an opportunity to decarbonise construction sector and accelerate the implementation of European standards of energy efficiency in construction to support Ukraine's energy security and EU integration objectives.

Housing, social infrastructure, transport, and critical infrastructure (energy, water supply, heating, etc.) represent major infrastructure needs in the context of reconstruction with the total cost of damage to the housing sector estimated at over USD 50 billion, in transport sector – USD 35,7 billion, and damage estimated to power, gas, heating and coal mining infrastructure estimated at USD 10 billion⁷⁰. The construction sector is the obvious area requiring policy intervention to support the delivery of SI.

The Government of Ukraine addresses the urgent need of decarbonisation of construction sector and implementation of European standards of energy efficiency in construction in its draft programme for “Construction, urban planning, modernization of cities and regions”⁷¹. In fact, the programme intends to set the construction sector on a new path through changes to requirements in residential and non-residential building construction (e.g. housing, schools, hospitals, etc.) in line with the relevant EU standards.

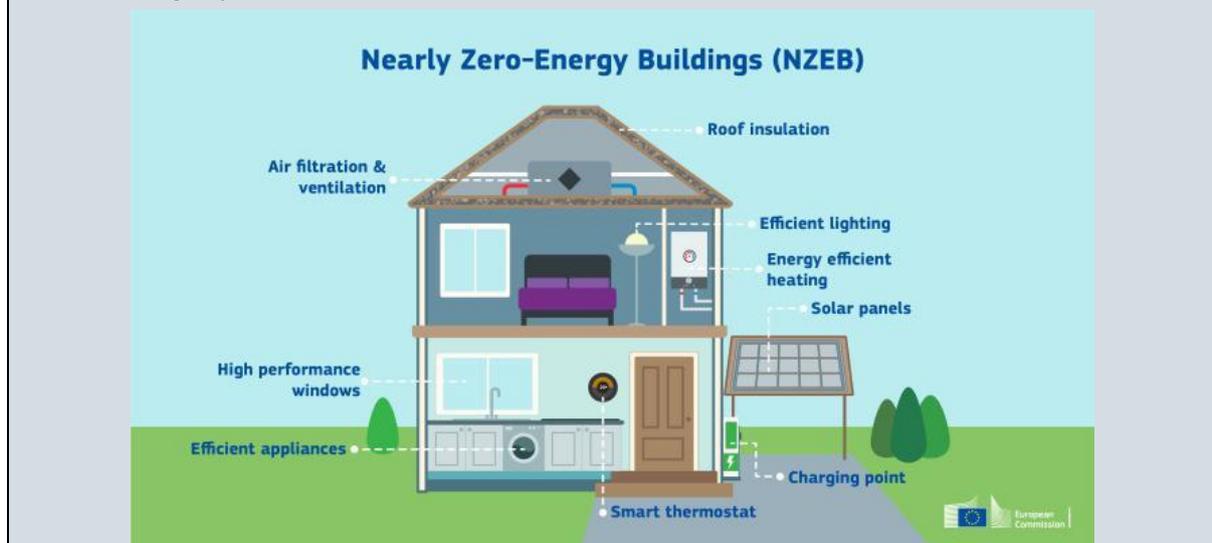
Thus, **the draft programme sets the target of increasing the energy efficiency of buildings by 13% by 2025, and aims for a 35% increase by 2031, through the introduction of near-zero-energy buildings (NZE), and later, zero-emissions buildings (ZEB).** NZE⁷² and ZEB are at the centre of the EU's energy efficiency and climate policies and are part of the Energy Performance of the Buildings Directive⁷³. For Ukraine, NZE and ZEB are part of the European integration requirements and contribute strongly to strengthening the country's energy security.

Box 2. Near zero-energy buildings and zero-emissions buildings as means to enhance energy efficiency and set the construction sector on decarbonisation path⁷⁴

The NZE is a building that has a very high energy performance, while the nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby⁷⁵. The mandatory compliance with the NZE for the construction of new public buildings is expected to be introduced

by end 2025, with a roll out of NZEB requirements for all new buildings by 2027. As of July 2022, while the Concept on the implementation of the energy efficiency through NZEB was approved, along with the national Plan to increase the number of NZEB, the implementation of the policy has not moved beyond setting the regulatory base.

A ZEB is a building with a very high energy performance, with the very low amount of energy still required fully covered by energy from renewable sources and without on-site carbon emissions from fossil fuels. The requirements for zero-emissions buildings (ZEB) are to be set out by 2028 with the pilot projects roll out by 2030. ZEB requirements to be made mandatory for new construction of all buildings by 2032.



To accompany the implementation of NZEB and ZEB, the draft programme also foresees the replacement of 22% of natural gas with renewable energy sources for heating individual houses and buildings by 2025, and eventually reaching 35% of natural gas replacement by renewable energy sources by 2032. This objective is commendable, but its implementation risks facing major challenges as the market for renewable energy in Ukraine is still underdeveloped and its further development is being hampered by the war. Fostering renewable energy development would require support from the government and guarantees from international partners, together with clear communication with citizens about the benefits and importance of moving away from a fossil-fuel-dependent economy.

While the described policy initiatives are commendable and provide a vision for Ukraine's housing and non-residential sector development in the decades to come, **action to decarbonise the construction sector can and should be taken from the beginning of reconstruction efforts and could be strengthened through implementation of new technologies and dedicated policy tools** (e.g. changes to procurement procedures to integrate environmental sustainability criteria). The following subsections provide some examples of sustainable construction practices that can be considered for SI in Ukraine.

3.1. Setting the construction sector on sustainability-focused development path

Construction sector in Ukraine is overregulated leaving room for many inefficiencies, such as higher costs of construction, monopoly and lack of competition, corruption practices, low innovativeness and productivity. If Ukraine is to build back better, it needs to use reconstruction as an opportunity to address these challenges (e.g. simplification of permit obtention, enhancing geospatial data availability, etc.). In addition, **reconstruction should serve to set the construction sector on a more sustainable path to ensure that it meets the decarbonisation objectives of the draft recovery programme.** The report by Cambridge Centre for Smart Infrastructure and Construction on delivering and managing infrastructure for 21 century⁷⁶ contains several recommendations that could be useful for the Government of Ukraine in its effort to deliver SI in reconstruction process. The selected recommendations are presented below, with relevant considerations for Ukraine:

Construction sector in Ukraine can benefit from review of design code to reduce waste, integration of life-cycle management approaches to infrastructure assets to enhance the quality and longevity of infrastructure, while mandatory carbon and environment assessment would support decarbonisation and energy-efficiency targets set for housing sector recovery.

1. **Design codes should be reviewed and revised to reduce conservatism and overuse of materials.** This is particularly relevant for Ukraine, with its over-regulated and outdated design and construction codes. Such revision can increase transparency, efficiency, and sustainability of the infrastructure delivery in Ukraine, making it also less wasteful.
2. **Incentives for lifecycle and risk-based management approaches to infrastructure assets need to be identified with proper risk allocation** (i.e. based on who is best able to manage them). The incentives can be embedded in procurement contracts followed by the adoption of appropriate monitoring mechanisms. A life-cycle management approach to infrastructure contributes to better-informed asset management decisions, including in the case of reduction of carbon emissions at asset operation and maintenance phases. The elaboration of state legislation in this area and the introduction of relevant incentives for the private sector could be the first step in this direction in Ukraine.
3. **An approach to the infrastructure project life cycle should not only focus on four traditional priorities (scope, cost, risk, and time) but also on four other priorities (biodiversity, social value, resilience, and carbon and environment)** in line with the EU Green Deal and UN SDGs. The integration of mandatory carbon and environmental assessment into project planning could be a powerful incentive to initiate these transformations in Ukraine.
4. **Value capture and asset recycling⁷⁷ should be promoted** for more sustainable use of available assets and to free up funding for new public infrastructure. This area is relatively new for Ukraine and could benefit from the support of international partners. It is of particular relevance for Ukraine given the very limited financial resources the Government has due to the war to finance its activities, including infrastructure projects.

Another means to set the construction sector in Ukraine on a more sustainable path is **the integration of innovative technologies that enhance the productivity of the sector and quality of infrastructure assets** (e.g. Building Information Modelling, BIM). Furthermore, effective management of the building during its lifecycle, through Life Cycle Cost Analysis, could add substantially to the sustainability of infrastructure.

The current draft programme of Ukrainian Government foresees the implementation of life cycle cost analysis of buildings, and the adoption of the Action Plan for the Concept ‘For Introducing BIM in Ukraine’, coupled with harmonisation of conformity assessment system for construction sector with the EU requirements.

3.2. Building Information Modelling (BIM) systems for SI

Building Information Modelling is an intelligent software modelling process in 3D that architects, engineers, and contractors can use to collaborate on a building’s design, construction, and operation. **Its ability to seamlessly facilitate collaboration between all actors involved in the construction process allows for better design coordination, asset management, and maintenance planning.** In addition, BIM is capable to integrate latest technology advances in the area of Artificial Intelligence (AI), Internet of Things (IoT), and Augmented Reality (AR)⁷⁸ which is likely to enhance its performance and benefits. Finally, BIM can be instrumental in facilitating the integration of lifecycle analysis of buildings and efficient and green energy designs⁷⁹.

BIM is an intelligent software modelling process in 3D that architects, engineers, and contractors can use to collaborate on a building’s design, construction, and operation.

The construction sector in Ukraine is characterised by outdated technology, process management tools, and data gaps throughout different stages of the construction process. Research in this area shows that the use of BIM can increase the transparency of investment and construction processes, enhance the predictability of outcomes, and foster improvements in existing regulatory procedures, legal bases, and the nature of contractual agreements.⁸⁰ BIM enables standardisation and uniformity of digital processes and helps to set the level playing field in the construction sector, simplifying the entry of small and medium-sized enterprises into the market. **It can also facilitate and increase investments in construction sector, improve efficiency of construction processes, create more transparent and coherent data exchange mechanisms, and enhance digital governance throughout the life cycle of the asset**⁸¹. These represent significant benefits for Ukraine’s construction sector, especially under the current circumstances of war.

Moreover, the BIM can not only help to decrease construction costs, reducing waste of time and resources, but can also ensure buildings meet carbon-reduction and energy-efficiency requirements.

BIM can increase the transparency of investment and construction processes, enhance predictability of outcomes and foster improvement of regulatory procedures and level playing field in the construction sector.

Finally, BIM can optimise costs and allocate sufficient resources for later stages of the asset life cycle, that is, operation and maintenance, as it frees up sufficient resources. This makes a substantial contribution to delivering sustainable infrastructure in Ukraine from the point of view of infrastructure performance over time. The practice shows that companies are proven to dedicate significant resources to the design and construction of the building, but much less, or very marginal resources to the operation and maintenance of the asset. This goes against

the respect of the asset life cycle and results in inefficiencies down the road (e.g. costs for maintenance, difficulty in fixing problems with the building, and low quality of services provided). **If Ukraine is to deploy NZEB and ZEB, the design, construction, and operation of such buildings would need to integrate technology for data gathering and sharing and a different approach to building maintenance, which makes a strong case for BIM introduction.**

Reconstruction presents excellent grounds for the introduction of BIM in Ukraine to ensure higher productivity of the construction sector and quality of infrastructure. The concept note⁸² on the introduction of BIM in Ukraine's suggests that **policymakers could envisage voluntary BIM application at a basic level (2D/3D CAD)⁸³, at first, promoting its adoption through dedicated capacity-building support and potentially some financial incentives.** A few pilot projects with support from international professionals with experience in BIM can lead the way and start shaping the trends in the construction market in Ukraine. The next stage of BIM implementation in Ukraine could be the mandatory integration of BIM technology in projects where the state is investing/buying above a certain threshold; such a practice is common in some EU countries.

The Ukrainian draft program sees the implementation of pilot construction projects with the use of BIM technologies in 2032. This means that there is enough time

The introduction of BIM in Ukraine is not expected until 2032 which makes it important, also from the EU integration perspective, to find other mechanisms to repair but also construct, and maintain new buildings in a sustainable way.

to gradually build up the capacities of construction sector professionals to use BIM effectively. However, this also means that many construction projects would be completed without the efficiencies of BIM technology (economic, social, and environmental). In this context, it would be important, also from the EU integration perspective, for the Government of Ukraine to put in place other mechanisms to ensure that repairs of damaged housing and other social infrastructure, as well as design and construction of new buildings, is a way that respects the infrastructure life-cycle and environmental sustainability.

4. Implementation of SI: engaging local communities in infrastructure decisions

Empowering local governments and communities, developing their sense of ownership and engagement in reconstruction of their territories can be a powerful driver of Ukraine's sustainable and resilient short-term recovery and long-term development. Lessons in post-disaster reconstruction in democratic context show that **community engagement in decision making for recovery can help to deliver better value of infrastructure, enhance trust in local government, contribute to social cohesion, and bring political benefits (re-election, etc.)⁸⁴.** Trust and social cohesion are critically important for the effective functioning of a democratic society, but even more so in the context of war or military aggression. Building and maintaining trust with citizens is a task of national security significance for Ukraine, with reconstruction playing a key role in building this relationship, as the process is often perceived by people as the demonstration of how much their government cares for them and how effectively it is able to meet their needs.

In Ukraine, a recent poll shows that around 62% of the population trusted their heads of local government and 56% trusted their town and village councils.⁸⁵ It is also notable, that **36% of the population in Ukraine assesses the performance of the Government in reconstruction and recovery so far as very unsatisfactory⁸⁶.** This makes a strong case for Ukraine to enhance its engagement with citizens and involve them more in decision-making on reconstruction, both at the national and local levels.

Engaging citizens in decisions on infrastructure would enhance trust in local government, develop a sense of ownership and contribute to social cohesion, ensure that infrastructure is socially sustainable.

Furthermore, a **direct engagement of citizens in decision making on infrastructure contributes to social sustainability of such infrastructure**, i.e., ensuring that infrastructure has a “direct, positive impacts for people and communities that can be created by going beyond ‘fit for purpose’ built environment design and creating socially sensitive infrastructure or architecture”⁸⁷. **Bypassing**

Bypassing citizens when making decisions about infrastructure recovery will contribute to erosion of trust in public authorities in Ukraine, undermine social cohesion, and reinforce the thinking that private interests rather than public interest are driving the decision-making process.

Ukrainian citizens on reconstruction decisions would contribute to erosion of trust in public authorities, undermine social cohesion, and reinforce the thinking that private interests rather than public interest is driving the decision-making process. Erosion of trust in institutions is a dangerous slope not only for the effectiveness of reform and reconstruction delivery, but also in terms of national security considerations, providing fertile ground for misinformation and manipulation by Russia. It is also dangerous for Ukraine’s development given the country’s history of corruption which has worked against its citizens and public interests.

The following sub-sections contain ideas as to how to engage the population in their local government’s decisions on infrastructure for recovery and how to ensure that citizens have a say in decisions on the design of infrastructure assets.

4.1. Engaging citizens in decisions on infrastructure for recovery at the local level

The decision-making in a post-disaster or a post-war context is characterised by tension between the desire to rebuild quickly and a desire to have a more deliberative process to consider alternatives for recovery that incorporate both present and future needs of the population⁸⁸. The engagement of citizens can also be difficult if local authorities have no prior experience in this area and lack tools for engagement and trust between citizens and local authorities.

The pre-war context in Ukraine suggests around 40% of municipalities did not consider they had the necessary expertise to involve the private sector and individual citizens in the design and implementation of development plans and local initiatives⁸⁹. Exploring ways in which citizens can be meaningfully engaged in decision-making around infrastructure in their community and building the capacities of local governments to pursue such engagement would be necessary to ensure social inclusion and sustainability.

Exploring ways in which citizens can be meaningfully engaged in the decision-making around infrastructure in their community and building the capacities of local governments to pursue such engagement would be necessary to ensure social inclusion and sustainability.

The International Association of Public Participation (IAP2) has developed a spectrum for public participation (Figure 5) that can be of high relevance in the Ukrainian context. The spectrum was used to analyse citizens’ engagement in the reconstruction of Christchurch, New Zealand, in the aftermath of the 2011 earthquake. The analysis bears insights for Ukraine’s post-war reconstruction⁹⁰.

Figure 5. The IAP 2 Participation Matrix⁹¹

		INCREASING IMPACT ON THE DECISION 				
		INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL		To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
	PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

The Spectrum suggests four forms of engagement with the public in decision-making.

- **Informing** is a useful instrument to ensure that the public is aware of and understands the decisions made on its behalf. It is an essential part of the government’s transparency and accountability. In essence, the information campaign places the local agency in the position of honest broker, providing information that citizens need to understand the project and related decisions. *Informing can be a very useful mechanism to get public on board at earlier stages of recovery, for the work to actually start.* Further into the project, more consultation may be required regarding specific elements.
- **Consulting** the public can be regarded as the basic minimum for public input into decision-making⁹² and is about obtaining feedback on plans, solutions and ideas. *Consulting implies, however, very limited interaction with the public and is essentially a one-way communication.* Some examples of this type of engagement include public comments, focus groups, surveys, and public meetings. The decision on the issue is made by the public authority but draws on feedback provided by the community through the consultation process.
- **Involving** is about working directly with the public to ensure that needs and aspirations are consistently understood and considered when making decisions. Dedicated workshops or deliberative polling could be a means for implementation here. *Alternatives integrating public input are elaborated, and the public is informed on how its concern influenced the solutions adopted.*
- **Collaboration and empowerment** are at the highest end of the participation spectrum. They take more complex forms of public participation in decision-making, such as citizen advisory committees, consensus-building, participatory decision-making, citizen juries, ballots, delegated decisions, etc. *The collaborative approach foresees partnering with public at each aspect of the decision including the development of alternatives and the identification of the preferred solution*⁹³. The goal of an empowering process is to “place final decision making in the hands of the public”⁹⁴.

- Both of these processes can become risky, confrontational, and involve significant planning and preparation, hence, time and resources. If managed properly, they can be instrumental in forging public trust in public authorities and drive participatory democracy. However, *they also entail significant risks of failure and delay in decision making, and can be a source of frustration and feeling of lacking leadership from the public agency.* Hence, for conveying authority, it is important to engage in these approaches with integrity, openness, leadership, and strategic vision.

It is possible to use different types of engagement depending on type of infrastructure or decision at stake and taking into account the stage the project is at. For example, consistently informing the community about the decisions taken and consulting citizens on specific elements of the project that have a large and very direct impact on the life of the community (e.g. where the hospital should be built and how the city centre should look like). It would also be important to ensure that if the engagement process takes place, it delivers concrete results and is not used for ticking the box without actually considering public opinion and feedback for decision-making.

Reconstruction opens opportunities to enhance relations between local authorities and the population, increase transparency and build trust, as well as foster a pro-active civic position of Ukrainian population through regular participation in relevant decision making – an essential element of democracy.

The Government of Ukraine could consider setting up a framework to incentivise local authorities to engage citizens in various forms, as outlined by the IAP2 spectrum. A short guidance can be elaborated to help identify which type of engagement would be the most relevant depending on the issue at stake and specific context (e.g. for construction of new school – public consultation, for amending the roads – informing the public, etc.). This guidance can help local authorities meaningfully and regularly engage with their citizens. Controversial and complex issues may require tools on the higher end of the spectrum, whereas in areas with public consensus and little controversy, the lower end of the spectrum can be useful.

It is also important to consider citizens' expectations when it comes to their engagement in the recovery process. In the case of Christchurch, residents had expectations to be involved more in decision-making, especially decisions affecting their private property, and when the government bypassed engagement processes, this resulted in citizen contestation. **In the case of Ukraine, citizens are expecting the government to involve them into the process of decision making on reconstruction,** as recent outcries among civil society and broader population on local government's expensive infrastructure recovery initiatives show⁹⁵.

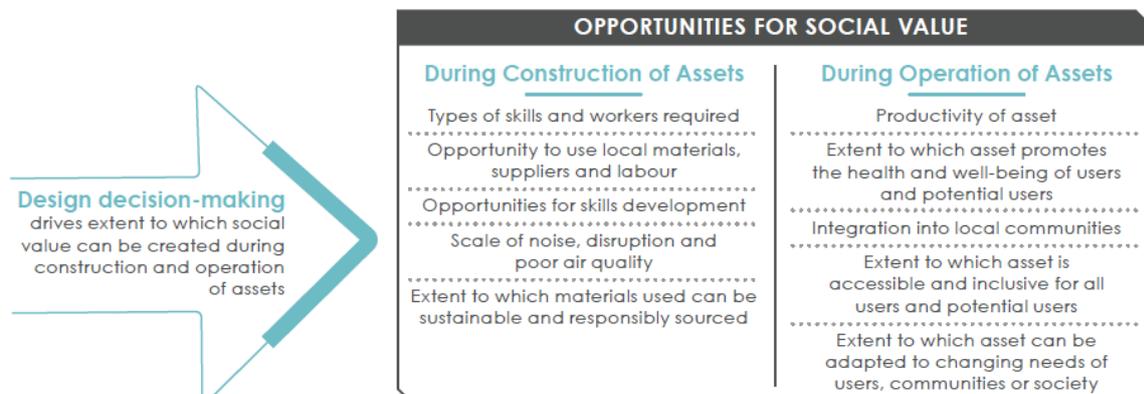
The time and financial pressures make public engagement in reconstruction decisions a relatively difficult undertaking, but the benefits of undertaking it are substantial not only from the short-term (i.e. better quality infrastructure that meets the needs of the citizens, longer life span of assets) but also from the longer-term perspectives (e.g. enhanced trust in institutions, increased social cohesion, and sense of ownership of reconstruction efforts among citizens). Reconstruction opens opportunities to enhance relations between local authorities and the population, increase transparency, and build trust, as well as foster a pro-active civic position of Ukrainian population through regular participation in relevant decision making – an essential element of democracy.

4.2. Engaging communities into decisions on design of infrastructure: contributing to social sustainability

Social sustainability, also called social value, of infrastructure can and should be created during the design, construction, and operation of infrastructure assets.

Social sustainability, also called social value, is an important component of infrastructure sustainability, as mentioned in the introductory section of this report. Social value can and should be intentionally created during the design, construction, and operation of infrastructure assets⁹⁶. **The design stage is of particular importance for enabling the social sustainability of infrastructure, as it has a direct influence on social value generation at the construction and asset operation stages (Figure 6).**

Figure 6. Opportunities for social value at construction and asset use influenced by design decisions⁹⁷



Hence, **one of the powerful ways of making infrastructure socially sustainable is the integration of people's views into decision making on the design of infrastructure assets.** Such engagement of the community provides a sense of ownership and involvement, connecting people with places and making them feel valued⁹⁸. Infrastructure designed in such a way supports social cohesion, promotes the health and wellbeing of users, and enhances the long-term value of the asset, as people value and want to spend time in these places⁹⁹.

In the UK, Government and built environment stakeholders (architects, construction companies, etc.) have been increasingly looking at infrastructure as a means to contribute to their levelling up agenda and deliver additional social value for communities and economy as a whole. **The approach aimed at ensuring that infrastructure delivers social value and sustainability can be of great use for the reconstruction of Ukraine.**

Integrating people's views into decisions on design of infrastructure assets could take form of a survey or a consultation with residents (e.g., representatives of association of owners) and local stakeholders, on their needs and vision for the living space, followed by feedback on design solutions proposed by the constructor.

Given the substantial scope for the construction of new buildings in cities and villages that suffered severely from the war (up to 90% of housing and social infrastructure severely damaged or destroyed), ensuring that the infrastructure responds to people's needs and is able to generate health, welfare, and social cohesion benefits would be crucial in Ukraine.

Integrating people’s views into decisions on design of infrastructure assets could take form of a survey of end users’ preferences and vision for living space, or a consultation with residents (e.g., representatives of association of owners) and local stakeholders on their needs and vision, followed by feedback on potential design solutions proposed by the constructor. Given the growing number of people with disabilities due to the war (e.g. between 20,000 and 50,000 Ukrainians have lost one or more limbs since the start of the war, a number close to WWI statistic on amputations)¹⁰⁰, single parent-families, and people over the age of 60 that are alone, it would be important to integrate their

At the design stage, the constructor should understand user expectations, local social needs and how these can be addressed through the infrastructure asset in close coordination with the local government and end users.

views on the design of housing to ensure that it meets their needs and ensures quality living. There are numerous examples of initiatives in this regard. For instance, in the UK, the Castlemaine Court in Surrey was built in line with inter-generational living in mind. The design of the residential building allows single people, couples and families to be housed within one community, with positive effect for social cohesion and social integration and with direct involvement of people-end users in the planning process¹⁰¹.

Such participatory approach for delivery of infrastructure to meet social sustainability objectives requires specification by local governments of these objectives in tender documentation, and implementation of these social sustainability criteria by construction companies in charge of the project. For example, at the design stage, the constructor should take time to identify local social needs and understand user expectations and how these can be addressed through the infrastructure asset in close coordination with the local government and end users. Furthermore, the constructor needs to integrate social value into project processes and requirements at later stages.

Certainly, implementation of a social-sustainability approach to infrastructure delivery in Ukraine requires relevant regulatory framework and capable and incentivised construction sector.

Building the capabilities of the construction sector in Ukraine to deliver a more people-centred infrastructure could greatly benefit from international expertise and knowledge spillovers, such as, for example, from architects and construction companies in the UK and Australia, delivering infrastructure in line with Lifetime Homes standards¹⁰². The Lifetime Homes standard adopted in the UK is of particular relevance for Ukraine, as it promotes accessible and adaptable accommodation for everyone, including individuals with temporary or permanent physical impairment, a population that is growing in Ukraine.

Building the capabilities of construction sector in Ukraine in delivering socially sustainable infrastructure can greatly benefit from international experience and knowledge spillovers, e.g., from the UK and Australia.

Policy recommendations

The below table (Table 4) summarises the main challenges and opportunities across the discussed policy areas (i.e. reconstruction, regional development, and spatial planning policies), as well as in selected environmental and social sustainability aspects of infrastructure delivery covered by this report (i.e. decarbonisation of the construction sector and citizens’ engagement in decisions on infrastructure). It also provides policy recommendations that address the identified issues and aim to deliver sustainable infrastructure for Ukraine’s reconstruction and recovery.

Table 4. Conclusions and Policy Recommendations.

	Reconstruction and recovery policy	Regional Development Policy	Spatial Planning Policy	Environmental sustainability of infrastructure: decarbonising construction sector	Social sustainability of infrastructure: citizens' engagement in decision-making
Challenges	Lack of focus on sustainability overall and in case of infrastructure (i.e., lack of integration of social and environment sustainability considerations); Lack of concrete mechanisms for implementation and monitoring of set objectives; Highly declarative nature of draft action plans.	Overlap and duplication between strategic documents; Functional specification of territories potentially reinforcing uneven regional development and exacerbating inequalities with missing role of sustainability in driving harmonious regional development.	Outdated spatial planning at local level creating room for inefficiencies for delivering infrastructure planning; Fragmented data on spatial planning, its insufficient digitisation (e.g., different registrars and archives not linked to each other and not fully digitised) and availability;	Overregulated, suffering from low innovativeness, productivity, competitiveness, and high carbon intensity; Recovery programme having no mechanisms to ensure decarbonisation in the short term;	Lack of strategic approach to citizens' engagement in decisions on infrastructure as a means of creating social value. Lack of capacities of local governments to meaningfully engage with citizens.
	Weak local governments' capacities to deliver SI, incl. at the level of regional and spatial planning and infrastructure projects implementation				
Opportunities	The priority objective of EU integration and subsequent harmonisation of legislation as a driver for delivery of sustainable infrastructure (e.g., alignment with EU Green Deal).	Introduction of three-level regional development plans and functional types of territories for recovery providing clarity on mandates and development opportunities for local governments;	Introduction of comprehensive spatial plans of territorial communities and plans providing clarity on possible infrastructure delivery; Creation of a single spatial planning database, a Geoinformation system of Urban Planning Cadaster at the State Level.	Recognition of the need of urgent sector decarbonisation; Transition to near-zero energy and zero-emissions buildings envisaged, together with a deployment of Building Information Modelling (BIM) in later stages of reconstruction;	International practice in construction sector (e.g., Lifetime Home Standard, UK); Willingness of citizens to be involved in the decisions on infrastructure in the context of recovery
Recommendations	Adopt a strategic vision of sustainable infrastructure and its role in delivering on Ukraine's resilient recovery and EU integration objectives (incl. compliance with EU Green Deal).	Integrate two planning documents envisaged under two separate legislations into one to avoid duplication of efforts and waste of resources at the local level.	To address spatial planning data gaps and fragmentation and introduce a single information system for urban planning at the state level to enhance the transparency and	Promote decarbonisation of construction sector through introduction of new policy tools that target environmental sustainability, such as, for example, revision	Ensure citizens' engagement in decision-making on infrastructure delivery through adaptation of the International Association of Public Participation (IAP2)

	<p>Clearly prioritise sustainability of infrastructure in draft recovery programmes directly concerned with infrastructure and include concrete mechanisms for implementation, monitoring, and evaluation of measures to ensure SI delivery in the reconstruction process.</p>	<p>Ensure that sustainability is a priority for all four functional types of territories for recovery introduced by recent legislation on regional development to avoid locking sustainability within only one type of territory, i.e., “territories of sustainable development”, and contribute to aggravating regional disparities exacerbated by the war.</p>	<p>effectiveness of infrastructure delivery.</p>	<p>of design codes to reduce waste and mandatory carbon and environment assessments for infrastructure projects at procurement and asset design stages.</p> <p>Roll out the Building Information Modelling (BIM) technology in Ukraine first as a pilot project based on with voluntary BIM application at a basic level (2D/3D CAD) and gradually making BIM mandatory for projects where state is the investing above a certain threshold, in line with European practice.</p>	<p>spectrum for public participation (i.e. inform, consult, engage, empower) to enhance trust between citizens and public authorities and develop a better sense of ownership and involvement in reconstruction.</p> <p>Engage citizens in decisions on the design of infrastructure through surveys, consultations, or other methods to ensure that infrastructure creates social value throughout its life cycle, promotes health and well-being, and enhances social cohesion.</p>
	<p>Build the capabilities of local governments to deliver SI through dedicated training, knowledge, and experience sharing, with engagement of donors and international partners and central government initiatives aimed at supporting infrastructure planning and implementation (e.g. regional offices of Restoration Agency).</p> <p>Implement a place-sensitive approach to regional development to address current regional imbalances and facilitate the delivery of infrastructure that meets the specific needs and development opportunities of given territories.</p>				

References

Cover image source: <https://www.hhs.se/en/about-us/news/site-publications/2023/how-should-the-reconstruction-of-ukraine-be-financed-and-organized/>

¹ Global Infrastructure Hub. 'Sustainable Infrastructure'. Accessed 22 July 2023.

<https://www.gihub.org/sustainable-infrastructure/>.

² Yanamandra, S., (2020) *Sustainable Infrastructure: An Overview Placing infrastructure in the context of sustainable development*. University of Cambridge Institute for Sustainability Leadership. Available at [sustainable-infrastructure-an-overview.pdf \(cam.ac.uk\)](https://www.cisl.cam.ac.uk/publications/sustainable-infrastructure-an-overview.pdf)

³ United Nations. 'Sustainability'. United Nations. Accessed 17 August 2023. <https://www.un.org/en/academic-impact/sustainability>.

⁴ Cambridge Dictionary. 'Sustainability', 16 August 2023.

<https://dictionary.cambridge.org/dictionary/english/sustainability>.

⁵ UKGBC. 'Health, Wellbeing and Social Value'. Accessed 22 July 2023. <https://ukgbc.org/our-work/health-wellbeing-social-value/>.

⁶ For the purposes of this paper, energy infrastructure is not covered by the analysis.

⁷ G20/GI Hub, "Framework on How to Best Leverage Private Sector Participation to Scale Up Sustainable Infrastructure Investment", October 2022. Accessed 15 July 2023.

<https://cdn.gihub.org/umbraco/media/4832/g20-gi-hub-framework-to-scale-up-investment-in-sustainable-infrastructure.pdf>

⁸ Ibid.

⁹ World Bank; Government of Ukraine; European Union; United Nations.

Ukraine Rapid Damage and Needs Assessment : February 2022 - February 2023 (English). Washington, D.C. : World Bank

Group. <http://documents.worldbank.org/curated/en/099184503212328877/P1801740d1177f03c0ab180057556615497>.

¹⁰ Berlin Economics, *Economic reasons for a green reconstruction programme for Ukraine*, Berlin, April 2022. Accessed 12 July 2023. https://www.lowcarbonukraine.com/wp-content/uploads/PB_03_2022_en_Green-reconstruction.pdf

¹¹ Interfax. 'Ukraine Looks to Become European Energy Hub with Nearly \$400 Bln Investment - Energy Minister'. Accessed 17 August 2023. <https://interfax.com/newsroom/top-stories/91731/>.

¹² Social Value and design of the built environment, Supply Chain Sustainability School.

¹³ Government of Ukraine, National Recovery Council, 'Ukraine's National Recovery Plan', July 2022, Accessed 18 July 2023. https://global-uploads.webflow.com/621f88db25fbf24758792dd8/62c166751fcf41105380a733_NRC%20Ukraine%27s%20Recovery%20Plan%20blueprint_ENG.pdf

¹⁴ European Commission - European Commission. 'Questions and Answers – A New Ukraine Facility'. Accessed 17 August 2023. <https://ec.europa.eu/commission/presscorner/home/en>.

¹⁵ <https://www.worldbank.org/en/news/press-release/2023/06/21/world-bank-and-donors-provide-additional-1-75-billion-for-ukraine-in-support-of-relief-and-recovery-efforts>

¹⁶ Bandura, Romina, Janina Staguhn, and Benjamin Jensen. 'Modernizing Ukraine's Transport and Logistics Infrastructure', 20 October 2022. <https://www.csis.org/analysis/modernizing-ukraines-transport-and-logistics-infrastructure>.

¹⁷ Ibid.

¹⁸ Ibid. p 55

¹⁹ The practice of implementation of projects through off-budget assistance (rather than on-budget which was managed by Afghan Government) became recurrent due to lack of implementation capacities of Afghan Government and high corruption. It exacerbated the problem of sustainability, as US officials did not trust the Afghan officials with the funds and hence, were depriving them of opportunity to develop necessary capacities to manage those funds, all requiring more time than what the US development officials could afford due to political pressures to show progress.

²⁰ SIGAR. 'What We Need to Learn: Lessons from Twenty Years of Afghanistan Reconstruction', August 2021. <https://www.sigar.mil/pdf/lessonslearned/SIGAR-21-46-LL.pdf#page=54>.

²¹ Ministry of Finance of Ukraine. "'Priorities of rapid recovery - creation of conditions for economic development and return of Ukrainians", - Serhiy Marchenko during the conference on recovery of UR'. Press Corner. Accessed 17 August 2023.

https://www.mof.gov.ua/uk/news/priorities_for_rapid_recovery_are_to_create_conditions_for_economic_development_and_the_return_of_ukrainians_-_sergii_marchenko_at_the_ukraine_recovery_conference-4067.

²² CSIC and CPIP. 'The Role of Funding Financing, and Emerging Technologies in Delivering and Managing Infrastructure for 21st Century'. Text. New York, 2022. <https://www-smartinfrastucture.eng.cam.ac.uk/news/report-epsrc-nsf-infrastructure-workshop-new-york-2022-now-published>.

²³ Government of Ukraine. National Recovery Council. 'Draft Plan of the Working Group of NRC on Construction, urban planning, modernization of cities and regions', July 2022. Accessed 25 June 2023. <https://www.kmu.gov.ua/storage/app/sites/1/recoveryrada/eng/construction-urban-planning-modernization-of-cities-and-regions-eng.pdf>

²⁴ The theory of path dependence in political science suggests that past choices and practices create preferences for their continuation, creating resistance to change.

²⁵ Saha, David, Pavel Bilek, Rouven Stubbe, and Manuel von Mettenheim. 'Economic Reasons for a Green Reconstruction Programme for Ukraine'. Vox Ukraine, 8 June 2022. <https://voxukraine.org/en/economic-reasons-for-a-green-reconstruction-programme-for-ukraine>.

²⁶ Sustersic, Janez. 'Coordination of Reconstruction and Recovery with the Regional Development Policy in Ukraine'. U-LEAD with Europe, May 2023. <https://u-lead.org.ua/storage/admin/files/3d2f6c654ea3384ca017ca6848ea59ef.pdf> .

²⁷ Government of Ukraine. National Recovery Council. 'Draft Plan of the Working Group of NRC on Construction, urban planning, modernization of cities and regions', July 2022. Accessed 25 June 2023. <https://www.kmu.gov.ua/storage/app/sites/1/recoveryrada/eng/construction-urban-planning-modernization-of-cities-and-regions-eng.pdf>

²⁸ Government of Ukraine. National Recovery Council. 'Draft Plan of the Working Group of NRC on Recovery and development of infrastructure', July 2022. Accessed 25 June 2023. <https://www.kmu.gov.ua/storage/app/sites/1/recoveryrada/eng/recovery-and-development-of-infrastructure-eng.pdf>

²⁹ 'Ukraine Recovery Conference 2022'. Accessed 22 August 2023. <https://www.urc-international.com/urc-2022>.

³⁰ Sustersic, Janez. 'Coordination of Reconstruction and Recovery with the Regional Development Policy in Ukraine'. U-LEAD with Europe, May 2023. <https://u-lead.org.ua/storage/admin/files/3d2f6c654ea3384ca017ca6848ea59ef.pdf>

³¹ Milani, Luca, Nicola Sandri, and Detlev Mohr. 'Transforming Transport Infrastructure for Greater Sustainability | McKinsey'. McKinsey and Company, 1 October 2021. <https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/built-to-last-making-sustainability-a-priority-in-transport-infrastructure>.

³² Government of Ukraine. National Recovery Council. 'Draft Plan of the Working Group of NRC on Construction, urban planning, modernization of cities and regions', July 2022. Accessed 25 June 2023. <https://www.kmu.gov.ua/storage/app/sites/1/recoveryrada/eng/construction-urban-planning-modernization-of-cities-and-regions-eng.pdf>

³³ Ibid.

³⁴ Government of Ukraine. National Recovery Council. 'Draft Plan of the Working Group of NRC on Environmental Safety', July 2022. Accessed 25 June 2023. <https://www.kmu.gov.ua/storage/app/sites/1/recoveryrada/eng/ecosafety-eng.pdf>

³⁵ DixiGroup. 'Position Paper on Draft Recovery Plan of Ukraine', 9 September 2022. <https://dixigroup.org/en/analytic/position-paper-on-the-draft-recovery-plan-currently-the-document-does-not-look-like-the-ukrainian-green-deal/>.

³⁶ Ibid.

³⁷ 'EU Green Deal – Construction Products Europe'. Accessed 22 August 2023. <https://www.construction-products.eu/publications/green-deal/>.

³⁸ Ibid.

³⁹ Government of Ukraine, Draft sectoral programmes for recovery by the National Recovery Council (2022). Available at <https://www.kmu.gov.ua/diyalnist/nacionalna-rada-z-vidnovlennya-ukrayini-vid-naslidkiv-vijni/robochi-grupi>

⁴⁰ Parliament of Ukraine. 'Law on State Regional Policy', 21 July 2023. <https://zakon.rada.gov.ua/go/156-19> .

⁴¹ Sustersic, Janez. 'Coordination of Reconstruction and Recovery with the Regional Development Policy in Ukraine'. U-LEAD with Europe, May 2023. <https://u-lead.org.ua/storage/admin/files/3d2f6c654ea3384ca017ca6848ea59ef.pdf> .

⁴² The term “restoration” is used by the Government of Ukraine to refer to reconstruction phase in the short to medium term; the terms recovery and modernisation are used to refer to the longer-term reconstruction efforts that would imply structural changes in the economy.

⁴³ Sustersic, Janez. ‘Coordination of Reconstruction and Recovery with the Regional Development Policy in Ukraine’. U-LEAD with Europe, May 2023. <https://u-lead.org.ua/storage/admin/files/3d2f6c654ea3384ca017ca6848ea59ef.pdf> .

⁴⁴ Parliament of Ukraine . ‘On the introduction of changes to some laws of Ukraine regarding the priority measures of reforming the sphere of urban planning activities’, 12 May 2022. <https://zakon.rada.gov.ua/go/2254-20> .

⁴⁵ Sustersic, Janez. ‘Coordination of Reconstruction and Recovery with the Regional Development Policy in Ukraine’. U-LEAD with Europe, May 2023. <https://u-lead.org.ua/storage/admin/files/3d2f6c654ea3384ca017ca6848ea59ef.pdf> .

⁴⁶ Territorial communities are the 1-tier units of territorial and administrative division in Ukraine, are result of the decentralisation reform that allowed for merger of over 10 000 small and dispersed local entities into 1 470 larger municipalities (‘hromadas’) with increased administrative and economic capacity to manage their responsibilities.

⁴⁷ Sustersic, Janez. ‘Coordination of Reconstruction and Recovery with the Regional Development Policy in Ukraine’. U-LEAD with Europe, May 2023. <https://u-lead.org.ua/storage/admin/files/3d2f6c654ea3384ca017ca6848ea59ef.pdf> .

⁴⁸ Ibid.

⁴⁹ Data from National Statistics Service of Ukraine, 2019.

⁵⁰ IOM . ‘Regional Ukraine Response : Situation Report 13’, 7 April 2022.

https://www.iom.int/sites/g/files/tmzbd1486/files/situation_reports/file/iom-regional-ukraine-response-external-sitrep-07042022-final.pdf.

⁵¹ Bohuslavets, Martyna. ‘The Law on Reconstruction of Regions: Poles of Growth or Areas of Recovery’. *Economichna Pravda* , 27 July 2022. <https://www.epravda.com.ua/columns/2022/07/27/689679/>.

⁵² Official website of the Parliament of Ukraine. ‘On the approval of the plan of priority actions of the Government for 2023’. Accessed 22 August 2023. <https://zakon.rada.gov.ua/go/221-2023-%D1%80>.

⁵³ Sustersic, Janez. ‘Coordination of Reconstruction and Recovery with the Regional Development Policy in Ukraine’. U-LEAD with Europe, May 2023. <https://u-lead.org.ua/storage/admin/files/3d2f6c654ea3384ca017ca6848ea59ef.pdf> .

⁵⁴ OECD. ‘The Architecture of Infrastructure Recovery in Ukraine’, 1 July 2022. <https://www.oecd.org/ukraine-hub/policy-responses/the-architecture-of-infrastructure-recovery-in-ukraine-d768a2e4/#snotes-d4e770>.

⁵⁵ Ibid.

⁵⁶ Anisimov, Oleksandr, Pavlo Fedoriv, Oleksandra Tkachenko, Lawson Julie, and Edwin Buitelaar. ‘Rebuilding a Place to Call Home. Sharing Knowledge for the Recovery of Ukraine’. PBL Netherlands Environmental Assessment Agency, 5 April 2023. <https://postconflictrecovery.org/2023/05/04/pbl-the-dutch-environmental-assessment-agency-launches-report-on-reconstruction-in-ukraine/https://postconflictrecovery.org/2023/05/04/pbl-the-dutch-environmental-assessment-agency-launches-report-on-reconstruction-in-ukraine/>.

⁵⁷ Decentralisation.gov.ua. ‘Spatial Planning in the New Administrative-Territorial Division’. Accessed 22 August 2023. <https://decentralization.gov.ua/admin/articles/12630.html>.

⁵⁸ Ibid.

⁵⁹ Parliament of Ukraine . ‘On amendments to some legislative acts of Ukraine regarding land use planning’. Accessed 22 August 2023. <https://zakon.rada.gov.ua/go/156-19>.

⁶⁰ Decentralisation.gov.ua. ‘Spatial Planning in the New Administrative-Territorial Division’. Accessed 22 August 2023. <https://decentralization.gov.ua/admin/articles/12630.html>.

⁶¹ Lohvytsk city territorial community - Poltava region. ‘Comprehensive spatial development planning is necessary not for bureaucrats but for people’, 2023. <https://lmr.gov.ua/news/1679486720/>.

⁶² OECD. ‘Turning to Regions and Local Governments to Rebuild Ukraine’, 2 December 2022. <https://www.oecd.org/ukraine-hub/policy-responses/turning-to-regions-and-local-governments-to-rebuild-ukraine-9510f490/>.

⁶³ Sustersic, Janez. ‘Coordination of Reconstruction and Recovery with the Regional Development Policy in Ukraine’. U-LEAD with Europe, May 2023.

⁶⁴ For instance, the draft restoration and development plans of regions will require approval from the MCTID and the draft plans of local communities from regional administrations; the regional development strategies need to be fully aligned with the state

strategy and approved by the MCTID.

⁶⁵ The project "Improving the efficiency and accountability of local self-government bodies" ("HOVERLA") assists the Government of Ukraine in promoting and implementing decentralization reform by supporting local self-government bodies in becoming more capable and accountable when delivering services to citizens.

⁶⁶ Ministry of Restoration of Ukraine Press Office. 'The USAID Project "Hovela" Announced a Partnership with 15 New Communities', 11 July 2023. <https://mtu.gov.ua/news/34499.html>.

⁶⁷ Ukrinform. '22 billion were allocated to local and regional reconstruction projects', 6 July 2023. <https://www.ukrinform.ua/rubric-vidbudova/3732234-na-miscevi-ta-regionalni-proekti-vidnovlenna-spramuvali-22-milardi.html>.

⁶⁸ Ukrinform. 'Funds from the Regional Restoration Fund will be directed to the reconstruction of six settlements - Nayem', 21 June 2023. <https://www.ukrinform.ua/rubric-vidbudova/3725963-kosti-fondu-vidnovlenna-gromad-spramuut-na-vidbudovu-sesti-naselenih-punktiv-najem.html>.

⁶⁹ Kosse, Iryna. 'Rebuilding Ukraine's Infrastructure after the War'. Vienna Institute for International Economic Studies, July 2023. <https://wiiw.ac.at/rebuilding-ukraine-s-infrastructure-after-the-war-dlp-6621.pdf>.

⁷⁰ World Bank; Government of Ukraine; European Union; United Nations.

Ukraine Rapid Damage and Needs Assessment : February 2022 - February 2023 (English). Washington, D.C. : World Bank Group.

<http://documents.worldbank.org/curated/en/099184503212328877/P1801740d1177f03c0ab180057556615497>

⁷¹ Government of Ukraine. National Recovery Council. 'Draft Plan of the Working Group of NRC on Recovery and development of infrastructure', July 2022. Accessed 25 June 2023.

<https://www.kmu.gov.ua/storage/app/sites/1/recoveryrada/eng/recovery-and-development-of-infrastructure-eng.pdf>.

⁷² European Commission. 'EU Countries' Nearly Zero-Energy Buildings National Plans'. Accessed 22 August 2023. https://energy.ec.europa.eu/publications/eu-countries-nearly-zero-energy-buildings-national-plans-0_en.

⁷³ European Commission. 'National Energy and Climate Plans'. Accessed 22 August 2023.

https://commission.europa.eu/energy-climate-change-environment/implementation-eu-countries/energy-and-climate-governance-and-reporting/national-energy-and-climate-plans_en.

⁷⁴ Government of Ukraine. National Recovery Council. 'Draft Plan of the Working Group of NRC on Recovery and development of infrastructure', July 2022 and European Commission. 'EU Countries' Nearly Zero-Energy Buildings National Plans'. Accessed 22 August 2023.

⁷⁵ European Commission. 'Nearly Zero-Energy Buildings'. Accessed 22 August 2023.

https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/nearly-zero-energy-buildings_en.

⁷⁶ CSIC and CPIP. 'The Role of Funding Financing, and Emerging Technologies in Delivering and Managing Infrastructure for 21st Century'. Text. New York, 2022. <https://www-smartinfrastucture.eng.cam.ac.uk/news/report-epsrc-nsf-infrastructure-workshop-new-york-2022-now-published>.

⁷⁷ These can incentivize public asset owners to assess and extract value that may be latent in infrastructure after decades of traditional operation and management techniques.

⁷⁸ Nadeem, Muhammad. 'The Future of BIM: Revolutionizing Construction Projects and Shaping the Industry Written'. LinkedIn, 23 March 2023. <https://www.linkedin.com/pulse/future-bim-revolutionizing-construction-projects-shaping-nadeem/>.

⁷⁹ Ibid.

⁸⁰ Afanasyev, Dmytro, Oleh Blonskyi, Mykola Kolomoyets, and Andre Poddubnyi. 'Concept Note on Implementation of BIM in Ukraine'. IPCM, EU in Ukraine, 2019.

⁸¹ Ibid.

⁸² The concept was adopted by the Government in 2021, the action plan is still in the making and should account for the war time specificities.

⁸³ Afanasyev, Dmytro, Oleh Blonskyi, Mykola Kolomoyets, and Andre Poddubnyi. 'Concept Note on Implementation of BIM in Ukraine'. IPCM, EU in Ukraine, 2019.

⁸⁴ MacAskill, Kristen. 'Public Interest and Participation in Planning and Infrastructure Decisions for Disaster Risk Management'. *International Journal of Disaster Risk Reduction* 39 (1 October 2019): 101200.

<https://doi.org/10.1016/j.ijdrr.2019.101200>.

⁸⁵ For comparison, 50% of citizens trust the government, 83% the President, and 96% the Armed Forces of Ukraine.

-
- ⁸⁶ Razumkov Center. 'Citizens' Assessment of the Situation in the Country and the Actions of the Authorities, Trust in Social Institutions (February–March 2023)', 15 March 2023. <https://razumkov.org.ua/napriamky/sotsiologichni-doslidzhennia/otsinka-gromadianamy-sytuatsii-v-kraini-ta-dii-vlady-dovira-do-sotsialnykh-institutiv-liutyi-berezen-2023r> .
- ⁸⁷ Supply Chain Sustainability School UK. 'Social Value and Design of the Built Environment', 2017. <https://www.supplychainschool.co.uk/wp-content/uploads/2019/10/Resource-ID-5670.pdf>.
- ⁸⁸ MacAskill, Kristen. 'Public Interest and Participation in Planning and Infrastructure Decisions for Disaster Risk Management'. *International Journal of Disaster Risk Reduction* 39 (1 October 2019): 101200. <https://doi.org/10.1016/j.ijdr.2019.101200>
- ⁸⁹ OECD (2022), *Rebuilding Ukraine by Reinforcing Regional and Municipal Governance*, OECD Multi-level Governance Studies, OECD Publishing, Paris, <https://doi.org/10.1787/63a6b479-en>.
- ⁹⁰ Ibid.
- ⁹¹ IAP2. 'Core Values, Ethics, Spectrum – The 3 Pillars of Public Participation - International Association for Public Participation'. Accessed 22 August 2023. <https://www.iap2.org/page/pillars>.
- ⁹² Stuart, Graeme. 'What Is the Spectrum of Public Participation?' *Sustaining Community* (blog), 13 February 2017. <https://sustainingcommunity.wordpress.com/2017/02/14/spectrum-of-public-participation/>.
- ⁹³ Organizing Engagement. 'Spectrum of Public Participation', 1 November 2019. <https://organizingengagement.org/models/spectrum-of-public-participation/>.
- ⁹⁴ Ibid.
- ⁹⁵ The local authorities of Chernihiv plan to reconstruct the Haharin sport stadium for USD 16 million, a decision heavily contested by civil society and broader population as too expensive and inappropriate for the time being. Source: <https://today.politeka.net/uk/411975-stadion-v-chernigove-otremontiruyut-za-620-mln-razgoraetsya-skandal-na-hto-potratyat-dengi>
- ⁹⁶ Supply Chain Sustainability School UK. 'Social Value and Design of the Built Environment', 2017. <https://www.supplychainschool.co.uk/wp-content/uploads/2019/10/Resource-ID-5670.pdf>.
- ⁹⁷ Ibid.
- ⁹⁸ Ibid.
- ⁹⁹ Ibid.
- ¹⁰⁰ Pancevski, Bojan. 'In Ukraine, Amputations Already Evoke Scale of World War I'. *Wall Street Journal*, 1 August 2023, sec. World. <https://www.wsj.com/articles/in-ukraine-a-surge-in-amputations-reveals-the-human-cost-of-russias-war-d0bca320> .
- ¹⁰¹ WWA Studios. 'Castlemaine Court', 5 January 2022. <https://www.wwa-studios.com/castlemaine-court/>.
- ¹⁰² Designingbuildings.co.uk. 'Lifetime Homes'. Definition; Guidance; Policy; Standard. Accessed 22 August 2023. https://www.designingbuildings.co.uk/wiki/Lifetime_homes.