



Towards the Circular Economy in **Ukraine**

CONSTRUCTIONS





OVERVIEW

‘Constructions’¹ includes: housing new and retrofit, commercial and public buildings new and retrofit, infrastructure and civil engineering. In each of these there is a value chain life cycle of raw materials, construction, building operation, maintenance, rehabilitation and demolition.

Which are the opportunities?

On the supply side, there is the need of overcome the heavy damage to housing and infrastructure, and a lack of investment finance for rebuilding. Meanwhile a major renewal of the building stock is necessary for modern standards, but there is major disruption of communities and labour forces. The industry is fragmented, resistant to change, with low energy and CO₂ efficiency, and high waste volumes.

As for the future, much depends on economic growth, international relations, technology innovation, population change and post-war reconstruction. There is already growing pressure for circular construction systems, and successful enterprises large and small, can plan ahead for this.

¹According to the UN Central Product Classification terminology further explained at [https://unstats.un.org/unsd/classifications/Econ/Download/In%20Text/CPCv2.1_complete\(PDF\)_English.pdf](https://unstats.un.org/unsd/classifications/Econ/Download/In%20Text/CPCv2.1_complete(PDF)_English.pdf)



CIRCULARITY PATHWAYS

These pathways show a combination of actions, starting now and looking towards a **‘third horizon’ of 15-25 years.**



Constructions resources pathway

For bulk materials such as cement or glass there are new technologies for resource efficiency and low-waste production. For engineering systems and fittings, relevant for the future are ‘design for disassembly’, ‘extended producer responsibility’, and ‘service and leasing’ models.

For post-demolition waste the way forward is in coordination of markets, logistics and infrastructures, for re-use, recycling, and recovery. This is a key opportunity for the Government to work in partnership with design, construction, and technology innovation bodies.



Constructions innovation pathway

For advanced products, materials, technologies and building systems, the priority is the ‘innovation ecosystem’ across the whole chain, from raw materials to end-product users. This will promote ‘reverse logistics’ infrastructure, materials laboratories, markets for used and recovered materials.

Such innovations can address not only technology and materials, but also the human side – users, installers, designers and building managers. The government can lead in partnership with industry, with experimental ‘beacons’, ‘lighthouses’, innovation hubs and best practice learning. This combines with public awareness and skills support, on household efficiency and circular materials management.





Constructions procurement pathway

Procurement of buildings, by government, private and public clients and by real estate developers, is one key to the circular economy. Government can lead this with a combination of regulations, advice, incentives, skills development, and partnership building for circular construction.

Financial models can also be accelerated by the public sector, with combinations of subsidies, levies, and preferential loans for circular building projects. These can work in combination with the development of national standards, skills and capacity-building, data platforms, and technology innovation hubs.



When to start?

The **3-horizons approach** helps to map the priorities and opportunities:



Summary of three horizons

'CONSTRUCTIONS'	Horizon 1: 1-5 years	Horizon 2: 5-10 years	Horizon 3: 10-25 years
Business	Support creative micro-start-ups for circular design	Promote circular construction business models	Fully align with EU trade and carbon mechanism: Promote eco-valuation financial models
Governance	New building regulations and circular EPR schemes	Public procurement for circular materials and designs	Set up public finance and loan schemes for reuse/recycling
Social	Promote public CE awareness and workforce skills	Set up building owners / users programme for circularity	New 'self declaration' standards for circularity
Technology	New digitalization programme for design and production	Set up RTD hubs and labs for circular materials and design	Complete full digitalization of building performance: Innovate for hi-performance bio-materials
Industry	Resource management programme for post-war damage	Investigate advanced materials and components	Set up industrial symbiosis for material interchange. Plan industrial transformation to zero-waste LCA
Infrastructure	Coordinate energy and material efficiency systems	Set up logistics and storage for materials and components	Develop infrastructure for 100% circular materials and components



CIRCULARITY IN ACTION

Here are some examples from forward-looking enterprises in constructions under circular economy: re-usable buildings, advanced materials production, and best practice construction standards.

BlockModule Modular building production



Re-usable construction is an ideal circular solution, for prefabricated houses, offices, sanitary blocks, trade pavilions, dormitories and hotels, construction trailers, agro-industrial complexes etc. Modular buildings can be delivered quickly, at extremely low cost from starting at USD 200 per square meter. Production and delivery of prefabricated buildings takes 1-2 months, with on-site installation taking 1-2 days: an ideal solution for tourists, workers or refugees.

Rakhny Brick Plant Innovation for energy efficiency



This firm produces hyper-pressed facing bricks using a classic technology system, with raw materials extracted from the local deposit fields. The enterprise applies its own research to improve the manufacturing process and quality. Benefits include payback periods of less than one year: improvement in material and energy efficiency: 150 tonnes of waste saved per year. The company plans to continue improving its energy efficiency, with insulation of the steam engine and pipelines, readjustment of generator electrodes, and upgrade of lighting systems.

“We have learned the key lesson. A comprehensive approach for production assessment and small investments in resource efficiency can really grant tangible benefits. We now focus on retraining staff ... and plan to enter the international market in the near future”, said Viktor Kondratiuk, Director



Dobrobut Utility Company

Paving slabs made from crushed polyethylene bags mixed with sand.



This waste sorting complex in the Illinetska Amalgamated Territorial Community (ATC) contributes to waste management through sorting 60% of imported waste in 14 fractions.

The company then uses a unique technology to produce paving stones from a mixture of crushed polyethylene bags and sand. In 1.5 years, 110 tonnes of polyethylene bags have been processed into paving slabs, providing the municipality with cheaper material for improving the town area.



DGNB certification

Bonuses for applying circular economy principles in sustainable construction



The German Sustainable Building Council (DGNB) with more than 1,200 members, provides the world's most advanced sustainable building certification system. Its aim is the planning and assessment of sustainable interiors, buildings and districts. From the first version in 2008, there was a strong focus on the holistic assessment over the entire life cycle, on conscious resource use and on recycling and disassembling techniques.





CONSTRUCTIONS UNDER CIRCULAR ECONOMY, NEXT STEPS

BUSINESS AND FINANCE

For business and finance, there are service and leasing models, combined with EPR (extended producer responsibility) and EPL (extended product life), which cover many construction products and services. These can be aligned with EU frameworks for product standards, corporate reporting and investment appraisal. Circular finance models can overcome the barriers of short-term valuations, and mobilize investment in longer term solutions.

GOVERNMENT AND POLICY

For government and policy, the priorities are for legislation and regulation, and promotion of innovation systems for advanced products / materials. Integrated value chain partnerships, can bring together material producers, manufacturers, designers, specialist suppliers, labour organizations and building users. The government can lead finance initiatives for leverage on private sector investment, at national, regional and local levels of administration.

SOCIAL-COMMUNITY

For social-community issues, there is a priority for job creation and local economic development, especially for primary industries in minerals and aggregates, which may need to transition rapidly towards material recycling and recovery. Similar points apply to vulnerable and marginalized communities, where the urgent need for accommodation can mobilize new partnerships for circular construction.

DESIGN, TECHNOLOGY AND INNOVATION

Design, technology and innovation systems can be mobilized to transition from 'product' design / innovation, to 'whole supply chain' models. This then applies to eco-industrial management systems, where the principle of industrial symbiosis can be applied to construction materials recovery and exchange. Urban infrastructure is needed, from local hubs for re-used materials, to national resources for material energy recovery, starting with the post-war demolition waste mountains.

WHAT IS A CIRCULAR ECONOMY?

UNIDO defines circular economy as an industrial economy that routes materials, parts and products back into use several times and creates more value and less waste. It is an alternative, in which value is maintained for as long as possible, products are designed to last, and the generation of waste is minimized.

This booklet is one of six publications dedicated to 'Key Product Value Chains' reviewed in the Exploratory Foresight Study: constructions, food products, electronics & ICT, textiles, plastics and packaging, and waste management.

Case studies are based on the National Circular Economy Case Studies and are available at: <http://www.recpc.org/recpc-case-studies-en/>

Examples from other countries are from the <https://circulareconomy.europa.eu/platform/en/good-practices>

For more information about the **UNIDO Green Recovery Programme for Ukraine** please visit:
<https://www.unido.org/green-recovery-vision-ukraine>

Exploratory Strategic Foresight for Circular Economy in Ukraine: Final report | <https://shorturl.at/tsy63>
Circular Economy for Industrial Development in Ukraine: Baseline Study | <https://shorturl.at/DHsch>
UNIDO Online Training on Circular Economy in Ukraine | <https://shorturl.at/qfv4S>

More about Circular Economy in Ukraine is available at the **RECP Centre** page at
<http://www.recpc.org/circular-economy/>

EU4Environment Action (2019-2024) helps the EU's Eastern Partnership countries preserve their natural capital and increase people's environmental well-being by supporting environment-related action, demonstrating and unlocking opportunities for greener growth, and setting mechanisms to better manage environmental risks and impacts.

For more details, visit: www.eu4environment.org

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