Institute for Global Prosperity

FAST FORWARD >> 2030

Building Bridges for Ukraine

Pathways to Sustainable Prosperity

Edited by: Professor Henrietta L. Moore and Arthur Kay

About the Institute for Global Prosperity, University College London

The Institute for Global Prosperity (IGP) at UCL is dedicated to rethinking what prosperity means in the 21st century, moving beyond traditional economic measures like GDP to focus on human flourishing, social cohesion, and planetary sustainability. With a commitment to innovative, transdisciplinary research, the IGP works with governments, businesses, and civil society to develop new models for a fairer, more resilient global future.

About Fast Forward 2030

Fast Forward 2030 is a network of impact entrepreneurs hosted by the UCL Institute for Global Prosperity (IGP) to encourage transformative enterprises that challenge the status quo and deliver sustainability and prosperity for all.

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Foreword

Minister Yuliia Svyrydenko
First Deputy Prime Minister of Ukraine and Minister of Economy

There's one book I always keep on my desk – not for its pages, but for what it stands for. On the very last page is a small note: *Kharkiv, Factor-Druk.* A short line with a powerful story.

In May of last year, a Russian missile strike destroyed Ukraine's largest printing house. But just six months later, out of the ashes and debris, the team at Factor-Druk brought the machines back to life – and printed a new edition. Not just a book, but a statement; a symbol of resilience, and regeneration.

Ukraine's reconstruction effort doesn't wait for better times. It doesn't pause for headlines. It starts now – under the sound of sirens. It grows in defiance of our circumstances. And perhaps that is why it is so powerful.

This recovery goes beyond the familiar notion of building back better – it embraces a philosophy of building forward. We're committed to shaping a new Ukraine: modern, innovative, and built for the future. This goal presents us with an enormous challenge, and the scale of destruction is staggering: Ukraine's recovery and reconstruction needs over the next 10 years will amount to $524 billion, according to the latest RDNA.[1] That's why the driving force behind Ukraine's recovery must be the private sector.

Investing in Ukraine's reconstruction is no longer merely a political statement – it's a business opportunity, supported by a wide range of government incentives. Those who are first to recognize that reconstruction is not only a challenge, but also a $500 billion opportunity, will be the first to unlock its greatest fruits of prosperity.

The impact of these investments extends far beyond Ukraine itself – they are a foundational contribution to the strategic autonomy and lasting security of the entire European continent. Ukraine can become a new manufacturing base, a military arsenal, an energy hub, and a key player in the value chains of next-generation technologies.

To achieve that vision, global partnerships rooted in shared values and mutual interest are essential, and that's what makes the Bridges for Ukraine initiative so important. This paper offers a platform for joint thinking between Ukrainian and global experts – to expand the space for bold ideas about sustainable growth and long-term prosperity.

The rebuilt Ukraine must stand as proof that even in the darkest moments, a nation – with the right vision and the right allies – can rise from the ashes like a phoenix. My book from unbroken Kharkiv shows that it's not just our ambition, it's a reality.

Foreword

Minister Gareth Thomas MP
Minister for Services, Small Businesses and Exports,
UK Department for Business and Trade (DBT)

Russia's unprovoked invasion of Ukraine and the devastation it has brought to the Ukrainian people is an assault on Europe and our common values. The UK is committed to standing with Ukraine for as long as it takes, to secure a just and lasting peace. A lasting peace that restores a semblance of normal life, where Ukrainians can live, work, go to school, do business and enjoy the democratic freedoms of their country, in a safe and secure Europe.

In January 2025, the UK and Ukraine signed a 100-year partnership agreement formally recognizing the breadth of cooperation between our countries, and our joint commitment to a prosperous and resilient economy in Ukraine underpinned by enhanced trade and strengthened business relationships.

The Ukrainian Government has set out its vision of a better future for all Ukrainians, encapsulated in its policy of "build back better". The UK supports this vision and recognises that Ukraine's recovery and reconstruction will not only need the support of its friends and allies but also of the international business and investment community.

UK businesses have already played a key role in Ukraine's reconstruction, and as DBT's Minister for Services, Small Business and Exports, I believe the private sector has a crucial role to play in Ukraine's reconstruction. The scale of the challenge means this is not something that governments can do alone and support from the private sector is vital to achieve success in this endeavour.

I therefore welcome the Institute for Global Prosperity's paper "Bridges for Ukraine: Accelerating Opportunities for Reconstructing Ukraine" and its valuable contribution to thought leadership on this subject. I support the paper's focus on the contribution that entrepreneurs, small business and Business to Business partnerships can make to enrich and inspire support for Ukraine's reconstruction and economic recovery.

Introduction

Professor Dame Henrietta Moore
Founder and Director, Institute for Global Prosperity
at University College London

For just over a decade, the Institute for Global Prosperity at UCL (IGP) has been redesigning prosperity for the 21st century, changing the way we conceive and run our economies, and reworking our relationship with the planet.

Our vision has always been to build a prosperous, sustainable, global future, underpinned by the principles of fairness and justice, and allied to a realistic, long-term vision of humanity's place in the world.

Since 2022, Russia's ongoing war on Ukraine is estimated to have caused 170 billion euros' worth of damage to towns, villages, homes, schools, roads, railways and farmland. Yet ensuring the longevity of Ukraine's future is not simply a matter of securing international investment and restoring the essential infrastructures of the 20th century. The durability and resilience of a post-conflict Ukraine depends on grasping opportunities for reinvention and taking that new vision well beyond a simple rebuild.

In January 2025, the UK and Ukraine signed a 100-year partnership agreement to build military, economic and cultural ties.[2] Commitments matter, but they have to come supported by ideas, innovation, hard-headed design, feasible economic plans and flexible financing. 'Bridges for Ukraine' is a project borne out of the IGP's desire to nurture the kind of thought leadership that places innovation and collaboration at the core of cooperation with Ukrainian citizens, communities, businesses, civil society organisations and government officials. Collaborative thinking creates and sustains new opportunities for Ukrainians to build back better, and supports a reconstruction effort that is not only strengthened by international solidarity, but takes as its founding principle Ukrainian leadership, autonomy and innovation. Bridges for Ukraine highlights the key role of entrepreneurial partnerships in reconstructing a post-conflict Ukraine, and promotes knowledge and skills exchange between thought leaders, emerging businesses and scalable financing mechanisms, with the shared goal of rebuilding a Ukraine that is fit for the challenges of our planet's future.

This White Paper is published in a series led by Fast Forward 2030, a international network of impact entrepreneurs hosted by the IGP with the aim of reshaping the way we conduct businesses and economies, and designing transformative enterprises to deliver on the UN Sustainable Development Goals. Fast Forward entrepreneurs place environmental and social impact at the forefront of business innovation, governance and delivery.

In this White Paper, we bring together the valuable perspectives of a number of leading academics, policymakers and innovative enterprises from across Ukraine and the UK. In May 2025, we hosted a roundtable discussion at University College London, where thought leaders and small business innovators shared perspectives on the role of citizens in rebuilding cities and neighbourhoods; how nature-based solutions and digitisation can shape regenerative and resilient design; and how we can create financing models that value long-term resilience over short-term return. We met later in the same month with Ukrainian government delegates to discuss the role UK businesses can play in sustainable reconstruction.

In June 2025, we featured Bridges for Ukraine at the London Design Biennale, where the IGP pavilion 'People Powered Prosperity' explored how citizen-led co-creation can reshape our understanding of prosperity and unlock new forms of knowledge to tackle the most serious and pressing societal challenges. The IGP hosted a panel event on Ukraine led by FF2030 co-founder Arthur Kay. Here, designers were asked what regenerative design ought to look like, and how we might harness emerging technologies and nature-based solutions to encourage refuge, healing and sustainable prosperity. Finally, we anticipate the launch of the Bridges for Ukraine White Paper at the Ukraine Recovery Conference in Rome in July 2025.

Transformation is Underway

Building back better is something that Ukraine is involved in every day. Rebuilding does not wait for peace. Each direct hit requires action. Each residential building, road, hospital, and school destroyed has to be replaced in some shape or form. Reconstruction and rebuilding are perpetual in war, as Minister Svyrydenko makes clear in her foreword. But, beyond, the immediacy of creating shelter, care and safety for its citizens, Ukraine has undertaken an impressive commitment to designing its future. Concrete actions and legislation are setting in place the changes in governance, regulation, accountability and transparency need for EU membership, inward foreign investment and future collaborations. Ukraine is holding its future clearly in mind while fighting for its present survival.

// It is sometimes forgotten by those outside Ukraine that what we are dealing with is a full scale war in the heart of continental Europe.

It is sometimes forgotten by those outside Ukraine that what we are dealing with is a full scale war in the heart of continental Europe which has had disastrous consequences for energy and food security globally, not to mention rewriting the security map of Europe. The human and environmental toll of war has been devastating; destroyed cities, damaged water and energy infrastructure, ruined villages, unusable agricultural land, and large scale human displacement. Ukraine is home to roughly 35% of Europe's biodiversity, and despite the war government and citizens are actively working to protect it.[3] Environmental security is fundamental for a resilient future for Ukraine and the whole of Europe.

Building back better for a sustainable future means acting on many different issues across many different sectors simultaneously. It is not just a matter of policy prescription and adequate investment, but a huge design challenge in its own right. Delineating pathways to sustainable prosperity involves understanding and developing a whole systems approach to transformation that recognises the intersections between economic prosperity, societal well-being and environmental sustainability. As Vlad Mykhnenko describes in his vision for a new industrial strategy for Ukraine, this involves understanding the structural relationships within the economy and how changes in certain sectors will work together to produce intersecting and cascading benefits.

Many governments and finance ministries around the world have sought a whole systems approach to government that works to enhance cascading benefits across economies, societies and ecologies, but all remain actions in progress. In our work in the IGP, we have consistently advocated that one of the benefits of systems approaches is that they bring problems and constraints into focus in a way that allows governments to work with other stakeholders – citizens, communities, civil society, business – to collectively design, develop and fine tune solutions.

Some commentators have suggested that what is needed for Ukraine is a 21st century Marshall plan. While external support and investment will certainly require sustained co-ordination, a much more autonomous, diverse and collaborative model is needed in the 21st century, and one that starts with a proactive approach to engaging citizens, communities, cities and civil society organisations, fostering co-design and co-production to ensure that economic policies are aligned to local, regional and national contexts. This process is well underway already in Ukraine with communities, cities, SMEs and local organisations already designing solutions for future resilience across social, economic and environmental challenges. Just take a look at some of the examples given in the contributions to this White Paper!

// Rebuilding landscapes, economies, and social contracts is a multiscalar problem involving every level from the national economy to that of the smallest community.

Power of Partnerships

Rebuilding landscapes, economies, and social contracts is a multiscalar problem involving every level from the national economy to that of the smallest community, and must take account also of Ukraine's future European and global roles. Ukraine has globally significant digital capacity, huge potential for biofuels and green energy, important agricultural assets, and experienced military forces and technologies. These sectors will shape the macro contours of a future green economy, but bringing them into being will require sustainable partnerships and innovative financing mechanisms with collaborative partners who are willing to solve problems such as insurance and risk mitigation, as well as sharing important IP assets to help rebuild Ukraine whilst simultaneously developing their own resources and capabilities. These will need to be partnerships of equivalence with long term and sustainable returns in mind. Rebuilding Ukraine is a cross generation project.

Perhaps the major challenge is how to develop flexible financing that can focus on delivering outcomes. Sustainable Urban Net Zero Network for Ukraine (SUN4Ukraine) is a project assisting Ukrainian cities toward climate neutrality.[4] It involves technical support allied to capacity and capability assistance to empower Ukrainian cities to delivery recover strategies aligned with the EU green deal. 12 municipalities are working with international finance institutions and multilateral development banks to ensure that their pipeline of projects can deliver on their climate neutrality plans. Key here is an approach that finances tailored outcomes across sectors.

Many UK and European businesses are already working to design and implement the restoration of landscapes and cities at scale, while adapting infrastructural solutions that simultaneously address issues of regulation, governance, and transparency. Ukraine's Digital Restoration Ecosystem for Accountable Management (DREAM) platform is a unique governance mechanism that provides a single pipeline for all restoration projects.[5] It aims to monitor the effectiveness and efficiency of project delivery, provide transparency, and mitigate risks.

It is the first step in furnishing an audited list of government backed projects ready for financing and implementation. What makes this innovation important is that aside from addressing issues to do with financing, risk and accountability, the stated purpose of the DREAM platform is to build trust between governments, citizens, business, civil society and financial institutions.

Partnerships need to engage multiple stakeholders from civil society, business, government, cities and citizens. The aim is to integrated innovation from a wide range of actors across a series of intersecting goals. From a design, delivery and policy point of view the coordination of the micro (individual well-being and satisfaction) with the macro (labour market, policy, trade, fiscal policy, infrastructural investment) has to proceed through the local. People live in places and communities.

Macro economic policy mostly focuses on the means of change (income, employment, GDP) rather than the ends (quality of life, secure livelihoods, social care). Concentrating on quality of life and secure livelihoods for individuals and local communities sets a different set of policy targets. Importantly, it targets action at what can be called the meso level; the actual places, locales, relationships and resources within which people build their lives.

This is one of the key reasons why the intersections between social and physical infrastructures have to be developed together. The meso level is the privileged site of change for transforming quality of life and long-term prosperity of individuals and communities. It is the scale at which action is most urgently needed and the divergent configurations of people, places and assets with their specific interconnected trajectories of change mean that no one size fits all. The local maters for revival and regeneration because people are the key resource.

// The intersections between social and physical infrastructures have to be developed together.

The development of innovative and transformative strategies that are locally situated and co-ordinated is challenging, but it cannot begin with deracinated policy goals that are theoretically and methodologically identified, such as improved productivity and rising GDP, for these are often insufficiently engaged with the potential local drivers of change and long term social, economic, and environmental prosperity. There are many projects currently underway in Ukraine that recognise the importance of ecological restoration, social care, housing, energy, and support for displaced families and veterans as fundamental to restoring local economies and places. Ro3kvit is a coalition of professionals who worked on the Dnipro River Integrated Vision – Ukraine's largest river – combining ideas from planners, policy makers, experts and the public to connect the different scales – national, regional and local – involved in transforming the river into a green energy, climate friendly, economically and socially viable life line for Ukraine. This involved integrating social, cultural, ecological and economic outcomes across multiple sets of stakeholders to recreate a set of viable local economies.

This diversity of agents, communities and areas is potentially a powerful lever for future innovation but it has to begin with enhancing the participation of individuals and communities in processes of change. Local SMEs have a key role to play and they need to be integrated into large national and multinational consortia capable of working effectively at different scales and deploying innovative financing that is directed at improving quality of life for people and places.

An urgent need for housing, cheaper energy, green spaces, environmental regeneration, reduction in toxicity levels, and a host of other activities, are arenas where training, implementation and new jobs could be created at the local level to improve the local area itself and move towards carbon neutral living, green energy, improved food quality and secure livelihoods. Training workers in green construction techniques will be only one small element in the creation of a new labour market. However, it will require better data-sharing and collection of more relevant and compatible data in order to achieve well-thought through policies and joined-up strategies cutting across government departmental policy agendas. Equally important will be the support of citizens and communities to use open data and create grass roots solutions that deliver on local and national objectives. At the root of this revision of economic purpose and prosperity lies the advancement of citizens' capabilities and capacities to direct and deliver a future sustainable Ukraine. This would involve an ethic of care for people and planet as a foundational principle in the transformation of the economy as Mark Miodownik argues in his contribution.

Ukraine stands committed to position itself as a global leader in post-conflict, low-carbon reconstruction. Utilising a whole system approach, carbon neutral cities, regenerated agriculture and distributed energy systems it has the potential to become the model that the future transformation of Europe requires. The key to its success will be people powered prosperity.

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Ukraine: In focus

Science for Resilient Futures

Professor Mark Miodownik MBE

The functioning of a modern economy relies on an increasingly complex infrastructure. Citizens and businesses require access to electricity, gas, liquid and solid fuels, clean water, food supplies, sewage collection, waste collection, mobile phone networks, high-speed internet, road and rail networks, public transport, airports and airspace control, ports and harbour system, canals and river services and flood protection, digital banking systems and associated data centres. Once built these infrastructure services allow a modern citizen, family, or business to prosper.[7] A prosperity that is destroyed when the infrastructure breaks down. This is why the bombing of power plants, the blockading of ports, the destruction of bridges, roads and railways is used as a weapon of war.

Even without bombs, infrastructure failures will always occur. For example, in March 2025 there was a fire at an electricity substation serving Heathrow airport in London, Europe's busiest airport.[8] This occurrence caused the closure of the airport causing the cancellation of flights for 234,000 passengers. The lack of resilience of the airport's power system caused a national outcry even though it was only for 24 hours, such is importance attributed to well-functioning infrastructure. Such debates occur in every country they usually focus on the tension between cost efficiency and resilience. The costs of failure are paid by a wide range of stakeholders, whereas the cost of maintenance are paid by a single operator which means that good governance is a necessary overhead of infrastructure provision. Whether its road maintenance, or the provision of back-up generators, the costs must be balanced with the impact on other affected stakeholders. Fair and regulated allocation of costs and compensation payments for things like airport or bridge closures is thus deemed to require regulation to maximise the productivity of business and thus the economy.

It is important to understand that the organisations that carry out these operations are typically a patchwork of self-governing bodies that has evolved over time. There is no overarching system, despite infrastructure being the life-blood of a country. Each country's patchwork is different. Are some countries able to deliver more resilient infrastructure than others? If so, what are the key principles that lead to success? These are key questions not just because of the increasing complexity of infrastructure involving as it does everything from clean water to secure communication. But also because of the increasing interrelationship between different parts of the infrastructure. For example, digitisation and smart grids bring efficiency and reliability of electricity supplies but make them more vulnerable to failure when digital services fail or are attacked. The failure of electricity then affects other infrastructure systems in what is called a cascade effect.[9] Thus, resilience and effective governance, are often in opposition to efficiency and complexity. This tension is important to explicitly consider when making decisions about the rebuilding of Ukraine's infrastructure, especially as the investment decisions typically affect performance for 30-50 years, a key timeframe for the impact of climate change.

In times of peace and when natural disasters are rare, it makes sense for a society decide to minimise cost of maintaining the infrastructure and to deal with occasional failures as an when they occur. This can be described as a minimum resilience and maximum efficiency system. Is it largely how modern countries are set up. Infrastructures are minimally maintained and supply of food, water, fuel and electricity, communications are maximally efficient with little spare capacity or redundancy. For example, food and product services has moved to a globalised 'just in time' in model which reduces the costs of warehousing but relies on a well-functioning transport infrastructure. The supply chains are highly sophisticated, and shortages resulting in empty shelves are rare.

For citizens in developed economies such advances have reduced the costs of food and other goods, as well as convenience – products such as clothes, computers and appliances are delivered to their doors often less 24 hours after being ordered. However, with such efficiency and supply chain complexity comes reduced resilience to shocks of extreme climate events.[10] Geopolitical factors also influence resilience. For instance, essential products often run on software systems that are controlled by states and corporations that can withdraw them at will. In anticipation of an increase in such disruptive events the EU has recently advised all citizens to maintain a stockpile of 72 hours of food, water, batteries and physical money.[11]

The efficiency of modern supply chains has had another impact on resilience which is more subtle but nevertheless significant. In is now often cheaper to import food than to grow it locally, to import bottled water rather than maintain clean water supplies, to import a new generator rather than repair it locally.[12] The list of local infrastructure services that have become uneconomic has been growing steadily as globalisation of efficient supply chains has increased. Yet resilience to the shocks of lack of supply is directly related to the local skills, knowledge, volunteer organisations, and a culture of good local governance. Such aspects of a local community are hard to quantify, but increasingly they are being captured by a concept called social value.[13] The importance becomes clear in war zones such as Ukraine, survival relies on the engineering, practical care, and other social value of the local populations. The gradual hollowing out of social value through the influence of global actors is a threat to resilience.

// There is a chance to rebuild Ukraine with a decentralised infrastructure model where resilience is baked into the design.

An example is the increasing disposability of products such as appliances and electricals, clothes, and packaging. It has made global supply chains more efficient by externalising the costs of pollution. To deal with this some governments have been introducing extended producer responsibility taxes[14] to pay for waste collection and disposal. Very little of a modern waste stream can be recycled and so landfill and burning are the prevalent outcomes.[15] These practises are highly polluting to air, water and soils which affect local populations and biodiversity. They also strongly contribute to climate change. In contrast reusing, repairing and remanufacturing of items to prolong their utility, reduces imports, delivers income to the local economy, as well as social value.[16] It also increases infrastructure resilience, as was demonstrated during the Covid pandemic.

There is a chance to rebuild Ukraine with a decentralised infrastructure model where resilience is baked into the design. Such systems are always under threat when compared with more efficient globalised systems that benefit from economies of scale, larger market capitalisation and externalisation of waste and pollution. The redundancy and distributed nature of resilient local systems are more expensive in comparison. This makes it vital that the extra costs of resilient systems with higher social value, lower pollution and lower carbon emissions are openly articulated and defended at times of peace so that they can in place when hostilities start. The same argument also applies the effects of global warming as it becomes more extreme in the 21st century.

Housing

Anastasia Bobrova

Housing and war: where are we going to live?

"The country, poised forever between the terror of war and the horror of peace," is a quote from Arundhati Roy's *The God of Small Things* that, even though written in a different context, resonates strongly with me these days. These are the days between February and April 2025 when I read about the ceasefire while checking the updates on the Russian ballistic missiles flying toward Kyiv. These are the days of muffled explosions in the distance. These are the days overflowing with uncertainty, days when discussing the future feels almost delusional. Today, nothing frightens me more than war, and nothing petrifies me more than the so-called peace. Despite all-pervasive anxieties, I continue dreaming about the day-after-tomorrow when another reality is possible. This paper presents a step in that direction. Here, I discuss housing as one of the central pillars of Ukraine's recovery and argue that housing decommodification is a way toward achieving social and spatial justice.

Housing in Crisis

To understand the current housing challenges in Ukraine, it is first necessary to consider the historical context. As a result of the housing privatisation in the 1990s, most people in Ukraine owned their homes. Before February 2022, the commercial rental sector was relatively modest, and social housing practically did not exist[17]. Over the last three decades, housing policy focused on further supporting homeownership and, by extension, the construction business, ignoring broader needs for social housing and adequate rent regulation. Housing policy grounded in false priorities and values perpetuated social vulnerabilities and contributed to the geographies of inequality.

The long-lasting issues became particularly salient with the start of the Russian war of aggression against Ukraine. In the previous three years, the war left approximately 13% of all the housing stock either damaged or destroyed and affected at least 2,5 million households[18]. With 4,6 million internally displaced people[19], the housing needs increased and diversified. Today, access to affordable and secure homes is a cross-cutting issue for different social groups, especially the internally displaced.

"Housing is a foundation for everything," – an older internally displaced person tells me, an informant for one of Cedos' research projects[20]. The war forced this man to leave his home and flee for safety. Now, like thousands of others, he resides in a collective site – a temporary accommodation established in former dormitories, kindergartens, or sanatoriums. At the end of 2024, approximately 61,063 people lived in 1,079 collective sites across the country[21]. A collective site is not an ideal home. Given the chance, many would not have chosen such accommodation. However, the poorly regulated and overpriced rental sector hardly presents a safe alternative.

"My son works, but he cannot afford to rent an apartment. Housing rent simply does not match the salary," – argues another internally displaced person who lives in a collective site. As the gap between wages and rent widens, housing affordability becomes a challenge, especially for low- and middle-income households. Without access to adequate homes, people tend to remain in collective sites for prolonged periods, rent low-quality accommodation, or simply move to another neighbourhood or municipality.

Therefore, housing is also a prerequisite for integration. The assurance that there is a space for rest and recovery contributes to people's confidence in the future, enabling planning ahead and participating in community life. For internally displaced people, the decision of whether to remain in host municipalities, move to another city, or even return to unsafe territories often hinges on their ability to secure adequate housing.

Overall, mitigating the current housing crisis requires solutions beyond the acceleration of construction. It requires a profound transformation of housing policy and its objectives.

Day After Tomorrow

Build back better is the guiding principle of Ukraine's recovery. Nonetheless, the principle's political potential depends on who fills it with meaning. An empty signifier cannot guide the recovery process. Thus, the discussion has to move beyond declarations and identify specific goals for each field.

// Housing policy grounded in false priorities and values perpetuated social vulnerabilities and contributed to the geographies of inequality.

Setting such goals for housing might be particularly difficult, as housing remains a contested arena where different political, social, and economic interests intersect. The dichotomy between housing as *home* and as *real estate*[22] might pose a formidable constraint to the transformation of the Ukrainian housing sector. However, now the country has a chance to prioritise a right to housing above opportunities for real estate speculation. The first step is to abandon the cruel optimism[23] that housing needs can be addressed solely through market mechanisms. Hence, broad-based social and affordable housing has to become a key element of Ukraine's postwar recovery.

Channelling investment into social and affordable housing operated by responsible and financially sustainable housing companies is a way to mitigate both social and spatial inequalities. The public housing sector will serve as a check and balance on the commercial rental market. It will also allow internally displaced people to transit from collective sites and into long-term accommodation. For big cities, social housing is a chance to reclaim urban space and make life in central neighbourhoods affordable. It is also an opportunity to improve the quality of the built environment by introducing higher standards in buildings, including energy efficiency. Finally, adequate housing is a critical infrastructure that enables economic and social life.

Nonetheless, overcoming the path dependence within the housing policy in Ukraine is challenging and will not happen overnight. Developing a viable social and affordable housing sector requires the arduous work of activists, researchers, urban planners, and policymakers. It also needs a broader societal and political consensus about the necessary degree of housing decommodification. There is now a basis to start such a discussion. Today, there are countless examples of housing solidarity. People continue to support each other, offer their apartments for free, and help internally displaced persons to furnish their new homes – these patterns of mutual help are more common than they seem. While relying solely on grassroots mobilisation to address the growing housing need is impossible, I hope such solidarity will pave the way for a radical political transformation.

Cities

Alice Charles

Cities as catalysts for redevelopment

There is a fundamental need to create both a unified, macro-level strategy for Ukraine's long-term recovery, and a comprehensive bottom-up approach to spatial, social and economic redevelopment. Ukraine can build back better and efficiently elevate itself through its recovery and accession process.

A coordinated, collective and clearly communicated approach to recovery requires a focus on long-term resilience, climate adaptation, and human development potential, where security is paramount. For instance, Arup is working with the Norman Foster Foundation (NFF) and the city of Kharkiv to develop concepts for sustainable and resilient infrastructure, transport and building strategies. The vision for rebuilding Kharkiv is to create a vibrant, inclusive, innovative and sustainable city that serves as a beacon of hope, resilience and prosperity.

In delivering this vision for a hopeful future, cities must focus on catalytic projects and programmes that transcend single interventions and act as a force for positive systemic change. Cities and coordinated hromadas can significantly enhance societal benefits by championing cross-sector projects that drive an impactful step change in recovery and human development.

Fostering a transparent and positive environment for investment

Realising long-term beneficial recovery will require a supportive environment for investment, with financial backing from public, private and blended sources, underpinned by sustainable sources of sub-national revenue. To engender this positive environment and generate investor confidence, it is essential to consistently provide assurance and a clear understanding of the risks and return opportunities for potential participants. The governance of this market must be incontrovertible and clear, and deliver a transparent approach to risk mitigation, transfer and residual risk. This transparency in risk management will build trust among investors and stakeholders, ensuring stability throughout the redevelopment process.

// Cities are in a unique position to deliver this through unilateral democratic discourse and close community outreach.

As clusters of economic activities, cities are fundamental to deliver a recovery strategy. Urban agglomeration as a foundation for wider redevelopment is critical to mitigate risk and demonstrate to the investment community that Ukrainian cities are a priority proposition for international redevelopment finance. To unlock this redevelopment finance, cities should collaborate closely with regional and national governments to encourage participation from the full capital investment stack, including international aid, government funding, multilateral development investment and providers of blended and private finance. This approach has the potential to maximise the societal return on investment during recovery, ensuring that Ukrainian cities and hromadas can establish a lasting reputation as excellent places to invest and do business for generations to come.

Championing alignment with European governance and policy

As Ukraine progresses through the European Union accession process, recovery is an opportunity to align national policies and local-regional development plans with the European Commission policies for Sustainable Prosperity and Competitiveness, Climate and Environmental Action, Defence and Security, Digital and Technological Innovation and Social Fairness and Solidarity. It is also essential for Ukraine's long-term sustainable development to transparently address challenges related to corruption, democratic process, societal and citizen engagement, equity, diversity and inclusivity. Cities are in a unique position to deliver this through unilateral democratic discourse and close community outreach.

To ensure that project and programme development align with these policy aims, national and international contemporaries can engage with Ukrainian cities to share lessons, best practices and develop their capacity and capability to implement projects that deliver policy outcomes both from a Ukrainian and EU perspective. This alignment will not only reduce friction in securing funding and financing from European entities but also ensure that Ukraine benefits from investor confidence in the stable environment of the EU, a sentiment reflected in recent surveys of international investor confidence in volatile times.

Aligning with the European approach to collective integrity and transparency through public procurement will be the backbone of Ukraine's successful redevelopment, enhancing investor and business confidence in Ukraine, with cities playing a key role in this implementation. Ukrainian cities and hromadas must continue to use their platforms for democratic citizen engagement to raise awareness about the negative impacts of corruption and promote a culture of integrity, and further support a smooth accession to the EU. They should collectively support the harmonising of definitions and penalties for corruption offences with EU states, as well as fulfilling obligations under the UN Convention Against Corruption (UNCAC). It will also be important to advocate for alignment with the EU's broader definition of offences beyond bribery, including misappropriation, trading in influence, abuse of functions, obstruction of justice and illicit enrichment. Cities can align with and start to implement established EU rules on public procurement, dispute resolution, support enforcement activities and ensure transparency and accountability in public contracting.

Early engagement with IFIs, MDBs and Institutional Investors to shape opportunities

Once Ukraine, its cities and its hromadas have outlined their plans to build back better, it is essential to develop a pipeline of projects that are ready for investment, procurement and delivery to achieve this vision. Russia's invasion of Ukraine has left no sector of Ukrainian cities and communities untouched from damage, destruction and loss; from educational institutions, playgrounds and hospitals to residential developments, transportation networks and key energy generation and transmission hubs. There must be a clear plan for engagement with funding and financing institutions for all sectors of the built environment.

This engagement with funding institutions is a key element of the Sustainable Urban Net Zero Network for Ukraine (SUN4Ukraine) project – a multi-year initiative aimed at guiding Ukrainian cities towards climate neutrality. Arup is a proud partner of SUN4Ukraine, which will support capacity and capability building efforts for cities, in alignment with the European Commission's Green Deal. Through a tailored capacity-building programme and comprehensive technical support, this project empowers Ukrainian cities to seamlessly integrate climate-neutrality plans into their recovery strategies, paving the way for sustainable and resilient urban development. As part of this initiative, the 12 flagship municipalities will be engaging with International Finance Institutions (IFIs) and Multilateral Development Banks (MDBs) to align their pipeline of redevelopment works, within their climate-neutrality plans, to include key considerations such as bankability, thematic focus areas and critical infrastructure priorities.

As the critical catalysts for Ukrainian redevelopment, cities and hromadas have a key role to play in development planning and bringing the programmes and projects to fruition with the support of these essential entities. Understanding requirements and restrictions of partners like government aid agencies, IFIs and MDBs by project type is crucial for effective risk-reward balancing, allocation and development. This is particularly important given the need to focus proportionally on rebuilding Ukrainian defence, security and nuclear energy infrastructure systems to support the long-term sustainable prosperity of Ukrainian society.

// Aligning with the European approach to collective integrity and transparency through public procurement will be the backbone of Ukraine's successful redevelopment.

Citizens

Orysia Lutsevych OBE

Neo-polis: how citizens in Ukraine reshape the future of their cities

Mariupol, Volnovakha, Bakhmut – are the scar-cities on the map of Ukraine. Russia has fully or partially raised them to the ground. They are currently on the occupied territories. But others, Kharkiv, Zaporizhzhia, Dnipro, Kherson are heavily bombarded nightly. Putin's goal is to make Ukraine uninhabitable. He is waging a total war. The battlefield is not limited to an isolated geography in the east or the Black Sea. Russian drones and missiles almost nightly attack the sleeping cities and villages of Ukraine. From 28 September, 2022, to 1 September, 2024, Russia launched a total of 11 466 missiles. On average, 23.2 missiles daily[24]. The frequent use of glide bombs with heavy-weight explosives and low precision cause horrible damage to civilian infrastructure.

// 13 per cent of the total housing stock has been damaged or destroyed, affecting more than 2.5 million households.[25]

Of all urban ecosystem, housing has suffered one of the highest damages. 13 per cent of the total housing stock has been damaged or destroyed, affecting more than 2.5 million households.[25] However, cultural sites, schools, hospitals, and kindergartens are not spared and are often targeted intentionally. Rebuilding public infrastructure and housing is key for injecting new economic life into these communities and encouraging the return of Ukrainian refugees.

Indeed, millions of Ukrainians have fled the warzone and resettled internally, tearing apart old connections and struggling to plant roots in new locations. Many have fled to the EU seeking better life and protection. But many more remain inside Ukraine, including under the horrific shelling. These people resist by maintaining normalcy in the face of the daily horror and sustaining hope that Ukraine will rebuild a better life, more 'green' and with a human-centric approach in mind. The displacement is painful and dangerous if neglected. It is exactly in this space that many non-profits swiftly stepped to bring the light of hope.

This hope for renewed community life is nurtured by a dynamic group of civil society organizations, dedicated mayors, members of local councils, and local businesses. Often their work is financed by western donors. This powerful coalition for rebuilding for Ukraine is already working hard to provide emergency rebuilding, alongside planning for the post-war future. Chatham House's annual recovery survey demonstrates that 80 per cent of Ukraine's non-profits are already involved in repairing the damage caused by the Russian invasion. 55 per cent of these groups already engage in post-war recovery planning with the local and national authorities.[26]

// Ukrainian civil society is not just the watchdog of rebuilding, it is also a sledgedog.

To bounce back from the shock of war, Ukraine will need powerful amplifiers. Citizen participation in recovery could be one of those factors that ensure the process of rebuilding is efficient, fit for purpose and advances Ukraine in terms of social development. Trust-based recovery will lower the costs of many transactions, as civil society will monitor large infrastructural projects and facilitate the inclusion of those impacted by the rebuilding process.

This is already enabled by the new transparent state-owned system called DREAM (Digital Reconstruction Ecosystem for Accountable Management)[27]. It provides open access to a full cycle of reconstruction projects funded either by the state or western donors. There are several independent civil society-led monitoring such a Big Recovery Portal[28] and Recovery Spending Watchdog.[29]

But Ukrainian civil society is not just the watchdog of rebuilding, it is also a sledgedog. Given weakened capacity at the local level due to the mobilization of a large number of people into the armed forces, the non-profit sector is filling the gap. Many groups, such as Brave to Rebuild, Dobrobat, and Building Ukraine Together (BUR) assist families repair damaged housing and renovate hospitals, clear the rubble from public sites, and patch broken windows. Others, such as SaveEd[30] dedicate their efforts to create comfortable, well-designed and well-equipped educational spaces in the old-fashioned bomb shelters to enable undisrupted education.

Groups that work on bringing traumatized communities together to plan the future and promote new approaches to urban planning have a powerful transformative effect. They may not be working immediately with fixing the critical public infrastructure, but they heal social fabric of the community by creating a safe space to have a conversation and chart a pathway to a common community action. Our survey indicates that Ukrainian non-profit sector sees itself as contributor of innovative solutions to rebuilding Ukraine, with 54% of organisations suggesting it is their main added value to the process. Groups like Rozkvit, CEDOS, Agency for Recovery and Development, ReStart[31] all have hands-on involvement in supporting various communities to develop programmes of holistic recovery. Citizen engagement is always a key principle. As of today, 151 out of 1469 communities already have such comprehensive plans.

The work goes beyond planning and offer tangible change in the community. Rozkvit is an urban coalition of over 100 professionals from Ukraine and abroad that support communities in designing their own spaces that would encourage horizontal connections, enable common action, and boost local drive for rebuilding.[32] They do not come with ready solutions. But happy to share best practices from various European cities to inspire the imagination of new ways of living in the community.

CEDOS is an independent think tank, urban bureau that is working on social and spatial development. As part of their New European Bauhaus programme, CEDOS engages with 20 small communities (up to 100 000 inhabitants) to set up the Centers of Community Rebuilding. Often based in libraries or cultural centers, a key feature of these spaces is physical and social inclusion. They become spaces for open discussions, book clubs, educational workshops, crafts clubs. Some offer citizen advice to internally displaced and veterans. CEDOS sees how strong an organic need for people to come together in these dark times is.[33]

Promprylad in the west leads the regeneration of the old industrial site to create a modern space for culture, urban renovation, re-skilling of people and entrepreneurship.[34] The ambition of the organisation is to create space for socio-cultural integration for over 30 000 Ukrainian IDPs, who fled to the west of the country.

All these initiatives enable 'soft' recovery – the remaking of life after trauma, displacement and loss of social connection. They revive the polis culture, where citizens have an open independent space. They become co-creators of their habitat, not just consumers of goods or services.

Citizens and civil society groups have an enabling environment thanks to the process of decentralization that started in Ukraine after the Revolution of Dignity in 2014. The groundbreaking reform broke away from the dysfunctional Soviet legacy of paternalism and centralized control.[35] It moved fiscal resources down to the community level and devolved powers. This made the government more independent and closer to the people. The share of community-generated tax income in local budgets increased from 35% in 2017 to 70% in 2022.[36] This allowed communities to shape their local economic development policies, invest more in public infrastructure and created momentum for more transparency. Before the full-scale invasion nearly 200 communities implemented participatory budgeting and engaged citizens in decisions on local budget allocations. All of this resulted in growing trust to local government and increased support for democracy as form of government[37]. A rare commodity in the times of global democratic backsliding.

// The resilience generated by active citizens feeling the power that their actions can make a difference.

Today this civic inter-connectedness gives Ukraine the strength to sustain such a brutal attack and successfully repel Russian aggression. It is an important safeguard for Ukraine's democracy that endures even in wartime under martial law. So when Trump said that Ukraine has no cards to play to end the war with Russia, local community leaders responded – they are the most important card Zelenskyy has. And they are right. It is exactly this local agency that nurtures societal resilience. The resilience generated by active citizens feeling the power that their actions can make a difference: the power to imagine and work toward the future, re-discover new roots in the community. Independent civil society, to re-phrase Jose Ortega y Gasset, creates a series of collisions with the future. These groups not simply offer a sum of what Ukraine has been (before the war) but chart a pathway of what it yearns to become.

Culture

Dr. Gus Casely-Hayford OBE

Like most teenagers, I generally ignored the advice of my parents, my government, and the newspapers and in the spirit of teenage obduracy, in the fading months of the administration, I set out to see the Soviet Union for myself. I had recently read Laurie Lee and Hemingway, and like my new literary heroes, I wanted to be there to experience history unfolding in the raw. And the most thrilling political frontier in the late Eighties was Eastern Europe. I wanted to get beyond Leningrad and Moscow, and the carved bears and painted tea pots in the Beryozka to see the unreported nation before inevitable change. I caught a series of trains across Russia to the Caspian Sea and then worked my way through the Caucasus, traveling by bus through Azerbaijan, Armenia, and eventually I arrived in Ukraine in mid-August.

Towards the end of my stay, I spent a few dizzy nights in Kyiv, a city drunk on the prospect of change. You could feel the ambient hope, expectation and excitement in the air. In the evenings when the temperature would allow, I would join a group of young Ukrainian men playing soccer behind my hotel. I spoke no Ukrainian, and almost no Russian, but I did speak football and over a number of evenings, we built the kind of football relationship that connects unalike peoples across the world. The night before I went home, my new friends invited me to go and watch two soccer titans: Dynamo Kiev and Zenit Leningrad play at the Olympic stadium. I now barely remember the game, but one passage of play has etched itself upon my memory. Against the run of the game, the ancient Ukrainian striker, Olev Blokhin, scored a late winner. It was a rough, ugly, hard-fought, stumbling, journeyman's goal that was all about guts and love and heart. The celebrations rocked the home stand on its foundations – the song of tens of thousands of fans rang out across the city – and perhaps for the first time, I understood what culture might do for a new nation, what identity can mean, how it can connect, define, cohere, how it can build community and hope.

Healthy societies need culture but for war-torn, embattled, destabilized societies, culture can take on a critical role. At its best, culture is a societal thermometer, a communal coagulant and an agent of catharsis; it can be deployed as both a bellwether of well-being and as a mechanism for healing, unification and reflection. It is a window through which we can evaluate and understand, but also deliver an emotionally remedial programme. We need culture in our lives for healthy societies, but we desperately need culture for damaged, embattled societies as the space within which we might consider what healing might mean and to imagine and negotiate new possibilities. To teach the arts to the young and to expose them to communal creative opportunity does not just fortify them but it also builds the emotional competences and intelligence against which wider societal cohesion might happen.

// Healthy societies need culture but for war-torn, embattled, destabilized societies, culture can take on a critical role.

In my present role as the Director of a new British national museum and collections centre in East London (V&A East) I have witnessed first-hand the power of culture to change lives. Many of the young people of East London are from families of migrants and refugees. Some of these are communities of individuals that have been exposed to the brutalities of war, they have been dispossessed and terrorized and forced to flee regions of horrendous conflict, leaving behind families and familiar ways of being. The varied impacts of that trauma are profound; there is evidence of post-traumatic stress disorder and high rates of childhood depression and anxiety. Many young people have seen their homes, communities and relationships destroyed and many have yet to develop the emotional and intellectual competencies to express their rage and upset well, to share their stories, to reflect, decompress and begin to heal within a new culture. The psychological repercussions that conflict can foster, the behavioural, academic, and relational impacts that can result from war, can metastasize and create generational, epigenetic outcomes. We need to intervene early. Cultural institutions are not helpless. With resource and support there are varied forms of intervention that can be effective, welcome and useful from deep longitudinal programmes to big hearts and minds campaigns of engagement.

Culture and education have an important role in healing, building space to record, to bear witness, to reflect a shared narrative, but also in the therapeutic work of rebuilding connections and confidence within communities. In Ukraine, a nation with a rich history of museums of exhibition making, of discrete conventions of making, of a wide creative curriculum in schools, there is huge potential to address the obvious need. War, violence and ambient societal instability can create dysfunctional cycles. Protracted periods of war deprive the young of the necessary space for cognitive-emotional processing and growth. As we know from other regions of the world, from other war zones, the damage done by war-related trauma is very difficult to remediate and it can foster wider dysfunction that can become deeply acculturated. Culture and education are important in all societies, but in embattled states like Ukraine, they can take on a critical role in resetting psychosocial balance.

// The psychological repercussions that conflict can foster, the behavioural, academic, and relational impacts that can result from war, can metastasize and create generational, epigenetic outcomes.

I hope to revisit Ukraine one day; to reconnect with the peaceful, proud, generous nation that I visited all those years ago. My old knees probably wouldn't take a football match in the streets, but I would love to see how culture might be deployed in reinvesting that sense of hope, self-confidence and communal spirit that I remember. Connecting people to heritage, but also to hope in the future, and the communal possibilities that culture can so powerfully engender are important for any healthy nation but for Ukraine today they seem vital. And it feels incumbent upon us all to support Ukraine in finding the means, the space to build back those possibilities for its children.

Digital & AI

Martha Lane Fox CBE

Rebuilding Ukraine presents a unique opportunity not just to restore what has been lost, but to design systems that meet the demands of the 21st century. Among the many challenges facing the country, one of the most transformative will be the development and integration of digital technologies and artificial intelligence. This is not just a technical issue. It touches on how Ukraine redefines its relationship with citizens, ensures access to services, manages information and trust, and builds institutions that are more transparent, inclusive and effective.

Before the full-scale invasion, Ukraine had already taken bold steps in this direction. The Diia platform – used by millions – stood out globally as one of the most comprehensive digital public service systems. It demonstrated that government services could be fast, responsive, and user-focused, not by digitising old processes, but by rethinking them entirely. In doing so, Ukraine showed that innovation isn't confined to large or wealthy nations.

Since the war began, digital tools have been central to resilience efforts. They have enabled everything from emergency response coordination and direct financial support to continued education and civic participation across borders. Now, as Ukraine moves into a new phase of reconstruction, there is a clear opportunity to take digital integration further – embedding it not as a supporting function, but as a central component of governance, service delivery and economic renewal.

// Among the many challenges facing the country, one of the most transformative will be the development and integration of digital technologies and artificial intelligence.

This will require more than ambition. It will take deliberate design choices, investment in digital capacity across society, and a commitment to inclusion. Digital technologies cut across every domain – health, education, housing, energy – and their benefits will only be realised if they are built with trust, security and usability in mind. Otherwise, digital infrastructure risks reinforcing existing inequalities or creating new barriers.

Trust must be at the centre of this effort. Open-source development is a practical starting point – it ensures transparency and invites collaboration. So too is strong data protection. Citizens must feel confident in how their data is handled and safeguarded, especially in a context where digital systems have been targeted and trust in institutions has been tested. A digital society depends not just on the availability of services, but on their legitimacy.

Ukraine also has a significant advantage in its talent base. With a strong tech ecosystem, a digitally engaged population, and a network of global partners, the country is well positioned to shape how AI is applied in public life. But this moment requires careful judgement. There are real choices to make about how technologies are used, who they serve, and how they are governed. The current global model of AI development – often led by private firms with limited oversight – has produced powerful tools, but not always in ways that align with public needs or democratic values.

Ukraine could take a different path. The focus could be on using AI to support access to services, improve decision-making in local government, strengthen education delivery, or assist with infrastructure planning and maintenance. These applications may be less headline-grabbing than some of the promises surrounding AI, but they are likely to have far greater impact in real people's lives. Tools that enhance rather than replace human judgment, systems that are accountable and auditable, and policies that ensure equitable access – these should be the benchmarks.

A strong digital foundation depends not only on national systems, but also on local capability. This includes public sector digital skills, private sector innovation, and grassroots participation. Ukraine's network of small and mid-sized tech firms already plays a key role here, creating solutions tailored to the specific challenges of displacement, reconstruction and service delivery. These firms need to be supported – not just with funding, but with access to public procurement, clear regulation, and opportunities to scale their work.

The role of international partners will be important, but support must be grounded in long-term collaboration, not short-term technical assistance. The UK and other countries can offer resources, expertise and connection to global innovation networks. Yet they must also recognise that Ukraine is already leading in many areas. Effective partnerships will be those that listen, learn and co-design solutions – not impose them.

Equally important is the digital inclusion agenda. As Ukraine modernises its infrastructure, it must avoid entrenching digital divides. Whether through universal connectivity, accessible platforms, or tailored support for vulnerable groups, a commitment to inclusion must be built into every digital initiative. No one should be excluded from essential services or civic participation because of geography, disability, age or income.

Digital systems reflect the values of the people who build them. The decisions made now – about governance, ownership, transparency and ethics – will shape Ukraine's future society as much as decisions about physical reconstruction. In this context, technology is not neutral. It should be used to distribute power, not concentrate it; to expand rights, not curtail them; to foster accountability, not surveillance.

Rebuilding Ukraine will be a generational effort. But if digital systems are prioritised alongside physical infrastructure – and designed with care – they can help rebuild not only what was destroyed, but also trust in public institutions. Good design will enable a state that works to make lives easier for all citizens. By building on the foundations of Ukraine's remarkable digital leadership, the country will be fit for purpose in an AI first world. Their next chapter could be about turning the experience they have built into a sustainable and inclusive model for long-term prosperity.

// Ukraine is already leading in many areas. Effective partnerships will be those that listen learn and co-design solutions – not impose them.

Energy Systems

Nataliya Katser-Buchkovska

Reconstructing Ukraine's Energy Future: Avoiding Carbon Lock-In Through Green Finance

The Crisis and the Call for Climate-Conscious Reconstruction

Over the last 3 years of Russia's full-scale invasion, Ukraine has lost more than 50% of its energy generation capacity due to the destruction of 9 GW of baseload power. As of 2024, over 70% of Ukraine's thermal generation infrastructure is knocked out, and the Zaporizhzhia nuclear power plant is under occupation, whereas more than 25% of the country's renewable energy is damaged or occupied. Key high-voltage substations, distribution lines, and energy storage facilities have also been targeted, pushing the grid to the brink of collapse in many regions, while millions of Ukrainians were forced to flee to other parts of the country, especially in the rural and war-affected areas, experience rolling blackouts or complete disconnection from the national grid.

// Over the last 3 years of Russia's full-scale invasion, Ukraine has lost more than 50% of its energy generation capacity.

This extensive damage has resulted in profound financial impacts exceeding $16.1 billion for the energy sector. Direct damage to power generation facilities alone amounts to $8.5 billion, with a further $2.1 billion in trunk line damages. According to the recent World Bank estimates, the overall financial losses to the energy sector are estimated t nearly $40 billion, with restoration needs projected at around $50 billion, in direct investment to rebuild, while the broader reconstruction efforts are estimated to exceed €480 billion over the next decade.

Moreover, the extensive use of traditional sources of energy causes negative impacts on Ukraine's environment, which has already been significantly affected by the military actions. At the same time, Ukraine remains committed to achieving a 65% reduction in GHG emissions by 2030 under its Nationally Determined Contribution (NDC) and implementing its National Energy and Climate Plan (NECP), both of which align with the EU Green Deal and requirements for eventual accession to the European Union.

Internationally, recent developments at COP29 in November 2024 have set new benchmarks, with the global community agreeing to mobilise up to $300 billion annually by 2035, aiming for $1.3 trillion in annual climate investments to support developing nations. This decision, effectively tripling previous commitments of $100 billion annually, creates unprecedented opportunities for Ukraine to attract international financing for green investments, positioning itself as a potential European hub for climate-conscious reconstruction.

Ukraine stands at a pivotal crossroads: will it rebuild rapidly with familiar, fossil-based infrastructure, risking long-term carbon lock-in? To be a resource base for other countries? Or will it seize this moment to implement transformative green investment strategies, leveraging global climate finance to construct a resilient, decentralised, and sustainable energy future?

The Problem: Financing Gaps and Structural Barriers

Despite Ukraine's ambitious climate goals, private renewable energy projects face serious obstacles. Many initiatives remain stalled at the feasibility stage due to gaps in early-stage funding, underdeveloped capital markets, and high country risk.

Ukraine's local financial markets and players are not yet equipped to provide long-term, concessional loans or equity financing for clean energy projects. Without accessible credit, risk mitigation instruments, and new revenue models, developers struggle to reach financial closure.

On top of these financial challenges, security and policy uncertainty further discourage investment. Therefore, Ukraine just started implementing projects under the Article 6.2 mechanisms of the Paris Agreement. This limits opportunities to monetise mitigation outcomes and leverage carbon revenues to improve project bankability.

The Solution: New Project Finance Design and Enabling Policy

To achieve sustainable reconstruction, Ukraine must focus on delivering systemic transformation rather than repeating old practices. In particular, this means designing energy systems that are resilient to future shocks and also aligned with global climate goals, community needs, and Ukraine's long-term development trajectory. This can be done through a new project finance model tailored to post-conflict realities. This model should integrate climate finance instruments, de-risking tools, and carbon market revenues to attract blended capital.

// Despite Ukraine's ambitious climate goals, private renewable energy projects face serious obstacles.

Firstly, investment projects in post-conflict settings require early-stage support from concessional sources. Ukraine's energy sector recovery, in particular, stands to benefit from a multi-layered financing strategy that includes grants, first-loss equity, and technical assistance. These tools help de-risk investments and advance projects to a ready-to-build (RTB) status. In doing so, Ukraine can unlock funding from institutional and private investors seeking opportunities that align with environmental and social impact objectives.

Secondly, approach to de-risking the projects aggregation and pool-based investment. The fragmentation of Ukraine's renewable energy landscape limits its appeal to international investors. Aggregating projects into portfolios grouped by region, technology, or emissions impact can enhance scale and reduce risk. This model enables standardisation in documentation, credit assessment, and project evaluation, streamlining due diligence and accelerating capital deployment.

Thirdly, projects in Ukraine can attract green capital through the global voluntary carbon market. Valued at over $2 billion today and projected to grow to $250 billion by 2050, it is an opportunity for Ukrainian businesses. Through the monetisation of mitigation activities developers can incorporate carbon credit revenue streams into their business case modelling, improving internal rates of return and mobilising private capital. This can be done by introducing carbon credits trading mechanisms under Article 6.2 of the Paris Agreement and voluntary standards (e.g., Verra, Gold Standard), which will enable Ukraine to participate in high-integrity carbon markets and attract financial flow.

Finally, reconstruction must incorporate cutting-edge policy design rooted in ESG principles and social inclusion. Energy investments should deliver social value, reskilling war veterans for green jobs, promoting gender equity, and introducing community co-ownership structures that empower local populations. These elements are not only ethically essential; they are strategic tools for creating long-term stability and buy-in at the local level.

The Result: Green Reconstruction of Ukraine avoiding carbon lock-in through systemic transformation and just transition

The successful implementation of green finance and policy frameworks will transform Ukraine's energy landscape. In particular, the already established, decentralisation reform is transforming the energy systems and autonomy of local communities. These systems enhance energy security and empower communities due to autonomy, speeding up the rate of reconstruction.

Green reconstruction will also drive large-scale employment through the creation of climate-resilient jobs. Former coal workers and war veterans, among others, can be retrained to take on roles in solar, wind, hydrogen, and carbon monitoring sectors, building a new workforce that aligns with the energy needs of the future. Also, the inclusion of women in Ukraine's green economy will help their re-entry into STEM and clean energy fields will help reduce gender inequality and ensure diverse perspectives are embedded into the design and delivery of energy solutions. These are critical steps toward economic recovery, social reintegration, and just transition.

Integrating carbon credit-backed projects into the reconstruction process enables Ukraine to make measurable progress toward its Nationally Determined Contributions (NDCs) while avoiding long-term fossil fuel lock-in. These projects also provide a valuable revenue stream that improves the financial viability of sustainable infrastructure.

Finally, by establishing transparent regulation and piloting blended finance models, Ukraine will strengthen investor confidence and position itself as a global leader in post-conflict, low-carbon reconstruction. Ultimately, the success of Ukraine's energy transition hinges on more than rebuilding infrastructure. It requires reimagining how projects are designed, financed, and scaled to serve communities, attract investment, and meet global climate goals. This transformation will not only enhance Ukraine's energy security but also position it as a leader in resilient, low-carbon development forpost-conflict economies worldwide.

Industrial Strategy

Professor Vlad Mykhnenko

Post-war Ukraine faces a monumental reconstruction task. As of 31st December 2024, according to Ukraine Fourth Rapid Damage and Needs Assessment by the World Bank, in collaboration with the Government of Ukraine, the European Union, and the United Nations, total direct damage that Ukraine has suffered since Russia's full-scale invasion were estimated to reach $176.1 billion (€170 bn), with housing, transport, energy and mining, commerce and industry, and education and science being the five most affected sectors. This damage estimate only covers direct costs of destroyed or damaged physical assets and infrastructure, valued in monetary terms, with costs being projected at the replacement price prevailing before the February 2022 invasion. Furthermore, the World Bank has put the total cost of reconstruction and recovery in Ukraine at $523.6 billion (€506 bn), over a ten-year period. Overall, Ukraine's recovery needs, as currently estimated, amount to 2.8 times its nominal gross domestic product (GDP).[38]

// The World Bank has put the total cost of reconstruction and recovery in Ukraine at $523.6 billion (€506 bn), over a ten-year period.

Putting the thorny – and critical – question of who shall be paying for Ukraine's post-war reconstruction aside, one must start planning for the macroeconomic as well as spatial economic impact of the nation's rebuilding in the long run. Ukraine's reconstruction and recovery needs will have to inform its industrial policy, especially, in terms of the allocation of scarce labour resources. At the same time, the country's nascent industrial strategy ought to drive the key economic decision-making itself, prioritising defence and security industries, whilst embracing new building-back-better principles, incorporating a shift towards lower energy intensity, net-zero greenhouse gas emissions, and modern standards for climate resilience and inclusive design.

The first steps in Ukraine's post-war economic planning should include the analysis of the interdependence in its production system. The input-output (I-O) analysis provides the necessary tools for a systematic study of the complex inter-industrial transactions in a network of sales and purchases between various sectors of a national economy.[39] The I-O analysis is increasingly used internationally for describing and interpreting the whole economy of a territory as a single system, with directly observable – and measurable – basic structural relationships.[40]

// Ukraine's reconstruction and recovery needs will have to inform its industrial policy, especially, in terms of the allocation of scarce labour resources.

Following the I-O methodology, based on Leontief matrix algebra calculations of supply and use data tables, which are produced by many national statistical agencies, including Ukraine's, one can assess the impact of an increase in spend (final demand) for a particular product, given that there will be an equivalent increase in the output of that industry, as the latter reacts to meet the increased demand (direct effect). As the producers increase their output, they have to buy more intermediary inputs from the domestic suppliers, which, in turn, will be increasing their production, too (indirect effect). The combined direct and indirect effects of an increase in final demand are called 'simple' or Type I multiplier. Consequently, as a result of these direct and indirect effects, the level of household income tends to increase throughout the domestic economy, given that extra human-hours to be spent on satisfying the increased demand will be additionally remunerated. A part of this increased income will be re-spent on domestically produced products (induced effect). To sum up, a change in final demand for an industry's output creates an economic impact which is greater than the initial change.

Ukraine's current total of $524 bn of recovery needs includes costs that go far beyond reconstruction, ranging from demining and explosive ordnance management needs ($29.8 bn) to emergency response and civil protection needs ($2.4 bn). By contrast, the direct damage costs focus only on the needed rebuilding itself. Thus, let us assume that by the end of the Russo-Ukrainian war there is a $176.1 bn increase in final demand for construction in Ukraine, needed to re-build the destroyed and damaged housing, factories, road and bridges, municipal infrastructure, schools, hospitals and so on. The I-O analysis of this process shows that a $176.1 bn increase in final demand for construction industry (minus taxes less subsidies, equalling to $165.2 bn) leads – over a 10-year reconstruction period – to an increase in construction output by $165.2 bn net (i.e., $176.1 bn gross). This increase in construction output will create a ripple effect along the supply chain, especially, trade and repair sectors, non-metallic mineral products, basic metals, and electricity, gas, steam and air conditioning supply (for an industry-by-industry matrix breakdown, see Appendix Table 1).

Using the latest Type I multiplier figure for Ukraine's construction industry (3.60), this indirect ripple effect can be estimated to generate an additional $429.1 bn in increased output over a decade. As the construction industry's suppliers hire more workers to produce additional output, both employment and income levels rise, spurring a rise in purchases of goods and services by households, thereby creating new final demand. Using the construction industry's Type II multiplier figure (4.65), which encompass both direct, indirect, and induced effects, we can estimate the consumption induced effects to amount to $173.1 bn, with the domestic economy's output rising by $767.4 bn, in total, including the initial $165.2 bn of extra construction demand. Hence, just in pure replacement costs, to generate $159 bn in the extra GVA, leading to 9.2% of extra economic growth for each year of Ukraine's presumed 10 year-long reconstruction period.

// Building back better after the war shall become the dominant paradigm of Ukraine's recovery.

Having the necessary data, we can also measure the economic impact per US dollar or Ukrainian hryvnia increase in final demand for the construction industry's output in terms of the additional amount of gross value-added (GVA) generated and, with additional calculations, of GDP. Using the construction industry's Type II GVA effect multiplier (1.36), we can forecast the economic impact from Ukraine's post-war reconstruction, just in pure replacement costs, to generate $228 bn in the extra GVA, or $264.6 bn in GDP terms, resulting in 13.2% of extra economic growth for each year of Ukraine's presumed 10 year-long reconstruction period. Thus, simply by rebuilding its destroyed and/or damaged physical assets and infrastructure, over a decade, Ukraine will be able to expand its GDP by 2.3 times. It is safe to assume that other, 'normal' – non-reconstruction-related – economic activities will continue in the meantime, generating output on top of the projected average real GDP growth rate of between 9.2% and 13.2% per year. Therefore, by the end of its reconstruction, the Ukrainian economy will be much larger still, possibly quadrupling in size, and catching up with Poland's GDP per head level of economic development.

Building back better after the war shall become the dominant paradigm of Ukraine's recovery. The country's post-war reconstruction ought to unlock the potential for green growth. The ten-year process will require vast amounts of steel, which should be locally produced to stimulate economic regrowth. Rebuilding Ukraine's ravaged iron and steel industry – which produced 22 million tonnes annually prior to the war – presents a golden opportunity to harness the striking economic benefits of low-emission steel production once hostilities cease. A roadmap for rebuilding Ukraine's steel sector to be close to zero emissions by 2050 has already been drawn.[41] A robust green steel sector in Ukraine would have ripple effects across the entire economy, for instance, through stronger supply chain links. In 2021, for every $1 invested in Ukraine's basic metals industry, an additional $3.28 was generated elsewhere in the economy. If implemented as planned, by 2050, a green steel pathway would generate up to $415 billion of GVA, in total, and $164 billion worth of additional GVA compared to traditional coal-based steel-making.

This potential for a spectacular transformation of Ukraine's development trajectory will also have a profound impact on its space-economy. The most war damaged areas in the country today include the frontline provinces in the east and south of the country (Donetska, Kharkivska, Luhanska, Zaporizka, and Khersonska), in addition to the fully-liberated capital city-region (including the City of Kyiv and Kyivska). Yet, as the experience of other post-communist European Union accession states has shown, over time, the economic centre of an accession country inevitably shifts westwards, closer towards the largest and most affluent markets of Western Europe. As housing, transport, power generation, productive industries, schools, and hospitals are being repaired and built anew in the post-war Ukraine, it is vital for these recovery efforts not to concentrate only on war-ravaged localities in proximity to Russia. In a ten-years' time, the new economic geography map of Ukraine will bear little resemblance to its 2021 edition, let alone, the 2013 one.

Agriculture

Richard Ragan & Craig Browne

Wrapped up to ward off the bitter winter wind, Maryna gives up a wry laugh while remembering the past three years. Hugging her jacket tightly she looks out over her farm, which lies just outside of Mykolaiv City, part of Ukraine's rich agricultural territory.

Large parts of the Mykolaiv region in southern Ukraine were quickly occupied by Russian forces at the beginning of the invasion. Maryna had to stop growing tomato seedlings when a platoon of Russian soldiers commandeered her greenhouses for a few nights. Months later a missile landed in her field with a loud thud, the State Emergency Service of Ukraine (SESU) quickly arriving on the scene to defuse and remove the projectile. Then in 2023, the Kakhovka Dam was destroyed, flooding Maryna's farmland along with 40 other towns and villages. Maryna's story is a visceral example of how Ukrainian farmers have faced wave after wave of destruction.

According to the latest Rapid Damage and Needs Assessment by the Government of Ukraine, United Nations, World Bank, and European Union, Ukraine has suffered USD 176 billion in damage and estimated economic losses of USD 589 billion since Russia's full-scale invasion began in February 2022.[42] An eye-watering USD 524 billion will be needed for recovery and reconstruction over the next ten years, including USD 55 billion for agricultural needs. The scale is immense. The challenge is extraordinary. The way forward must be bold.

Ukraine has long been a vital organ in the global food supply, with over 400 million people around the world relying on Ukrainian food exports each year before the war.[43] It continues to be a vital provider for families across Africa, Asia, and the Middle East.

// Maryna's story is a visceral example of how Ukrainian farmers have faced wave after wave of destruction.

The country was, and still is, one of the world's largest exporters of wheat, sunflower oil, and corn; Agriculture accounted for 11% of GDP, 14% of the labour force, and 40% of exports before the war.[44] The sector plays a key role for rural economies too. Qualitative research conducted by the World Food Programme has found that in some areas 90% of administrative budgets were provided for by corporation and land taxes related to agriculture. In Ukraine, agriculture will be a key engine behind prosperity. Even in kitchens around the world, the recovery of Ukrainian agriculture could be a major step in reducing food prices.

So what needs to be done? The Government of Ukraine is already supporting farmers, including through compensation for mine clearance on farms. However, there is much that the international community can do that benefits food systems in Ukraine and globally.

We must ensure small-holder farmers and local producers are not left behind. Analysis conducted by the Kyiv School of Economics indicates that smallholder farmers have been severely affected by the war. Access to finance in areas near the frontline, known as Ukraine's "orange zone," is no longer available, and the costs of insurance and logistics are barely covered. The obvious thing to do would be to continue ensuring the mega producers have access to global markets, providing employment in Ukraine and food for dozens of countries. But, to paraphrase US President John F. Kennedy, we should support small producers because it is hard, and because it will organise the best of our energies and skills. People buy 99 percent of their potatoes and 89 percent of vegetables from within their local community. They can generate incomes, hire other locals, and provide more money through local taxation to improve their communities. Aggregation services could help farmers pool their produce and resources in order to sell at more competitive prices. Such services could also support farmers with the inevitable paper work that comes with accessing subsidies and complying with EU and other export requirements. Small-scale farming is also key for local rural employment. Supporting local communities in a meaningful and transformative way is a much more realistic and cost-effective investment, rather than a hand-out, for international players who perhaps do not have access to billions of dollars. And what an investment it could be.

// Analysis conducted by the Kyiv School of Economics indicates that smallholder farmers have been severely affected by the war.

It is worth noting that while Ukraine is a big global player when exporting wheat, the country is not so competitive when it comes to exporting wheat flour, unlike countries like Turkey. This is because millers tend to be smaller and often use old or inefficient equipment, and producing wheat flour is not particularly profitable in Ukraine. With massive investments in production facilities, integrating millers with other processing facilities, like producing bread and pasta, and focusing on fortified wheat flour, Ukraine could forge a path to prosperity in food processing.

Mine clearance is vital to the regeneration of Ukrainian agriculture. An area larger than the size of England needs to be surveyed for contamination.[45] If you visit rural Mykolaiv or Kharkiv these days, you will spot many demining teams doing their painstaking work, methodically plotting their way through barren fields. UN and bilateral humanitarian funding for international and local actors, as well as the State Emergency Service of Ukraine, is key to getting these areas back to productivity, powering local growth and recovery. And patience is key; clearing large tracts of land scattered by butterfly mines is the work of the tortoise, not the hare. Peace in Ukraine will provide an ideal opportunity for climate-sensitive and green investments. An important issue on Ukraine's pathway towards EU membership, this is about building back better. The importance of agriculture to Ukraine's economy means it is also a major polluter, particularly of nitrous oxide and carbon dioxide. Recent policy recommendations from Professors Oleg Nivievskyi and Olha Halytsia at the Kyiv School of Economics make sense as a starting point: promoting organic fertilisers, adopting techniques such as fertigation, and incentivising energy saving on farms in order to reduce CO2 emissions.[46] The necessary changes and alignment with EU laws and regulations will come with costs, which could perhaps be subsidised or invested in.

There is a clear pathway to prosperity and food security for Ukraine. Rebuilding agriculture in line with the EU accession process will require subsidies and investment, and by its nature the process will ensure the sector starts to become more climate-sensitive. There is enormous potential for creating hundreds of thousands of local jobs, generating local incomes, and transforming local communities. There is also enormous potential for investment, beyond necessary state subsidies and international aid.

Perhaps a Food for Peace model[47] could be utilised by Ukraine, whereby agricultural surpluses are sent abroad to populations in need, and trade relationships are expanded. There is already a potential template in the form of the Grain from Ukraine initiative between the Government of Ukraine and the World Food Programme.[48] As of March 2025, almost 300,000 metric tonnes of food has been transported to humanitarian operations in 15 countries, most recently Syria. Smallholder farmers could be incentivised and subsidised, while those most in need around the world benefit. There is scope to do more once peace is at hand. There is so much to be done. But we know what needs to be done. Once missiles stop raining from the Ukrainian skies, international investors have a huge opportunity. Maryna is counting on us. And so are her tomatoes.

// There is enormous potential for creating hundreds of thousands of local jobs, generating local incomes, and transforming local communities.

Transit-Oriented Development

Justin Morey

A Digital Blueprint for Recovery

In the wake of war and destruction, Ukraine faces a historic challenge. But, as the country rebuilds, a bold vision is emerging: one where digital tools, sustainable design, and human-centred planning come together to shape cities that are greener, faster to deliver, and as vibrant as they were before the conflict started.

At the heart of this effort is BDP's The Good City framework, launched together with its parent company Nippon Koei to help cities across the world become better. It brings together designers, urbanists, engineers, environmental scientists, and technologists to provide a package of services targeted at cities and municipal authorities. For Ukraine, The Good City can provide a foundation for addressing many of the complex challenges faced by modern cities. With a design vision grounded in dense, transit-oriented development, multi-modal mobility, and resilient, inclusive communities – alongside other key urban principals – it offers critical components of a future-proof urban fabric. When combined with advanced digital technologies, this approach offers not just recovery, but transformation.

Business innovation, particularly through digital construction, is fast becoming a cornerstone of Ukraine's regeneration. From Building Information Modelling (BIM) to cloud-based collaboration platforms, these tools are revolutionising the way cities can be planned, designed and built. Our own experience shows that BIM-driven methods can cut construction time and greenhouse gas emissions by 50% while slashing whole-life building costs by a third. Proof that technology can achieve both speed and sustainability.

At a city scale, The Good City calls for a range of solutions which can be tailored to the need of a city. One recurring aspect is maximising quality and value of development around public transport hubs. Transit-Oriented Development (TOD) concentrates housing, workspaces, shops and services around metro, tram or bus stops, creating walkable, high-density neighbourhoods that support vibrant local economies. In practice, this could mean masterplans for Ukrainian cities that cluster new homes, clinics, schools and markets around existing or extended transport corridors. When coupled with multi-modal networks, where people can easily switch between trams, buses, bikes and walking, these areas can form the backbone of a more equitable, low-carbon urban future.

Streets designed for people rather than cars, supported by pedestrian zones, low-traffic neighbourhoods and car barns at the periphery, reclaim public space and improve quality of life. By reducing dependency on private vehicles, such strategies also improve public health and free up land for green space and social uses.

// Business innovation, particularly through digital construction, is fast becoming a cornerstone of Ukraine's regeneration.

In Ukraine, this model could dovetail with ongoing infrastructure repair and improvements, making the most of existing tram lines and rail corridors to better connect it to Europe and unlock investment and economic activity. Transit-led growth isn't just about connectivity; it has the power to stimulate local business, reduce commuting time, and draw people back into revitalised neighbourhoods. And crucially, it makes urban life more accessible for everyone, bringing communities back together.

Digital Innovation Accelerating Urban Transformation

Digital design technologies are enabling this transformation at unprecedented speed and scale. With cloud-based platforms, architects, engineers and contractors, even those scattered across countries, can collaborate in real time on shared 3D models.

Design clashes can be identified and resolved before construction starts, saving time, material and cost. Generative design and rapid prototyping, powered by parametric algorithms and AI, allow teams to create and test hundreds of layout options for a building or district in hours. These iterations can optimise for daylight, energy efficiency, walkability or budget, giving planners and communities the ability to select the best solution with confidence.

These tools are not theoretical. They are already shaping real projects. In Irpin, just outside Kyiv, Ukraine's first 3D-printed house, a 130 m^2 residence, was built in only 58 hours. Modular construction offers similar promise. Homes, schools and clinics can be designed once, digitally, and then produced off-site in factories before being assembled on location. This approach cuts waste by up to 90% and ensures consistent quality, especially valuable in areas where local construction capacity may be overstretched.

Digital twins are another critical innovation. By creating detailed virtual replicas of cities using survey data, satellite imagery and 3D mapping, planners can simulate everything from traffic flow to utility demand, enabling smarter decisions on where to build and in what sequence. Ukraine is already piloting this approach, with digital twins helping to prioritise repairs and optimise infrastructure investment. Integrated data environments ensure that transport models, environmental assessments, building plans and citizen feedback are all connected, avoiding duplication and error. With everyone from architects to city officials working from the same digital source of truth, design becomes more coordinated and accountable.

A Human-Centred Rebuild

Yet a high-tech rebuild must still be human-centred and culturally grounded. BDP champions design processes that are inclusive, participatory and responsive to place. That means engaging local communities from the outset through design workshops, public consultations and virtual reality walkthroughs, making sure that what is built is accessible, beautiful and aligns with what people truly need. This approach creates trust, speeds up approvals, and builds lasting social capital. A digital-first process that doesn't replace the human touch, it amplifies it.

Strong partnerships will be key. In June 2024, BDP and Nippon Koei signed a Memorandum of Understanding with the City of Lviv to support major projects in rail infrastructure, hospital construction and Transit-Oriented Development. This trilateral agreement combines British design expertise, Japanese engineering and Ukrainian local knowledge, a powerful model for international collaboration. Importantly, Lviv's citizens will be directly involved in shaping these projects. Tram extensions, new clinics and neighbourhood revitalisation schemes will be co-designed with the people who will use them. This is what it means to apply the Good City principles in practice: breaking down silos, integrating systems, and placing communities at the heart of regeneration.

Lviv's role in Ukraine's recovery is especially significant. As a city bridging Ukraine and Europe, it has become a critical logistics and humanitarian centre during the conflict. Its ambitions to modernise and integrate its transportation network, spanning railway, air and public transit, are central to enhancing local and international connectivity. BDP's scoping study, developed in collaboration with Japanese and British partners, explores potential locations for a future multi-modal transport hub incorporating logistics and passenger movement. It proposes a comprehensive ecosystem connecting public transport types and unlocking opportunities for development that supports economic growth and urban renewal. Wider regeneration plans are also proposed, from industrial zones to hospitals and public spaces, the study outlines a phased approach to project development, stakeholder engagement, funding and delivery.

Planning for new places aside, Ukraine is a country known for its built history and heritage and post-war, preserving its cultural identity will be another crucial strand of recovery efforts. Reconstruction is not just about new buildings but about protecting the soul of its cities. Ukraine's architectural landmarks, like the UNESCO World Heritage Old City of Lviv, or Kharkiv's iconic Derzhprom, a bold 1920s Constructivist complex and a symbol of modernity and resilience, deserve both restoration and reimagining.

// Planning for new places aside, Ukraine is a country known for its built history and heritage and post-war, preserving its cultural identity will be another crucial strand of recovery efforts.

Derzhprom's survival through war damage stands as a testament to Ukraine's spirit. Rather than demolish or replace, cities should embed cultural memory into new development. Retrofitting historic structures with modern systems or echoing local styles in new buildings. This allows old and new to coexist. Creating a blend of heritage and innovation reinforces civic pride, fuels tourism and gives communities a sense of continuity amidst change.

By fusing digital technology, cultural sensitivity and participatory planning, Ukraine can lead the way in designing resilient, inclusive cities for the 21st century. The reconstruction challenge is vast, but so too is the opportunity. Through international collaboration, business innovation, and a steadfast commitment to The Good City principles, Ukraine has the potential to build back better: greener, smarter, and stronger.

Healthcare

Dr. Adrianna Murphy & Dr. Erica Richardson

All organizations, people, and actions whose primary intent is to promote, restore or maintain health make up a health system. There are more visible parts – the health care workforce, the places where they work, and the medical goods they use – and less visible functions – financing services, ensuring quality of care, gathering evidence to inform decision–making, and overall governance to ensure equity. All parts of the system matter. In Ukraine, all parts of the health system are under attack.

Ukrainian health care infrastructure and health workers in frontline areas have been specifically targeted. As of May 2025, more than 200 health workers have been killed since the full–scale Russian invasion began and there have been 2428 attacks on health facilities. In regions next to the frontline, health service providers are under extreme pressure as they must meet the needs of the resident population as well as people displaced from frontline areas, while also coping with daily missile and drone attacks. The targeting of basic infrastructure has left some health facilities without electricity and water. Many health care workers have had to flee, causing workforce shortages, especially in nursing. Among those health care workers that remain in the country, an estimated one in five experience the harmful effects of prolonged war–related stress on mental health.

But this attempted destruction of Ukraine's health system is only part of the story. What has emerged from Ukraine's response to attacks is a story of resilience and innovation. Ukraine cannot, and is not, waiting for the post–war period to adapt and reconstruct its health system. Health care reforms initiated in 2017, when the country was already defending its easternmost territories, created a foundation that has enabled the health system to respond flexibly during the war and continue providing essential care for Ukrainians, including the nearly four million who are internally displaced. This is the foundation on which any reconstruction efforts will be built.

The reforms fundamentally changed the way services were paid for, creating the National Health Service of Ukraine, a single health care purchasing agency. Having a single payer agency that disburses pooled resources has enabled the system to adapt financing quickly based on need. The reforms also strengthened primary care, with clinics contracted to provide universal access to a package of guaranteed services delivered by general practitioners. A strengthened primary care system has brought essential services closer to where people live, reducing the need to travel to access good quality care. In parallel, Ukraine introduced the electronic health record system "e–Zdorovya" (or "e–Health"), a partnership between government, private enterprise, and civil society. Accessible electronic records and other digital tools have enabled displaced patients to access services elsewhere in the country, thus ensuring some continuity of care.

There are many indications that these innovations are helping – assessments by the World Health Organization suggest that more than 90% of health care facilities remain operational and 90% of Ukrainians report being able to access necessary care.

Countless examples demonstrate that Ukraine's appetite and capacity for innovation in health system strengthening have not waned during the war. To address disruptions in access to care, Ukraine implemented mobile primary care clinics and pharmacies in conflict–affected regions, reaching thousands of underserved people. The national package of guaranteed services was expanded to offer more mental health services in primary care, with special attention paid to children and adolescents, and health care worker training in mental health service provision has been scaled up. Frontline facilities have developed their energy autonomy to become less vulnerable to attacks on energy infrastructure. A Ukrainian start–up is now at the cutting edge of innovation in AI–supported prosthetics, offering the promise of regained limb function to over 20,000 Ukrainians who have lost limbs in this war, and many others fighting other wars globally. The country has also commenced the process of integrating its military and civil health care systems, to benefit from the specialist strengths of both systems, facilitate continuity of care, and improve efficiency. Integration at the scale and speed being attempted by Ukraine is rare, and NATO countries are already looking to learn from Ukraine's experience. It is these innovations that will be expanded on, developed, and adapted in peacetime.

But in addition to persistent Russian attacks, significant challenges remain that have the potential to undermine the momentum for innovation in health care in Ukraine. In line with trends across Europe, the Ukrainian population is aging. The balance of health care needs had already shifted towards non–communicable diseases (such as cardiovascular disease, cancers, and mental health), but war has accelerated these trends. The health workforce is also aging, and many young people have left the country as refugees. There is a smaller pool of young people to bring into the health sector – and strong competition for labour from other sectors.

// Countless examples demonstrate that Ukraine's appetite and capacity for innovation in health system strengthening have not waned during the war.

These challenges and their potential solutions are the focus of the Lancet Commission that we are chairing on the future of Ukraine's health system. Taking the lead from our Ukrainian colleagues, our goal is to set out a bold vision for the country's health system that builds on the innovation achieved until now. This vision is not just about rebuilding what has been destroyed. We are imagining a health system that continues to dare to try new things, because it is being forced to. This will be a health system that takes advantage of Ukraine's intellectual resources – its expertise in medicine, pharmaceuticals, and IT and digitalization – and of the tenacity and creativity of Ukrainians. It will showcase new solutions to challenges shared by other countries in Europe with aging populations, health workforce shortages, and outdated infrastructure. It will be a health system that is resilient not only to the threat of ongoing attacks from Russia, but also to universal challenges – those posed by climate change, pandemics, and economic crises. This will be a health system that Ukrainians can take pride in because they deserve nothing less. But the work to achieve this health system can't wait for peacetime. Indeed, it has already started.

Leadership for Sustainable Reconstruction of Ukraine

Dr. Linda Powers Tomasso and Professor John D. Spengler

Reconstructing Ukraine after three devastating years of Russian invasion can be viewed as an opportunity as well as a necessity wrought by crisis. The Harvard T.H. Chan School of Public Health (HSPH) responded to this reality by launching "Leadership for Sustainable Reconstruction of Ukraine," an online, free-of-charge course designed to empower Ukrainian professionals across various sectors to prepare for the huge reconstruction task ahead. This semester-long initiative, which quickly attracted nearly 300 applicants for just 60 spots, drew representation from across Ukraine's ministries, academia, NGOs and civil society, charitable foundations (CSOs), law and finance, with the aim of incorporating people, environmental concerns, and infrastructure resilience into national rebuilding efforts.

Our primary objective for this twice-weekly seminar course was to expose mid-tier Ukrainian professionals to the methods and mindset of sustainable approaches to rebuild their country. A secondary objective was to fortify the leadership skills each participant will need to guide this transition in his/her respective sector. A third aim was to construct a networked cohort that crosses disciplines and domains of expertise so that participants can call upon one another for professional support and collaboration in years to come.

To realize these objectives, we drew on the expertise of Harvard Chan faculty members (healthy buildings, climate and health), as well as other Harvard schools (Graduate School of Design, Harvard Kennedy School, the Sustainability Program at the Department of Continuing Education) to augment a curriculum based around policymaking, public-private partnerships, green energy, climate resiliency, decarbonization, trauma-informed design, and the use and remediation of urban environments. The program also addressed pressing issues highlighted by attendees, such as ethics and institutional integrity, and the integration of site-specific green energy solutions, providing much-needed perspectives on Ukraine. The U.S. Green Building Council actively partnered with HSPH and underwrote parts of the course. The USGBC sponsored and organized two in-person gatherings for Fall 2024 course participants in Kyiv to support cohort networking opportunities, one of which was a final graduation ceremony. The USGBC also provided free access to their educational catalogue for accepted and deferred course applicants.

An ancillary outcome reflected the course's hybrid format through the creation of active Affinity Groups responsible for delivering thoughtfully constructed final projects specific to Ukraine's reconstruction needs. Participants drew on their sectoral expertise to form interdisciplinary teams reflecting course content, applying their learning to integrate sustainable practices into their professions. These interactive sessions and Affinity Group projects led by Harvard experts and global leaders resulted in several visionary blueprints of a caliber that is attracting institutional funders.

Among our participants were several university faculty and rectors primed to commit their institutions to a sustainable transformative of Ukraine. One professor in Ukraine, noting that much of the country's infrastructure is outdated and inefficient, hopes to employ lessons from the course to improve schools, clinics, and housing. Similarly, another participant found the course invaluable in his work on zero-waste initiatives, leveraging the networked cohort it provided.

Following the course's conclusion, participants from this first cohort have banded together to produce concrete, on-going, independent work. For example, 18 members of the Fall 2024 cohort have formed a community of practice to outline policies and guidelines for new community development. Currently this group is exploring a case study to work on as a team, with each member bringing their expertise to the analysis. This community next plans to identify grant opportunities to pursue collectively toward practical applications of sustainability. Other course participants have produced three separate documents to build small prototype multi-purpose new communities shaped by sustainability. For example, one course participant who is a professor of engineering is guiding a community currently powered by district heating to explore ways to replace its coal-fired power with a geothermal plant and other renewables funded by Green Swaps.

Further, the WhatsApp group from the 2024 cohort remains very active 4 months after course completion. A research collaboration between Harvard's Dr. Linda Tomasso and a Ukrainian course participant, Dr. Olya Fokaf, is investigating coping mechanisms for stress reduction under wartime. Dr. Fokaf remarks on her learning invoking a common MO among participants: "Ukraine's reconstruction must be based on long-term resilience rather than short-term fixes. It's not just about building back better, but *building forward better,* ensuring that what we rebuild is stronger, more inclusive and better prepared for future challenges."

The course was not only educational but also signified an important gesture of solidarity with Ukrainians dedicated to the task of reconstruction. Student testimonials attest to the effectiveness of this approach:

- *"In many ways, this course was remarkable – bringing together practitioners, researchers, and civic leaders across disciplines and countries. For several of us, the experience sparked continuing collaborations and renewed commitments to public service and global engagement. As testament to that momentum, our Affinity Group is still working together and planning to develop a number of academic articles, publications, and a practical toolkit for entities seeking to incorporate community-driven development into their reconstruction and recovery strategies. That continuity is itself a reflection of the course's success."*

- *"You didn't just select participants, you curated a symphony of minds. Each session felt like jumping into the deep pool – but instead of drowning, we discovered we could swim faster, better, together. What did we tackle? Everything that will shape Ukraine's tomorrow."*

A sample participant-led project which emerged from the Leadership for Sustainable Reconstruction of Ukraine course outlines a seven-year cycle for restoring an aging factory community around sustainability markers.

KPIs by End of Year 2
- Energy: Install pilot solar farms or wind turbines pilot projects to supply 10% of local needs.
- Workforce Development: Train 500 individuals per town for green jobs in renewable energy installation, maintenance, and related skills.
- Entrepreneurship: Distribute €2 million in microloans and business grants to support small businesses in agriculture, services, or renewable energy, with at least 50 new businesses launched.
- Citizen Retention and Engagement: Reduce outmigration by 15%.

Scaling up annually and expanding coverage would result in Year 4 sectoral achievements:

1. **Policy Implementation:**
   - Energy: Renewable energy covers 50% of local needs and mandate renewable energy for 50% of municipal buildings.
   - Introduce policies for circular economy practices, such as recycling incentives.
2. **Workforce and Citizen Support:**
   - Expand workforce retraining programs, aiming for 80% green job employment for displaced coal workers.
   - Entrepreneurship Growth:
     - Increase grants and loans by 50% for high-growth potential businesses.
     - Facilitate export opportunities for green businesses through trade agreements.

Years 6 and 7 aim to institutionalize changes and make them self-sustaining by shifting the focus to scaling up successful initiatives, refining policies, and ensuring the economic and social stability of transitioned company towns.

Encouraged by the response and forward-looking initiatives which sprang from this initial course, we will continue to support Ukrainians in their initiatives to change policies, regulations, codes, procurement practices while curating a workforce of younger professionals. A Fall 2025 Leadership course curriculum will again be dedicated to teaching Ukraine's next generation leaders about sustainability principles, decarbonization, and health promotion for a country traumatized by war, with an intensified emphasis on case-studies. The course's new iteration will incorporate knowledge co-creation and applied learning for a new cohort of Ukrainian professionals, continuing crucial areas of environmental sustainability that include low-carbon infrastructure, renewable energy, resilience planning, and green building standards.

Several participants from the Fall 2024 cohort will serve as co-instructors and section leaders of the Fall 2025 course. The prototype community designs put forth by members of this first cohort will serve as applied learning examples around which 2025 Affinity group members can self-select based on areas of experience, e.g., finance, renewable energy, sustainable building codes, life-cycle assessment, to advance the development of these proposals. Knowledge of the course material gained by the Fall 2024 cohort and on-the-ground connections to Ukrainian reality will help unite theoretical material with the ongoing transformation of Ukraine's built environment and civil society. Having actionable blueprints developed by our 2024 cohort will allow for the intentional application of sustainability on sites already ripe for redevelopment.

As course leaders, we detected restlessness by the younger generation for change at the higher decision-making levels, an assertiveness that defies the practices of a previous generation, and a certain intolerance for institutional intractability. Digitalization, an anti-corruption push, green/sustainable focus, social responsibility, and entrepreneurial liberty instead define the interests of these emerging leaders. For these reasons, teaching changemaking at a time Ukraine simultaneously consolidates its national identity and confronts the aftermath of invasion creates an historic opportunity to recast the country's future as modern, green, independent, and resilient. It is our privilege to participate in the process.

Business spotlight

AICHITECT

The reconstruction of Ukraine represents both an immense challenge and an unprecedented opportunity. The scale of destruction necessitates rapid, smart, and inclusive solutions. Artificial Intelligence (AI), and specifically tools such as AICHITECT, offer critical support for delivering a robust digital infrastructure to underpin this rebuilding process. By aligning national ambitions with local needs, AI can enable Ukraine to develop cities that are not only resilient but equitable, sustainable, and efficient. AI can be a key enabler across multiple dimensions of Ukraine's reconstruction. Ukraine's post-conflict urban development requires a new approach, one grounded in empowerment, inclusivity, and innovation. From trauma recovery to strategic infrastructure delivery, digital tools will be foundational. AI offers a new paradigm in which complex processes become more transparent, collaborative, and responsive to both local and national priorities.

// With Ukraine under pressure to double its productivity, AI becomes essential to enable high-speed yet thoughtful development.

Reimagining Reconstruction Through AI

AI is not a replacement for human insight but a tool that augments it. As demonstrated by AICHITECT, AI can deliver rapid legal compliance checks, automate routine design validation, and streamline construction planning. With Ukraine under pressure to double its productivity, AI becomes essential to enable high-speed yet thoughtful development.

In multi-level governance and planning, AI enables national and local governments to harmonise development priorities and policy implementation. Tools like AICHITECT can deliver insights within hours, replacing processes that previously took weeks. This includes reviewing design guides, checking compliance, and conducting site feasibility analysis. AI-driven platforms can help mitigate fragmentation risks by creating shared standards and interfaces across municipalities.

Community-Led and Citizen-Powered Development Cultural and Environmental Contextualisation

The healing process is not just psychological—it is also spatial and social. AI can empower citizens to contribute to project design and oversight. Through interfaces for community feedback, co-design initiatives, and citizen-led builds, technology can create channels for bottom-up urbanism. Localised projects gain legitimacy, increase buy-in, and accelerate community reintegration.

// The work of AICHITECT demonstrates that technology, when designed to augment and democratise, can play a profound role in reshaping urban life.

Cultural heritage and environmental resilience must shape Ukraine's future cities. AI can assist with preserving historic data, creating 3D models, and integrating community narratives into planning. Digital twins can simulate climate impacts, supporting decisions around rainwater harvesting, heat mitigation, and green infrastructure.

Ukraine's recovery must address both skill shortages and equitable access to knowledge. AI training platforms can guide builders, volunteers, and citizens step-by-step. By providing access to international expertise through digital platforms, AI also allows local teams to engage with global leaders in sustainability, fire safety, and resilient design without leaving their cities.

Materials, Certification, and Innovation Gaps Monitoring, Quality Assurance, and Rapid Feedback Loops

A key bottleneck in reconstruction is the certification and use of new or recycled materials. AI can fill this gap by rapidly generating digital standards and guides, aiding compliance and adoption of bio-based or non-traditional materials. Platforms can help track availability, suitability, and performance data, helping regulators and builders make informed decisions.

Quality control is often constrained by lack of resources or time. AI tools can continuously capture site progress, flag non-compliance, and facilitate inspections remotely. Real-time data enables dynamic updates, reducing the lag between issue detection and resolution. In volatile contexts, this responsiveness is not a luxury but a necessity.

Building the Tech-Enabled Recovery Ecosystem

The UK-Ukraine Tech Bridge and similar partnerships represent an exciting avenue for innovation. Pilots such as METALAB's Co-Haty project demonstrate the value of developing solutions locally that meet grassroots requirements not easily known internationally. To truly scale AI's impact, platforms must remain open, adaptable, and context-sensitive. The involvement of venture capital, international expertise, and grassroots actors will be key.

Conclusion

AI presents a transformative opportunity to rebuild Ukraine with speed, intelligence, and compassion. The work of AICHITECT demonstrates that technology, when designed to augment and democratise, can play a profound role in reshaping urban life. Now is the moment to embed AI as a core pillar of Ukraine's recovery, ensuring that digital infrastructure reflects the people, place, and promise of a renewed nation.

David Adjei – CEO of AICHITECT

Biohm

Regenerative Reconstruction as a Stepping Stone

Before bridges became the complex engineering marvels we know today, a bridge was a stepping stone. Stepping stones operate at many scales: a step to get from A to B but also at evolutionary scales, where one step unlocks transformative change that reverberates across millennia. The ancient Cucuteni–Trypillia culture is one such stepping stone. In the Eastern European steppes and contemporary Ukraine, Neolithic peoples developed some of the earliest proto-cities humanity has known comprising of thousands of housing complexes and inhabitants.

There is a strange anomaly at Cucuteni–Trypillia sites: some archaeologists theorise that settlements were routinely and intentionally burned by inhabitants, signalling the end of a settlement's 'life' and an opportunity for renewal.[49] Reverberations of this enigmatic practice are found across contemporary Ukrainian reconstruction practices, such as Livyj Bereh's roof repair initiative[50] which breathes new life into damaged homes. These adaptations are situated within local conditions and needs and demonstrate how repair can keep materials, skills, and decision-making close to home. As Ukraine enters new terrain in its reconstruction efforts, national accountability and scale are needed to address both local needs and international incentives and influence.

// With Ukraine under pressure to double its productivity, AI becomes essential to enable high-speed yet thoughtful development.

Regenerative Repair

Regenerative reconstruction begins by questioning our assumptions about damage and waste. In nature, decay is the spark of a new beginning. At Biohm, we apply this principle to (re)construction by mimicking nature's processes: breaking down complex matter into its simple building blocks, which are then reconstructed for a new application. We use this to turn a wide range of agricultural and industrial waste into high-performing bio-based materials that rival advanced synthetic alternatives, as demonstrated in Terraphyll, Biohm's leading insulation technology. Through scientific and technological transformation, waste is not a burden to discard, but a resource to transform.[51]

The refrain that Ukraine is Europe's breadbasket has followed the nation across this war. It has served to both help and hinder international support and resilience. Waste streams from existing economic outputs, like that from wheat harvesting, can be transformed into the building blocks for new homes, jobs, and positive environmental impact, thus reducing the need for imported and costly petrochemical based materials.[52]

Likewise, promising developments targeted at processing rubble[53] into concrete show potential for transforming construction waste into materials for new homes. Embedding bioremediation technologies within such manufacturing processes would ensure these recycled materials are uncontaminated and safe and that reconstruction is not only economically driven but also supports the health of human and ecosystem life.

Furthermore, processing infrastructural waste into new building materials can address the spectre that Ukraine's most affected areas become 'sacrifice zones'.[54] This is especially crucial to curb the risk that Western regions may disproportionately benefit from closer alignment to the EU while Eastern regions risk being left behind – fuelling further fragmentation and threatening national and European regional resilience.

Hyper-Localised Regeneration and National Resilience

Spiral Dynamics, a framework that describes a model of cultural evolution, suggests that peace doesn't arise from uniformity but from understanding how different worldviews co-evolve. The future of Ukraine's reconstruction will be influenced not just by what, and how, rebuilding happens, but by whom. It is crucial that reconstruction champions plural identities, complex histories, and divergent values whilst signalling to those who have left that reconstruction presents opportunities for prosperity within Ukraine.

As such, rather than imposing strict nation-wide solutions, international partners can work with government to incentivise hyper-local regeneration and innovation. Being attentive to feedback loops in regeneration programmes ensures that what is learned or developed locally informs policy and funding at higher scales, and vice versa. Hybrid financing structures, revolving funds, and profit-sharing in local production can ensure resources circulate within communities and that reconstruction fuels long term local and national autonomy.

Such a transformation is not always possible within existing financing models. The source, terms, expectations, and conditions attached to capital deployment will ultimately shape the pace and outcome of reconstruction. Vision alone will not deliver transformation if funding mechanisms incentivise speed over sustainability, or short-term return over long-term resilience. Regenerative strategies often require slower timelines, iterative development, and community participation – qualities that do not always align with conventional investment logics.

Yet, because Ukraine's reconstruction represents one of the largest infrastructure and development opportunities in a generation, it is crucial that we collaborate to show that things can be done differently. Models that prioritise hyper-localisation, profit-sharing, and anchor financing in local ownership can help align regenerative aims with financial viability and long-term resilience.

In this sense, financing is not just a constraint but a design question. If approached with care, it can become a tool to support the kind of decentralised, durable, and adaptive reconstruction Ukraine deserves.

Dr Ehab Sayed, Harry Darkly, Marina Ionita – Biohm

Kotsiuba

Landscape as a Tool for Recovery

The war in Ukraine has damaged more than infrastructure. It has altered the way people live in cities – disrupting connections between people, place, and memory. Recovery must go beyond physical reconstruction. It needs to help communities process loss, create new meaning, and rebuild spaces where people can be together again.

At KOTSIUBA, we don't see landscape as decoration. For us, it's a way of thinking about space as a living structure – shaped through the interaction of people, context, and time. We understand public space as a vessel of memory and a language of care. Our projects shape new urban environments where nature, memory, and human connection work together.

On 14 July 2022, a Russian missile struck Peremohy Square in Vinnytsia, killing civilians – including children. Before the attack, we had already won the city's design competition to reimagine the square. After the tragedy, the city initiated an open workshop. Together with families of the victims, community members, architects, and officials, we reconsidered what this space should become.

What emerged was the idea of a living memorial – not a separate monument, but a space where memory is embedded in the environment itself: in the paving, the lighting, the trees, even in the visible traces of the explosion. This space does not isolate trauma – it allows memory to be part of daily life. The idea was supported by workshop participants and formally approved by the city as part of the updated design. At the same site, prior to the full reconstruction, the victims' families placed a memorial – a sign that memory is already present in the space.

This experience showed how recovery involves more than changing form – it means changing meaning. The square became a shared space that reflects trauma, dignity, and a collective step forward.

In Chernivtsi, we are redesigning the central square, now divided by a wide road and disconnected from civic life. Our project transforms it into a fully pedestrian, inclusive, and green public space – a place for gathering, reflection, and rest. It restores a human scale and expresses care for everyone who lives there.

The city has become home to many displaced people. What matters most is that they are actively involved in shaping its future. People who have experienced loss, returned from the front, support loved ones, or await those who won't return – together with other residents, they are shaping a new urban reality. We work with the whole community – supporting a process where participation creates belonging, connection, and rootedness.

Near the square stands a memorial to the fallen soldiers of Bukovyna. In the new plan, it becomes part of the civic story – not separate, but integrated. It reflects respect for those who carry trauma, those who grieve, and those who offer support. And for a city that expresses this respect through action.

In Zhytomyr, Poltava, and Kyiv, we worked with central squares shaped during the Soviet period. These spaces were designed for parades, mass gatherings, and political demonstration – not everyday life. They lacked human scale and any connection to local identity. Rather than restore them in a traditional sense, we collaborated with local communities to rethink their purpose and discover a new language for public space. As shown in our short film 'Rethinking the Future Out of a Totalitarian Past', landscape architecture can transform these places – from imposed structures into meaningful, interactive parts of urban life.

At UNIT.City – an innovation district built on the site of a former factory – landscape defines the new urban environment. Forest-like plantings, green buffers, and layered vegetation shape microclimates and encourage interaction. Tree shade, clean air, and noise reduction are not added features – they are foundations of urban quality of life.

We also integrated rain gardens and sustainable drainage systems. The public realm includes walkable streets, open plazas, and learning spaces – places to gather, think, and rest. The project sets new standards for urban space – shaped to respond to climate, community, and contemporary challenges.

Most of our urban projects are co-created with communities: through consultations, workshops, and open dialogue. We don't just listen – we build with people. Implementation also involves local makers and small businesses. In difficult economic times, this kind of collaboration builds relationships, creates jobs, and restores trust.

Recovery is not about returning to what was. It means creating a new urban experience, rebuilding connections, and shaping shared forms of care. The future doesn't arrive on its own – it is made. Together. Starting now.

Maksym Kotsiuba, Founder and Lead Landscape Architect

// Near the square stands a memorial to the fallen soldiers of Bukovyna. In the new plan, it becomes part of the civic story – not separate, but integrated.

Vertical Future

At Vertical Future ("VF"), we develop and deploy sophisticated, integrated engineering solutions for indoor crop production. Supported by a historical and ongoing stream of data and crop science, we design and build vertical farms for growers, retailers and real estate developers, among others, bringing hardware, software, plant science and project management know-how to bear on assignments co-developed with and commissioned by clients.

We have experience with a range of relevant use cases, including commercial production of fresh leafy greens, berries and herbs, plant nurseries to grow seedlings of horticultural crops and tree saplings for transplanting and cultivation to maturity in greenhouses and open fields, experimental production of food crops and nutraceuticals to study yield and quality responses to different, tightly controlled environmental specifications, and "autonomous agriculture for space" research where we have partnered with the UK Space Agency and AXIOM Space to test plant and food production systems for a Low Earth Orbit deployment, scheduled for 2027.

Since founding the company in 2016, we have evolved from being the leading growers in London to pivoting to integrated, data-driven, technology development (including manufacturing and fabrication), recognizing a clear gap in the market. Along the way, we've received numerous national and international awards; are Global Innovators in the World Economic Forum; members of the World Green Economy Association, on the Board of the Controlled-environment-agricultural ("CEA") Alliance and have built networks (mainly through winning grants) with many academic and science-led organisations.

Vertical farming cannot replace conventional (open field) agriculture in full due to the (current) crops that can be grown at price-parity, but it can efficiently produce certain types of crops near consumers (eliminating imports) that are important for health, nutrition and food security – year-round, pesticide-free, and with an incomparably low land and water use footprint. With so much effort needed, I think this could potentially be of interest in a reconstruction context in Ukraine.

Ukraine is a major producer of food and feed grains and oil seeds for domestic and world markets and, again, vertical farming is not relevant to the great coming task of rehabilitation of people, fields, institutions, infrastructure and equipment for broad acre farming in the country. But vertical farming (and potentially other forms of CEA such as greenhouses and roof-top aquaculture and farming) could very much be a resource and method of interest in urban and rural reconstruction – for at least three reasons.

// We have evolved from being the leading growers in London to pivoting to integrated, data-driven, technology development.

First, vertical farming can offer a measure of local control over food and agri-food related employment and value creation, primarily through establishing large-scale, efficient farms in peri-urban or rural areas. Local government and communities are interested in a reliable supply of food, welfare, healthy diets, and job creation. Vertical farming can be part of the mix of a food system that achieves this in decentralised, modular fashion. The technology and underlying crop and data science to make this work exists, yet it is up to local leadership, business decisions and investment to make it happen.

Second, vertical farming is innovation-intensive and as such could fit in well with some of the tech-savvy innovation eco-systems for which Ukraine has deservedly become famous for in recent years. Vertical farming is part of the future of sustainable agriculture and food in a world in which supply disruption threats due to war, trade, water, weather and climate challenges are intensifying. Innovation is what is feeding the world, as the people of Ukraine know perhaps better than anyone else. Vertical farming is a potentially potent tool for food and nutrition security that (along with others) should not be ignored in attempts to build back better for efficiency, equity, resilience and sustainability.

Third, whilst vertical farming is best suited for large-scale developments that can realise economies of scale and better purchasing power in aid of bringing down food prices whilst at the same time, delivering higher-quality national produce, there is also an urban angle for smaller vertical farms, which can act as “spokes” from the beforementioned larger “hubs”. These smaller urban farms can facilitate learning, job creation, community cohesion, and educating people of all ages about the importance of nutrition, climate change, and food waste, amongst many other topics.

// Vertical farming can offer a measure of local control over food and agri-food related employment and value creation, primarily through establishing large-scale, efficient farms in peri-urban or rural areas.

As the recognised global leader in CEA, VF can support the efforts to rebuild and rejuvenate Ukraine through deploying a series of solutions – from both high-tech to more standardized vertical farms – deployed in both rural and urban areas, aligned with the geographical and population-density-driven needs of Ukraine. Through the support of the U.K. government, we would aim to work with the Ukrainian government to seek requisite funding to aid in rapid deployment.

Our end goals include food and water security, the creation of a new industry (and jobs), and long-term prosperity for a country that has been invaded and at war for too long. We stand by ready to support.

Bryden Wood

An integrated reconstruction approach to maximise the mutual benefit of interrelated technologies, the resultant effect of which is greater than the sum of the parts.

The motives of parties involved in Ukraine's reconstruction will be an amalgam of benevolence and national or commercial self-interest. There will be intense and often imbalanced pressures to develop new and existing industries for the benefit of external parties making resilient masterplanning for post-war reconstruction imperative.

The degree of interaction and inter-dependency of new technologies renders historical models of post-war reconstruction no longer relevant.

// The motives of parties involved in Ukraine's reconstruction will be an amalgam of benevolence and national or commercial self-interest.

The location of interoperable technologies is often dictated by proximity to cooling water, raw materials, or labour. Ukrainian reconstruction, however, offers the opportunity to accelerate the growth of new and existing technologies by carefully conceived clustering of mutually beneficial technologies and infrastructure.

A system illustrating how technologies are related and dependent – analogous with a taxonomy – should form the basis of a masterplan for the reconstruction and growth of infrastructure and technology. A newly conceived plan for industrialisation can be inherently more resilient and take advantage of miniaturisation, automation, and distributed energy sources.

The origin technology is invariably energy generation. But the kind of energy, and how close energy-dependent technologies can be to it, will have a profound effect on viability and progress.

Geographical clusters of technologies interconnected by appropriate infrastructure should follow a hub-and-spoke network principle – where primary initiating technologies (e.g. power production or biomass gasification) are surrounded by complimentary technologies (e.g. sustainable aviation fuel refinery).

The more foresighted this new hub-and-spoke masterplan for technology and industrial growth, the more successful Ukrainian reconstruction will be.

Moreover, reconstruction provides an opportunity to upgrade Ukraine's industrial base to include a higher proportion of leading-edge and post-hydrocarbon technologies including bio-fuel refining, rare earth mineral processing, and large and small molecule pharmaceuticals.

Key to the success of any low-carbon, high-technology economy is the rebuilding of energy infrastructure to provide a plentiful and reliable supply of zero-carbon electricity and high-grade heat.

Subject to suitable investment, Ukraine possesses the intellectual property, skill base, and uranium deposits to develop its existing nuclear power industry to include the rapid and phased introduction of third- and fourth-generation modular nuclear fission heat generation.

// Ukraine has a unique opportunity to 'back many horses' in the global race for a decarbonised economy.

Careful co-location of industries requiring a mixture of high-grade heat and electrical power could increase the proportion of power used at source, reducing reliance upon the often unavoidably protracted upgrading of the electrical grid.

The choice of energy technologies is a key consideration. Ukraine has a unique opportunity to 'back many horses' in the global race for a decarbonised economy. For example, 'new nuclear' SMRs currently under development vary greatly in cost and efficiency. The small modular nomenclature refers to the reactor being transportable and therefore capable of factory manufacture. The market's initial inability to define precise 'value drivers' for SMRs, has resulted in an unnecessarily large number of different potential solutions.

Balanced by a network of distributed sustainable energy sources and storage, Ukraine could opt for SMR technologies with a lower cost per KW/h and high-power density to ensure both the low carbon profile and competitiveness of its energy infrastructure.

With so much of Ukraine's existing power infrastructure damaged or destroyed, a carefully conceived energy blueprint that balances future economic needs with acceptable levels of safety and minimum of environmental damage, is the first step.

Accelerating reconstruction and growth through the application of design and construction standardisation.

Standardisation is the universal precursor to efficiency and effectiveness in manufacturing. Why then, when applied to construction, has standardisation often failed to deliver similar benefits?

If manufacturing efficiency, rather than traditional construction practices, is to drive Ukraine's reconstruction, an improvement on historical examples of construction standardisation is required.

The manufactured components used for reconstruction will already be subject to high degrees of standardisation. Steel will be from a limited range of profiles and sizes; rebar to diameters and grades; pipes and cables to specific dimensions.

The standards to which the design of infrastructure and buildings conform, however, are little influenced by component standards.

For example, most residential concrete-frame buildings defeat attempts at efficient standardisation by incorporating extremely similar – but marginally different – structural spans.

Martin Wood – Bryden Wood

// Ukraine has a need to quickly develop the use of well-conceived standardisation if rehousing and healthcare objectives are to be met.

Moreover, historical construction contracting offers little advantage to either designer or client for adherence to standardisation. Without a cost, time, or quality benefit being proffered why would designers or client feel the need to comply? There has developed amongst designers a view that design standardisation limits creativity and freedom for little tangible gain. The result is a built environment formed from individual projects that although often similar, are frustratingly different at a construction level. The true cost of this handcrafted environment in developed economies is high and often masked when development is organic and incremental.

Ukraine has a need to quickly develop the use of well-conceived standardisation if rehousing and healthcare objectives are to be met. The standardisation hypothesis is not new and has been applied intermittently during the 19th and 20th centuries with highly variable outcomes. How then can rebuilding Ukraine take the advantages of cross-sector standardisation without force fitting repetitive building typologies?

While an increased use of factory-fabricated modular construction may provide rapid early wins, mid- and long-term urban development success can only be achieved by applying a Ukrainian variant of a construction platform system for housing and social facilities.

The key objectives of a construction platform system are to radically improve site labour productivity by using an assembled kit-of-parts. The more successful the efficiency of assembly and the standardisation of supply chain demand for these parts, the more successful the platform.

In the UK, government attempts to introduce platforms through initiatives (e.g. 'Transforming Infrastructure Performance: Roadmap to 2030') have had limited uptake due to a lack of necessity to change, the Ukrainian imperative is far greater. Building with platforms requires designing with platforms, and therefore the embedment of platform rules and principles into the digital design tools used by the designers tasked with designing the 'new' Ukraine.

Designing with Digital foresight – the extensive use of digital design simulation and digital twins.

Ukraine has a globally significant digital simulation capability. The development and effective control of a new technological masterplan must be underpinned by a digital strategy that includes the extensive use of design simulation and digital proxies for physical assets and operating systems (typically referred to as 'digital twins').

Digital twins begin at a conceptual masterplanning stage and develop in parallel to physical, technological assets such as energy plants and production facilities, providing critical ongoing feedback for the techno-economic modelling required to ensure successful outcomes. From early plans will emerge projects, throughout which digital twins assist with program control from conception through commissioning to operation.

A carefully structured and integrated digital masterplan will provide invaluable insight to ensure a myriad of well-intentioned reconstruction initiatives result in a 'new' Ukraine with a technologically sustainable economy greater than the sum of its parts.

GreenBlue Urban

Supporting Ukraine's Post-War Development through Green and Blue Infrastructure

Ukraine faces an immense challenge to reconstruct its cities and communities, reshaping the nation's urban landscape for decades to come. Green and blue urban infrastructure – which combines trees and plants with water management systems – provides a more sustainable approach to rebuilding. Ukraine can look to be regenerated, not just reconstructed, creating urban environments that are more sustainable and liveable.

By prioritising green-blue infrastructure, Ukraine has an opportunity to transform war-affected cities into models for climate resilience and social connection. Successful implementation requires early integration and planning processes that engage local communities, ensuring reconstructed spaces meet actual needs rather than ideals. Pilot projects in diverse settings could also be used to demonstrate the effectiveness of sustainable infrastructure prior to scaling.

As the inventor of the soil cell, GreenBlue Urban has pioneered this technology for over 30 years. We collaborate with local governments, research institutions, developers, and design professionals across diverse urban contexts to understand effective real-world applications. Our extensive research data and case studies ensure that Ukraine can implement proven solutions that deliver climate-resilient cities that also prioritise the wellbeing of citizens.

// We collaborate with local governments, research institutions, developers, and design professionals across diverse urban contexts to understand effective real-world applications.

Green

Urban environments dominated by hard, impermeable surfaces challenge tree health and growth. Modern soil cell systems create optimal conditions for trees to thrive even during dry periods while protecting surrounding hardscapes. When installed alongside blue infrastructure, these complementary systems help create resilient cities that work with, rather than against, natural processes.

This approach to enhancing climate resilience is crucial for urban areas facing changing environmental conditions. Green infrastructure can help cool urban areas by as much as 2-8°C, providing shade and mitigating the urban heat island effect. Strategically planting trees throughout rebuilt cities can lower ambient temperatures and improve air quality.

Blue

Considering the creation of a 'sponge city' in Ukraine could also be timely. This concept emphasises designing urban areas to prioritise the management of rainwater through nature-based infrastructure. By integrating parks, green roofs, raingardens, and permeable pavements, these cities can absorb and store rainwater effectively. This approach mimics natural water cycles, reducing the risk of flooding and improving water quality.

As climate change increases water stress, integrated rainwater management systems in public spaces will help conserve vital resources. The reconstruction effort can transform public areas into multifunctional spaces that serve recreational purposes while helping retain water during extreme weather events. Tree planting systems effectively capture and store stormwater, filter silt and debris, and provide irrigation for trees. The modular design allows adaptation around below-ground constraints like utilities, enabling a high degree of customisation to suit specific tree species, water storage requirements, and location needs – ultimately building urban resilience against flooding.

Implementation

Embedding green and blue infrastructure at the earliest stages of planning is fundamental to creating sustainable urban environments. This proactive approach ensures that nature-based solutions help shape the development of public spaces that enhance urban liveability, rather than appearing as retrofitted elements. Cities planned with integrated green spaces, strategic water management systems, and connected ecological networks foster stronger community engagement with public spaces, improve physical and mental wellbeing outcomes, and establish climate resilience as a foundational characteristic rather than an afterthought.

Sustainable infrastructure investments could also stimulate economic recovery while creating much needed jobs for Ukrainians. Training workers in green construction techniques can help to upskill the current workforce to be better prepared for the reconstruction effort while building capacity for sustainable development long-term. Incorporating sustainable infrastructure into projects could also stimulate economic growth, supporting community resilience and local businesses – like tree nurseries and construction companies – during rebuilding phases.

Conclusion

During the process of recovery, both for communities and nature, planting trees throughout rebuilt cities can have many benefits. The mental health benefits of access to natural environments are well-documented and access to green spaces correlate with reduced stress levels and increased physical activity. Trees also encourage increased biodiversity in urban areas, including birds and insects, which have also been shown to have stronger improvements in mental wellbeing compared to spaces with less natural diversity.

By integrating nature-based solutions into reconstruction plans from the planning stages, Ukraine can address immediate recovery needs while building long-term resilience. Green and blue infrastructure represents not just a technical approach but a vision for Ukraine's sustainable future, one where cities are not just rebuilt, but fundamentally improved, creating communities that honour the past while facing future challenges.

METALAB

Rebuilding Ukraine Through Housing Innovation and Emerging Enterprise Partnerships

The devastation of Russia's full-scale invasion has left millions of Ukrainians without homes. But beyond the immediate crisis lies an opportunity – and a responsibility – to rebuild in a way that not only restores, but transforms. In the housing sector, this means moving away from outdated, top-down models towards people-driven, sustainable solutions. Innovation in this context is not optional – it is essential.

CO-HATY is a non-profit housing initiative launched by the Ukrainian urban laboratory METALAB in 2022. What began as an emergency response to war-induced displacement has since grown into a wide-reaching programme developing long-term housing solutions for people displaced by war. Today, CO-HATY is pioneering new models of affordable, community-led housing in western and central Ukraine. In 3 years the team retrofitted over 7 dormitories into temporary stay shelters for more than 1500 IDPs and started 3 piloting projects of long-term social and affordable housing.

We aim to create housing that is dignified, sustainable, and community-owned – housing that heals, not just shelters. Our work challenges the dominant approach to reconstruction, which often centres on state-led or private market mechanisms. While these actors are crucial, we believe Ukraine also needs legitimate tools for non-profit housing development, where civil society can directly contribute to building the housing stock.

What Housing Innovation Can Offer Ukraine

The traditional housing development model in Ukraine, heavily centralised and market-driven, has proven inadequate in times of peace – and catastrophic in war. It is time for a new paradigm.

Our approach offers three major innovations to guide this shift:

1. **A new housing logic:** We focus on adaptive reuse – turning underutilised buildings (such as dormitories or former municipal facilities) into high-quality homes. This reduces environmental impact, cost, and construction time. This approach is often more flexible compared to new construction. It also strengthens local ecosystems by reviving abandoned infrastructure.

2. **People-powered design:** Future residents – primarily displaced people – are involved from the outset in shaping their homes and communities. From participatory planning workshops to resident-led management models, we treat residents not as beneficiaries, but as co-creators. This builds community, not just housing.

3. **Sustainability as a foundation, not an add-on:** Working with POLE, Center for Research and Product Design, we integrate eco-materials and energy-efficient systems into our construction process. Our prototypes include bio-based insulation, modular timber structures, and circularity-based approaches – adapted for the Ukrainian context.

These innovations are not theoretical. We've implemented them in Ivano-Frankivsk and other western and central Ukraine regions, delivering housing for displaced communities and proving that alternative models are viable, scalable, and socially rooted.

The Role of Emerging Enterprises in Scaling Innovation

Ukraine's reconstruction will require the involvement of a wide range of actors – and we believe that emerging enterprises are uniquely positioned to drive the transformation our housing sector needs.

In our work, we've seen how material innovators, design collectives, and energy startups can bring creativity and agility that larger institutions lack. These enterprises are not just service providers – they are co-authors of systemic change.

For example:
- A Ukrainian start-up co-developed bio-based insulation prototypes, which is preparing for certification to be used in our collective housing retrofits
- A local SME piloted solar water heating adapted for multi-family housing
- Independent furniture designers helped us create open-source, flexible modular interior systems for shelters.

Now, we are seeking to grow these collaborations – especially with international partners. UK-based SMEs in green tech, construction, design, energy, and social innovation can join forces with us in areas such as:
- Material innovation for low-carbon, affordable construction
- New ownership and financing models (e.g. co-housing, community land trusts)
- Resilient building systems tailored to decentralised and post-crisis environments
- Sustainable utilities like microgrids and passive heating

Beyond State and Market: Civil Society as a Housing Actor

One of the key challenges we've identified is the narrow set of actors currently recognised as legitimate housing providers. Today, in Ukraine, most new housing is either state-commissioned or built for profit. There are very few legal and financial instruments that enable non-profit organisations to lead housing development.

We believe this must change. Ukraine's recovery should be pluralistic – enabling civil society to contribute directly to rebuilding the housing stock. This requires new policies, new financial pathways, and new types of partnerships.

CO-HATY stands as proof that non-profit housing development is not only possible – it is urgently needed.

A Two-Way Opportunity

While Ukraine will benefit from new tools, ideas, and technologies, international partners also gain something vital: the chance to test innovations in real-world, high-impact settings. Our projects serve as live labs – grounded in urgency, driven by care, and shaped by community.

Together, we can pioneer models of housing that are:
- Rooted in justice and equity
- Designed for resilience in the face of climate change and conflict
- Scalable beyond Ukraine, in a world facing growing displacement

Rebuilding Ukraine is not about returning to what was – it's about building better. CO-HATY invites emerging enterprises and visionary partners to co-create a housing future where care, sustainability, and dignity are the foundation.

Appendix

Table Appendix 1. Annual multiplier effect of projected post-war reconstruction demand on Ukraine's economy, by industry, US$ bn. Professor Vlad Mykhnenko, University of Oxford.

NACE Code	Industry group	Initial effect	Type I multipliers	Type II multipliers	Type I multipliers	Type II multipliers	Type I multipliers	Type II multipliers
			Output	*Output*	*Income effect*	*Income effect*	*GVA effect*	*GVA effect*
A01-A03	Agriculture, forestry & fishing	0.0	0.1	1.8	0.0	0.2	0.1	0.8
B05	Coal & lignite	0.0	1.0	1.3	0.2	0.3	0.4	0.6
B06	Crude petroleum & natural gas	0.0	1.6	2.3	0.1	0.2	1.2	1.7
B07-B09	Metal ores; other mining & quarrying; mining support services	0.0	2.3	2.4	0.2	0.3	1.0	1.1
C10-C12	Food products; beverages; tobacco products	0.0	0.0	1.7	0.0	0.2	0.0	0.3
C13-C15	Textiles; wearing apparel; leather & related products	0.0	0.0	0.3	0.0	0.1	0.0	0.2
C16-C18	Wood, products of wood & cork, except furniture; articles of straw & plaiting materials; paper & paper products; printing and recording services	0.0	0.4	0.7	0.0	0.1	0.1	0.1
C19.1	Coke oven products	0.0	0.5	0.6	0.0	0.0	0.1	0.1
C19.2	Refined petroleum products	0.0	1.1	1.5	0.1	0.1	0.1	0.2
C20	Chemicals & chemical products	0.0	1.1	1.7	0.1	0.2	0.1	0.2
C21	Basic pharmaceutical products & pharmaceutical preparations	0.0	0.0	0.3	0.0	0.1	0.0	0.1
C22	Rubber & plastic products	0.0	1.2	1.5	0.1	0.1	0.2	0.2

NACE Code	Industry group	Initial effect	Type I multipliers	Type II multipliers	Type I multipliers	Type II multipliers	Type I multipliers	Type II multipliers
			Output	*Output*	*Income effect*	*Income effect*	*GVA effect*	*GVA effect*
C23	Other non-metallic mineral products	0.0	4.1	4.3	0.4	0.4	0.6	0.7
C24	Basic metals	0.0	3.2	3.6	0.2	0.2	0.5	0.6
C25	Fabricated metal products, except machinery & equipment	0.0	1.7	1.9	0.2	0.3	0.3	0.4
C26	Computer, electronic & optical products	0.0	0.3	0.5	0.1	0.1	0.1	0.1
C27	Electrical equipment	0.0	0.5	0.6	0.1	0.1	0.1	0.2
C28	Machinery & equipment n.e.c.	0.0	0.7	0.9	0.2	0.2	0.2	0.3
C29	Motor vehicles, trailers & semi-trailers	0.0	0.4	0.8	0.1	0.3	0.1	0.2
C30	Other transport equipment	0.0	0.1	0.2	0.0	0.0	0.0	0.1
C31-C33	Furniture; other manufactured goods; repair & installation of machinery & equipment	0.0	0.3	0.5	0.1	0.1	0.1	0.2
D35	Electricity, gas, steam & air conditioning supply	0.0	2.4	3.4	0.3	0.5	0.7	1.0
E36-E39	Water supply; sewerage; waste management & remediation	0.0	0.1	0.2	0.0	0.1	0.0	0.1
F41-F43	Construction	16.5	26.9	27.3	2.7	2.7	5.0	5.1
G45-G47	Wholesale & retail trade; repair of motor vehicles & motorcycles	0.0	4.5	7.3	0.9	1.5	2.2	3.6
H49-H52	Land transport; water transport; air transport; warehousing & transport support	0.0	2.0	2.9	0.5	0.8	0.9	1.3
H53	Postal & courier services	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I55-I56	Accommodation; food & beverage services	0.0	0.0	0.3	0.0	0.0	0.0	0.2

NACE Code	Industry group	Initial effect	Type I multipliers	Type II multipliers	Type I multipliers	Type II multipliers	Type I multipliers	Type II multipliers
			Output	*Output*	*Income effect*	*Income effect*	*GVA effect*	*GVA effect*
J58-J60	Publishing; motion picture, video & TV programme production; sound recording, programming & broadcasting services	0.0	0.1	0.2	0.0	0.1	0.1	0.1
J61	Telecommunications	0.0	0.1	0.2	0.0	0.0	0.0	0.1
J62-J63	Computer programming & consultancy services; information services	0.0	0.2	0.4	0.0	0.1	0.1	0.2
K64-K66	Financial services; insurance, reinsurance & pension funding, excl. compulsory social security; activities auxiliary to financial services	0.0	0.7	1.1	0.2	0.3	0.5	0.8
L68	Real estate activities	0.0	0.3	1.2	0.0	0.1	0.3	0.9
M69-M71	Legal & accounting services; activities of head offices; management consultancy activities; architectural & engineering services; technical testing & analysis	0.0	0.6	0.8	0.1	0.2	0.3	0.4
M72	Scientific research & development	0.0	0.0	0.0	0.0	0.0	0.0	0.0
M73-M75	Advertising & market research; other professional, scientific & technical services; veterinary services	0.0	0.2	0.5	0.0	0.1	0.1	0.2
N77-N82	Administrative and support service activities	0.0	0.3	0.5	0.1	0.1	0.1	0.2
O84	Public administration & defence; compulsory social security	0.0	0.2	0.2	0.1	0.2	0.1	0.2
P85	Education	0.0	0.0	0.1	0.0	0.1	0.0	0.1
Q86-Q88	Human health & Social Work activities	0.0	0.0	0.1	0.0	0.1	0.0	0.1
R90-R93	Arts, Entertainment & recreation	0.0	0.0	0.1	0.0	0.0	0.0	0.0
S94-S96, T97	Other service activities; activities of households	0.0	0.0	0.1	0.0	0.0	0.0	0.1
	TOTAL	**16.5**	**59.4**	**76.7**	**7.6**	**10.6**	**15.9**	**22.8**

Notes

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Business spotlight

AICHITECT
AI-powered support tool startup that streamlines construction projects using AI, machine learning and data science to optimise industry-standard processes for architects, consultants, local government, and real estate developers – Founder & CEO David Adjei.
https://aichitect.xyz

BDP
(Building Design Partnership Ltd) An international, multidisciplinary practice of architects, engineers, designers and urbanists committed to creating environmentally responsible and socially valuable spaces.
https://www.bdp.com https://thegoodcity.bdp.com

Biohm
Startup using bio-based materials such as mycelium fungus and food waste to create new, circular construction materials for commercial buildings and domestic homes. Founder & CEO – Dr Ehab Sayed.
https://www.biohm.co.uk

Bryden Wood
Engineering firm developing solutions for decarbonised industrial infrastructure and design, specialising in net-zero data centres. Co-founder – Martin Wood.
https://www.brydenwood.com

Cedos
Independent Ukrainian think tank, urban bureau, and community working on social and spatial development issues through collaborative research into housing, education, culture and public policy. Director – Anastasiia Bobrova.
https://cedos.org.ua/en/

GreenBlue
Urban Creating sustainable urban landscapes for future generations through products and services aimed at enhancing urban tree canopy coverage, stormwater management, and urban biodiversity.
https://greenblue.com/gb/

Kotsiuba
Ukrainian landscape architecture firm bridging connections between the city and its inhabitants focus on urban public space, challenging car infrastructure. Founder & Lead architect – Maksym Kotsiuba.
https://kotsiuba.com/en

METALAB
Ukrainian urban planning laboratory and network of architects building products, community spaces and affordable housing to expand visions toward future sustainable cities in Ukraine.
https://metalab.space/en/

Vertical Future
London-based, global technology & data company developing smart vertical farming hardware and technology. Founder & CEO – Jamie Burrows.
https://www.verticalfuture.co.uk

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landscape architecture

METALAB

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