CIVITTA

PREPARED FOR

BUSINESS
FINLAND

ASSESSING BUILT ENVIRONMENT VALUE CHAIN IN UKRAINE

FINAL REPORT

OCTOBER 3rd, 2023

AGENDA

1. Introduction and methodology
2. Summary findings
3. Intro to recovery needs of Ukraine
4. Construction industry performance in Ukraine
5. Built environment value chain in Ukraine
6. Appendix materials

THE REPORT'S OVERARCHING OBJECTIVE IS TO CONTRIBUTE TO BETTER UNDERSTANDING OF UKRAINE'S BUILT ENVIRONMENT AMONG FINNISH CONSTRUCTION COMPANIES

CONTEXT	• Business Finland is a leading business support organization for Finnish companies, helping them with trade & investment activities • Business Finland team has been investigating how Finnish businesses can support the Ukrainian recovery, esp. in the field of built environment, and thus bolster their presence in Ukraine • To this end, Business Finland partnered with CIVITTA, a leading management consulting company in CEE, with strong on-the-ground presence in Ukraine, to collect Ukraine-related analytics & data
REPORT PURPOSE	• The overarching objective of the effort is to contribute to better understanding of Ukraine among Finnish construction companies, highlighting areas where potential opportunities or challenges could exist in Ukraine's built environment • The Report aims to provide a holistic view of the built environment (i.e., construction) value chain in Ukraine covering each value chain step separately – from Regional Design to Prep Works to Construction to End-of-Life
SCOPE LIMITATIONS & DISCLAIMERS	• While the notion of Ukraine's rebuild is very comprehensive and involves many different topics (such as modernizing energy sector, strengthening defense sector, developing human capital, and many others), this Report focuses solely on the built environment value chain and associated challenges and opportunities • The research was undertaken during the period of August-September 2023. It is important to acknowledge that due to the dynamic nature of the situation in Ukraine, certain findings that held true at the time of this study may no longer hold relevance as of the current date; notable examples include shifts in regulatory frameworks, changes in financing coordination structures, etc. • This report is intended solely for informational purposes and does not constitute, nor should it be construed as, investment advice; the findings, analyses, and recommendations presented herein are provided with the understanding that they are not a substitute for professional financial or investment guidance

THE REPORT IS BUILT UPON A WIDE RANGE OF DATA SOURCES AND INTERVIEWS WITH INDUSTRY PLAYERS IN UKRAINE

KEY SOURCES USED THROUGHOUT THE STUDY

NOT EXHAUSTIVE

DESKTOP RESEARCH

- National statistics of Ukraine
- Eurostat data
- World Bank report 'Ukraine: Rapid Damage and Needs Assessment'
- Kyiv School of Economics report 'Report on Damages to Infrastructure Caused by Russia's War against Ukraine One Year after the Start of the Full-Scale Invasion'
- USAID report on building materials 'Activating and Strengthening Ukraine's Reconstruction Capacity'
- Ukrainian Laws and Regulations
- Secondary reports by NGOs, consultancies, etc.
- CIVITTA proprietary research

+

INTERVIEWS

Interviews with players across different steps of value chain, namely:

- Real estate developer / construction company
- Residential maintenance company
- Representatives of municipalities
- Architects, with focus on regional design, municipal projects, public spaces, etc.
- Waste management experts (with focus on construction waste topic)

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SUMMARY (1/2): (RE)CONSTRUCTION IS EXPECTED TO BE AMONG THE KEY DRIVERS OF THE RECOVERY OF UKRAINE IN THE FUTURE

Intro to recovery needs of Ukraine	• In 2022, **Russia launched the full-scale invasion into Ukraine**, which led to **dramatic war ramifications for Ukraine's economy** – e.g., GDP in current prices fell by more than 20%, inflation increased to >20%, and available labour force decreased by ~15% in 2022 • The total **direct damage of infrastructure and buildings in Ukraine is estimated to be USD 135bn**[1] (by Word Bank, as of February 2023). The largest damage is observed in housing and infrastructure sectors • **The reconstruction needs of Ukraine are much higher** – USD 411bn until 2033[1] – considering the notion of 'building back better'. Within those, USD 263bn relate directly to construction activities, where transport, housing, and energy are the TOP-3 sectors by needs' amount • Some critical reconstruction projects have been already launched, but **the massive effort is still under way – expected to gain speed over time with ever-growing activities of public institutions and private companies towards Ukraine**. Overall, construction, together with some other areas, are expected to be among **main drivers of Ukrainian recovery**

Construction industry performance in Ukraine	• **Share of construction in Ukraine's GDP was increasing between 2018 and 2021** due to overall economic growth in Ukraine; however, its level, even before the war, was **significantly lower than in other EU countries** (around 2-3% in Ukraine vs 5-8% in many EU countries)
	  ◦ Shadow economy is significant in Ukraine's construction industry, with varying % estimates
	  ◦ The key drivers of the construction growth during 2014-2021 were **positive economic development, investments in transport infrastructure, and energy and industrial construction projects**
	  ◦ Due to the Russian invasion into Ukraine, **construction industry output decreased by 58%** similar to most sectors of the economy
	• **Civil engineering construction dominated in Ukraine**, mainly driven by construction of roads, pipelines & cables, and buildings for mining or extraction

Opportunities across the UA value chain	• **Rebuilding Ukraine presents various opportunities for Finnish businesses** *(outlined on the next page)* **across the entire construction value chain.** Most of those opportunities can be explored and initiated even prior to the war end, enabling companies to start operations with/in Ukraine and securing their first-mover advantage for further growth

Source: CIVITTA analysis

1 – As of October 2023, the total damages and needs are to be higher due to the war being in active phase

SUMMARY (2/2): HIGHER-POTENTIAL OPPORTUNITIES ARE TO BE FOUND IN MATERIALS / MACHINERY SUPPLY, NEW CONSTRUCTION TECHNOLOGIES, AND END OF LIFE MANAGEMENT

List of potential opportunities for FI business across the UA construction value chain

Opportunities' potential: Higher | Medium | Lower

Regional design

Development and approval of area planning documentation (Medium)

- Supporting local authorities with developing **city building documentation**
- *However, two caveats:*
  - Most likely – a need to secure external funding for such activity or consider it as an investment in potential future collaboration as local authorities are likely to have limited funds to finance it
  - Some local authorities might face lack of capabilities when working with newly added documentation; in those cases, capability building support might be required

Preparations & planning

Permits & approvals

Design & architecture (Medium)

- Cooperating with local architects to develop **concepts for public service buildings** (e.g., healthcare); at the same time, UA architects are already active in this endeavour (e.g., schools)
- Providing **niche expertise for complex engineering projects** (e.g., linked to int'l donors such as EBRD)

Materials supply (Higher)

- **Production & provision of associated technologies / machinery around construction materials** that are expected to be in deficit during rebuild (e.g., sheet glass, concrete, cement, and many more)

Financing (Lower)

- *No major opportunities identified for FI businesses*

Construction works

Provision of building construction services (Higher)

- Provision of **technology, expertise, and know-how for prefabricated buildings** production, especially in a larger-scale segment (e.g., multi-storey buildings, etc.)
- **Provision of energy efficiency technologies and solutions**, e.g., utilizing the ESCO mechanism (i.e., option to make payments to private contractors for energy improvements through saved energy bills);
- **Provision of decentralized energy solutions** at construction stage
- **Construction of shelters** for residences, education institutions, hospitals, public facilities (security need)

Real Estate operations

Primary and secondary market (Lower)

- *No major opportunities identified for FI businesses*

Service & Maintenance

Maintenance, renovation, special services (Medium)

- **Provision of innovative solutions** with respect to residential facility management in such areas as:
  - e-democracy
  - waste management
  - decentralized energy supply
  - water filtration
  - security
- However, lack of funds on the facility management companies' side can result in low purchasing power for such technologies and solutions

End of Life

Deconstruction, demolition, waste processing and disposal (Medium / Higher)

- **Provision of equipment / technology or engaging directly into construction waste recycling** in Ukraine (both short-term – due to debris – and long-term – due to aging infrastructure and housing stock); however, detailed regulation on recycling and strong regulatory enforcement is still underway
- Support with industrial conversion projects (converting industrial areas into other functional ones)

! **For the initial steps into the Ukrainian market (across any step of value chain), it is recommended to consider potential partnerships or joint ventures with local companies – which could increase chances for success given local specifics**

Source: CIVITTA analysis

Preliminary view on potential opportunity areas (based on the weak spots / gaps in the UA market)

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IN 2022, RUSSIA LAUNCHED THE FULL-SCALE INVASION INTO UKRAINE; NOW HOSTILITIES TAKE PLACE IN SOUTH AND EAST OF THE COUNTRY

MAIN DIRECTIONS OF RUSSIAN INVASION INTO UKRAINE AND CURRENTLY OCCUPIED TERRITORIES

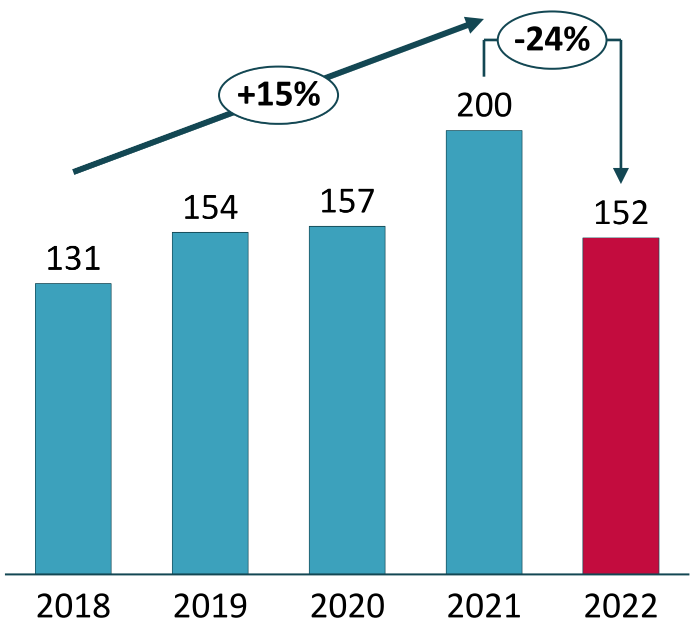
COMMENTS

- Russia annexed Crimea and ignited warfare in the Donbass region in **2014 which is the starting point for a Russo-Ukrainian war**
- In February 2022**, Russia launched the full-scale invasion of Ukraine from multiple directions** – from annexed Crimea and occupied territories, Belarus, and Russia itself
- **Armed Forces of Ukraine conducted successful operations** in Kyiv, Chernihiv, Kharkiv, Sumi, and Kherson regions in 2022, liberating vast territories in the North, East, and South of the country
- There is a new counteroffensive action happening right now – final results are yet to be seen
- **Nevertheless, as of now, hostilities are localised to South and East of Ukraine, while the only major risk for other regions is air attacks**

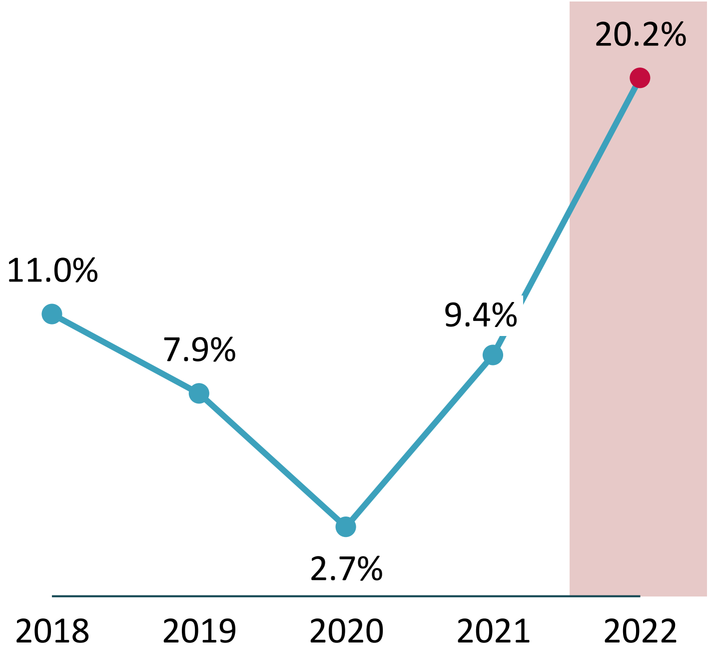
Source: CNN (for map), public sources

THE FULL-SCALE INVASION OF RUSSIA LED TO DRAMATIC WAR RAMIFICATIONS FOR UKRAINE'S ECONOMY

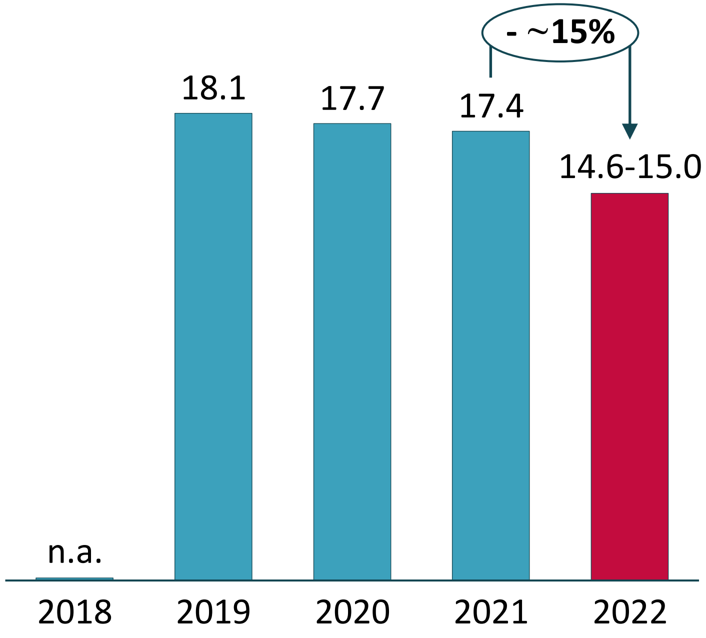
UKRAINE'S GDP, 2018-23, CURRENT BN USD



UKRAINE'S INFLATION RATE, CONSUMER PRICES, 2018-23, %



UKRAINE'S LABOUR FORCE, 2021-22, M PEOPLE



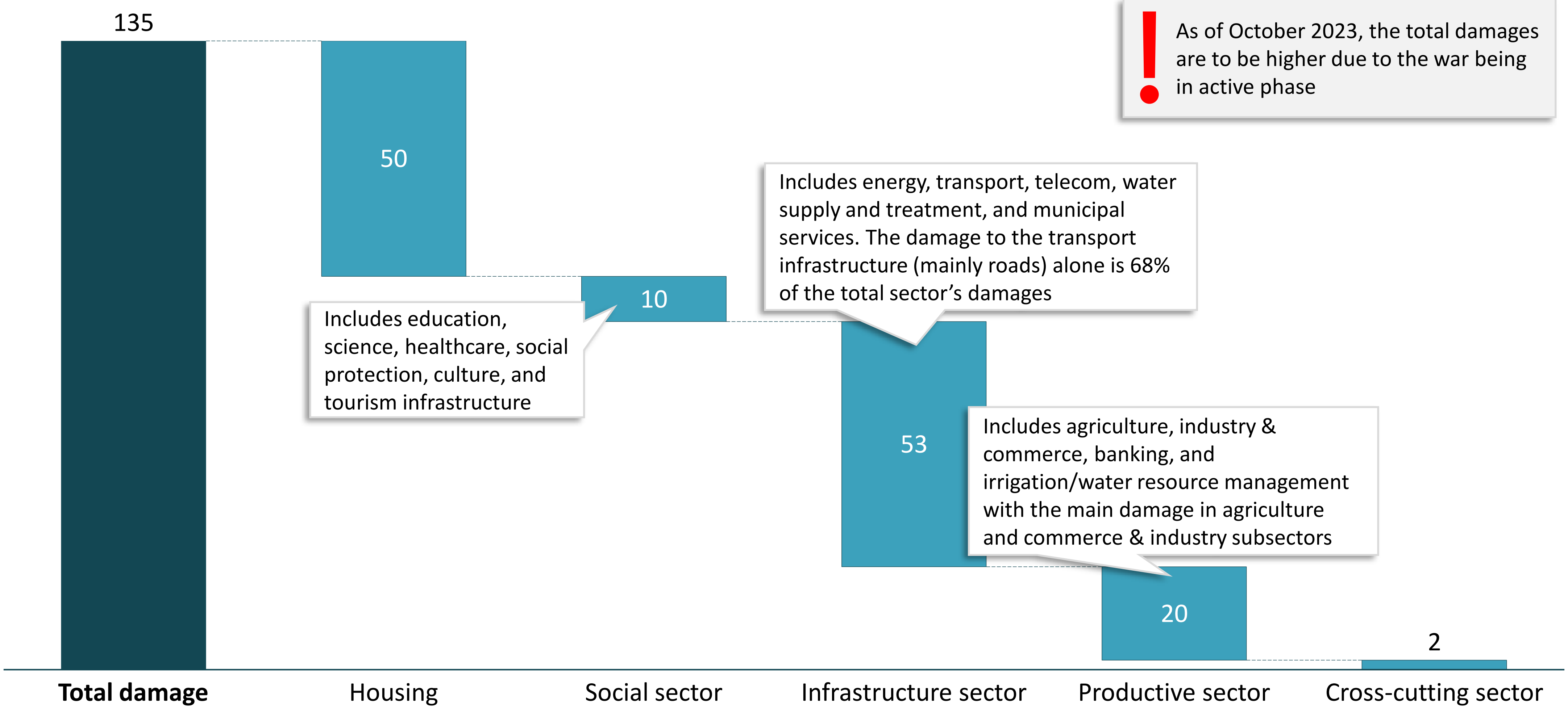
COMMENTS

- The war became the major factor that hindered rapid economic development which was observed before the war
- The war in Ukraine has affected the economy simultaneously from various angles – both temporary loss and inability to actively use certain territories and the major loss of human capital with millions people fleeing the country and many thousands being killed or injured

Source: IMF, World Bank, Ukrstat, CIVITTA Analysis

THE TOTAL DIRECT DAMAGE OF INFRASTRUCTURE AND BUILDINGS IN UKRAINE IS ESTIMATED TO BE USD 135BN (AS OF FEBRUARY 2023)

DIRECT DAMAGE OF INFRASTRUCTURE AND BUILDINGS IN UKRAINE (BY TYPE), AS OF 24 FEBRUARY 2023, BN USD



! As of October 2023, the total damages are to be higher due to the war being in active phase

Source: World Bank

THE LARGEST DAMAGE IS OBSERVED IN EASTERN REGIONS; RECENTLY, MORE DAMAGE HAS BEEN ACCUMULATING IN ZAPORIZKA OBLAST DUE TO ACTIVE HOSTILITIES THERE

DIRECT DAMAGE OF INFRASTRUCTURE AND BUILDINGS IN UKRAINE (BY REGION), AS OF 24 FEBRUARY 2023, BN USD

! As of October 2023, the total damages are to be higher due to the war being in active phase

Source: World Bank

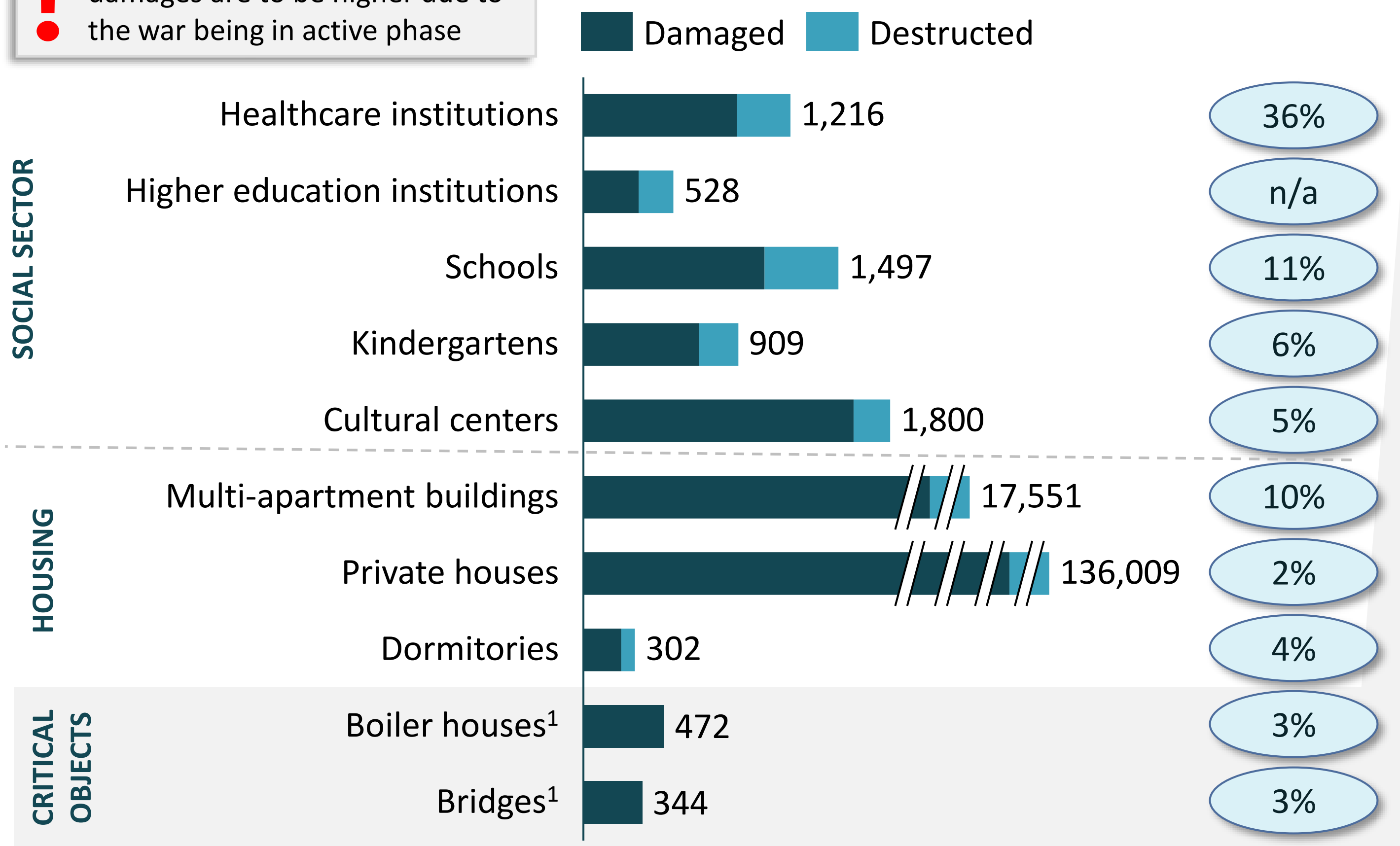
THE SCALE OF DESTRUCTION IS EVIDENT ACROSS ALL TYPES OF BUILDINGS – IN SOCIAL OBJECTS, HOUSING, CRITICAL INFRASTRUCTURE, AND INDUSTRIAL CONSTRUCTIONS

XX% Total share of objects damaged or destructed

DAMAGED AND DESTRUCTED BUILDINGS AND INFRASTRUCTURE OBJECTS, AS OF FEBRUARY 2023

! As of October 2023, the total damages are to be higher due to the war being in active phase

Damaged and destructed objects of infrastructure



Facilities of **80+ large or medium-sized enterprises** have been either destructed or severely damaged

25 thousand km of roads are subjected to reconstructions because of the hostilities

1000+ km of water supply network required repairs or reconstructions to supply residents the clean water

18 airports across the country have been either destructed or damaged

EUR 6+ bn of direct damage to the power sector caused by the war

Bigger damage to the power sector is expected due to targeted shelling by Russia

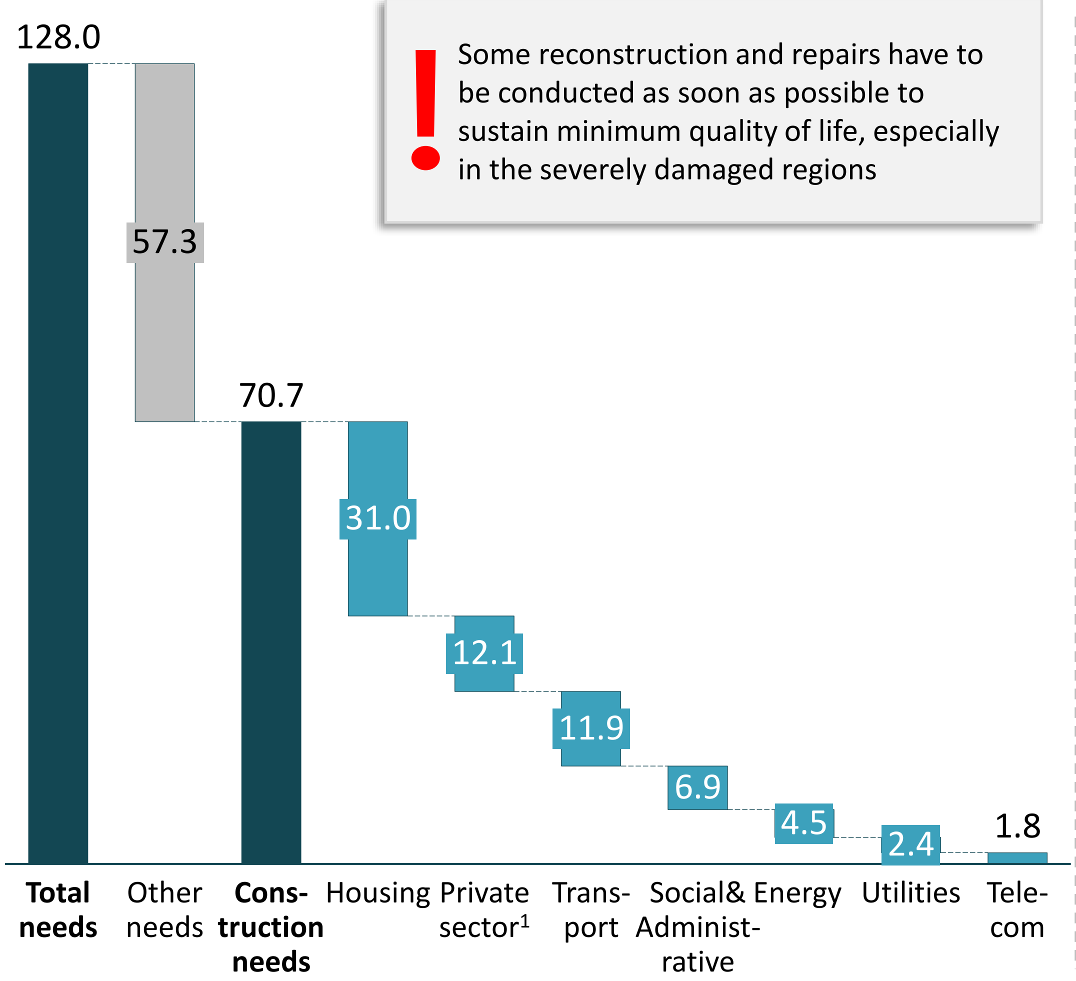
Source: Kyiv School of Economics, CIVITTA analysis

1 – The number of fully destructed facilities is not available

RECONSTRUCTION NEEDS ARE MUCH HIGHER – CONSIDERING THE NOTION OF ‘BUILDING BACK BETTER’

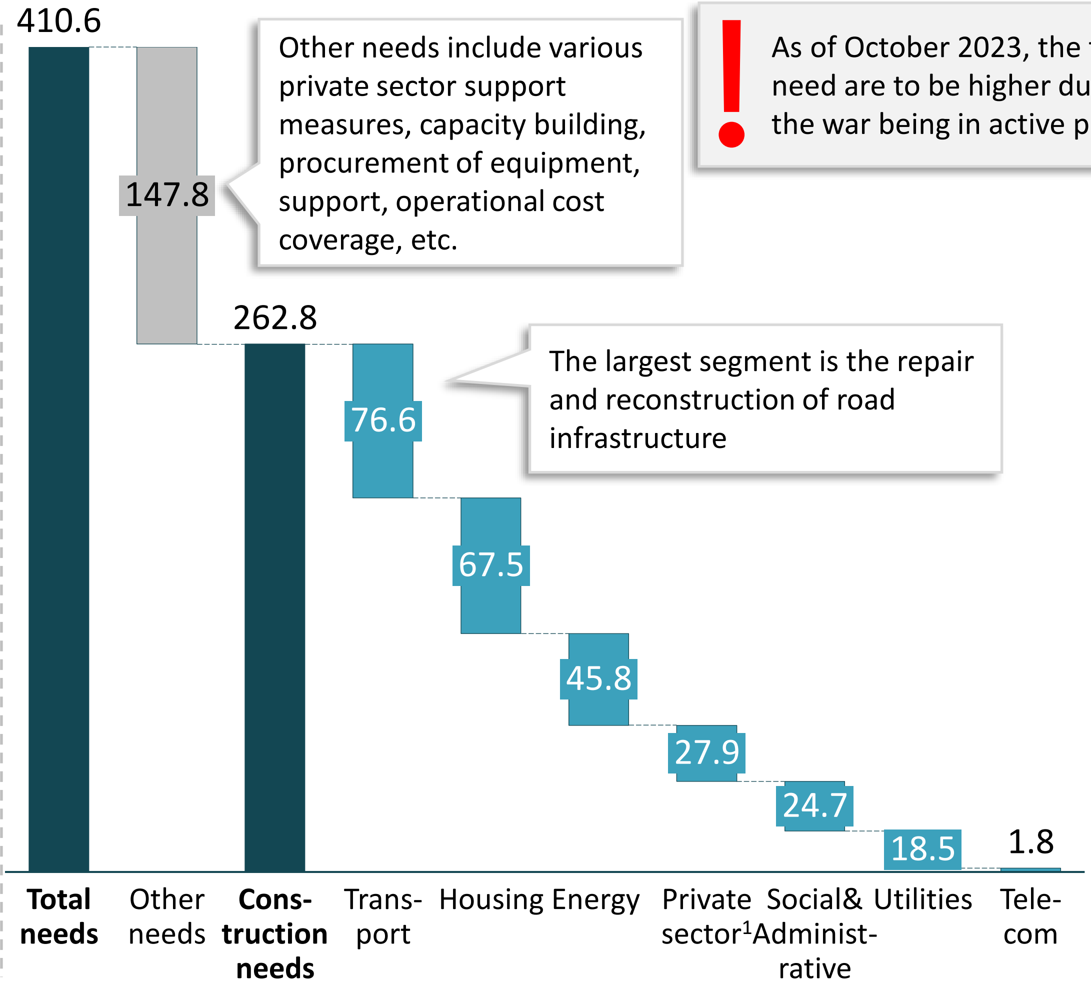
Total needs are calculated by World Bank; split into construction and non-construction needs is performed by CIVITTA

NEEDS UNTIL 2026, BN USD



! Some reconstruction and repairs have to be conducted as soon as possible to sustain minimum quality of life, especially in the severely damaged regions

TOTAL NEEDS UNTIL 2033, BN USD



Other needs include various private sector support measures, capacity building, procurement of equipment, support, operational cost coverage, etc.

! As of October 2023, the total need are to be higher due to the war being in active phase

The largest segment is the repair and reconstruction of road infrastructure

1- Replacement of damaged assets by private enterprises mainly in industrial, but also agricultural and commerce sectors

Source: World Bank, CIVITTA Analysis

SOME CRITICAL RECONSTRUCTION PROJECTS HAVE BEEN ALREADY LAUNCHED, BUT THE MASSIVE EFFORT IS STILL UNDER WAY

SELECTED EXAMPLES

Social infrastructure

Makariv ambulatory was destroyed during the occupation of the town. Kyiv School of Economics **charity organization** funded the reconstruction of the building while the equipment has been provided by several international organizations such as UNICEF, USAID, etc.

The year-long reconstruction was finished in August 2023.

Critical Infrastructure

Water pipes have been severely damaged during the occupation of Balakliya so that the majority of the population did not have access to clean water.

UNICEF has funded the repair works. As of June 2023, construction works have already started.

Housing

American non-profit organization Global Empowerment Mission (GEM) together with partners and the authorities repaired 110 houses and carried-out significant repairs in about 20 of them. 12 destroyed houses were rebuilt from scratch.

(!) However, the major reconstruction effort is still under way – expected to gradually gain speed over time

Source: Kyiv School of Economics, eRecovery, MinFin, UNICEF, Dumka

CONSTRUCTION, TOGETHER WITH SOME OTHER AREAS, ARE EXPECTED TO BE AMONG MAIN DRIVERS OF UKRAINIAN RECOVERY

(Re)construction of infrastructure

Ukrainian infrastructure (housing, social, transport, energy, etc.) has been severely damaged during the war and needs to be not only repaired but also "built back better" to compensate for the lost time during the war

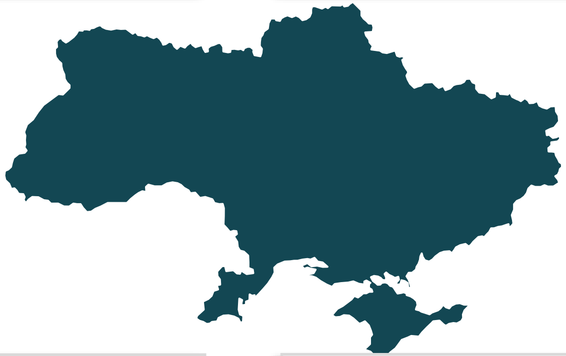
FOCUS OF THIS REPORT

Support of SMEs

Ukrainian SMEs have incurred dramatic losses during the war while they are the key force of economic development and job creation in the country, especially in more rural areas, therefore majorly contribute to the social stability of the population

Development of human capital

Development of human capital both in public and private sectors will enable the country to rebuild its decreased workforce, empower individuals with skills and knowledge, attract investment through a skilled labor pool, and establish a foundation for sustained growth



Euro-Atlantic integration

Integration allows Ukraine to better align with democratic values, enhance security through partnerships with NATO and the European Union, and foster economic development through increased trade and cooperation with Western nations

Empowering civil society

Will help maintain social cohesion by providing platforms for dialogue and community engagement, which are vital for strengthening political institutes and human rights which positively affects the country's attractiveness to foreign investors

Strengthening defense sector

Strengthening the defense sector by upgrading equipment and building skills and knowledge bases among soldiers is the key to ensuring the international security of Ukraine that will allow it to recover from the hostilities it survives

Finnish businesses can significantly contribute to the recovery of Ukraine by supporting (Re)construction of the country's infrastructure, as well as providing their expertise on other crucial areas (e.g., civil society, human capital, defense, etc.)

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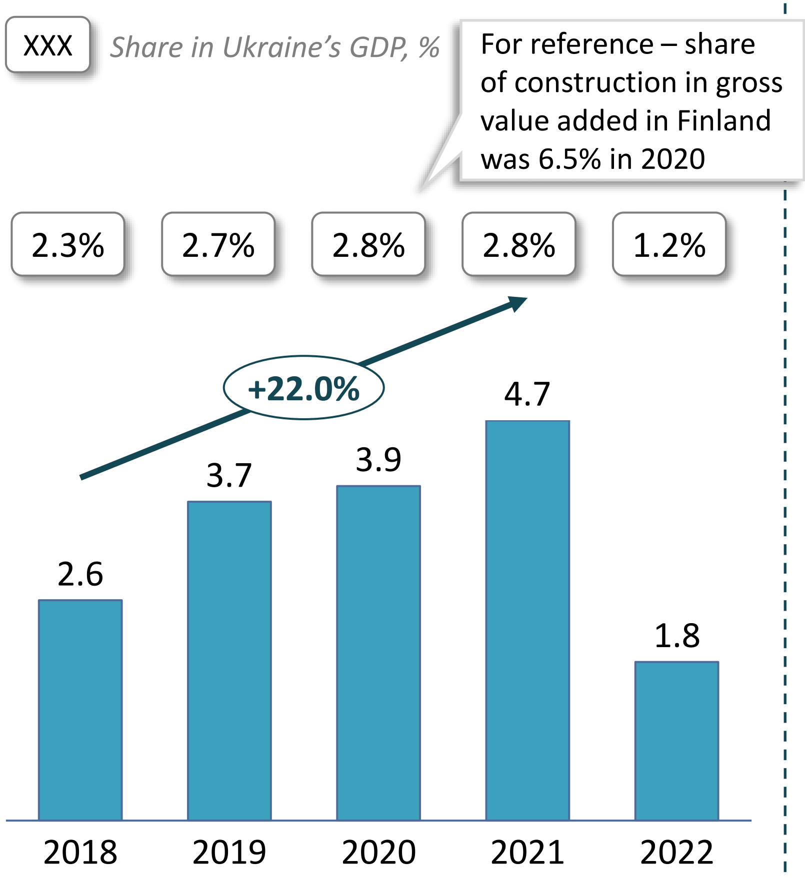
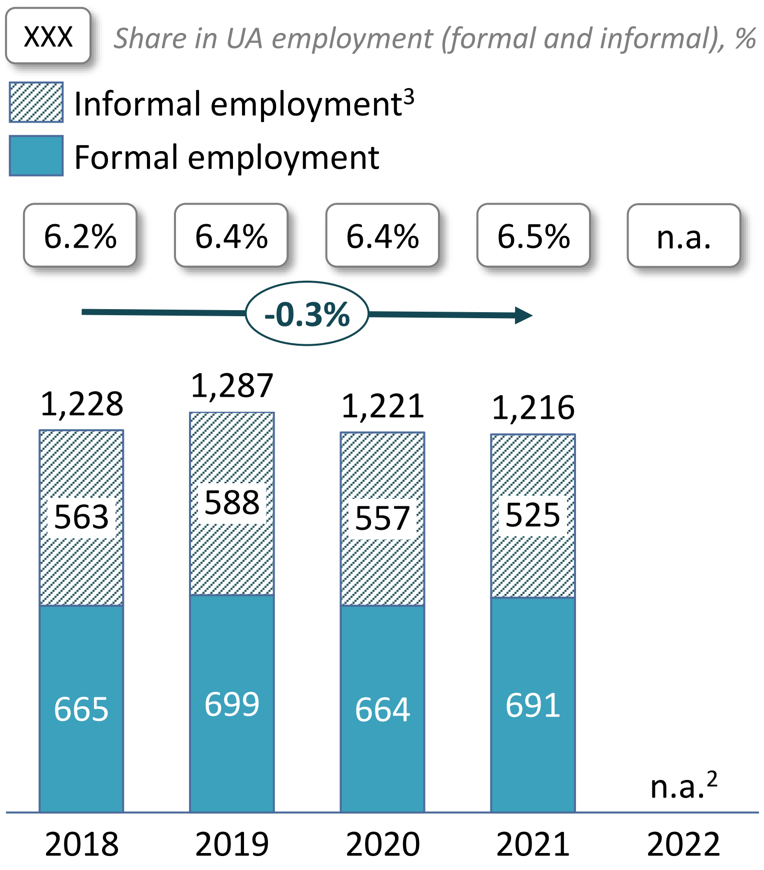
CONSTRUCTION INDUSTRY'S SHARE IN UKRAINE'S GDP WAS AT 2-3% BEFORE THE WAR – STILL BELOW MANY EU COUNTRIES DESPITE PAST GROWTH

CONSTRUCTION INDUSTRY VALUE ADDED IN UKRAINE'S GDP, 2018-22, EUR B[1]



1 – Only construction, w/o real estate activities

NUMBER OF EMPLOYEES IN CONSTRUCTION INDUSTRY IN UKRAINE, 2018-22, K PEOPLE



2 – Data for the indicator was not collected in 2022 due to the ongoing war

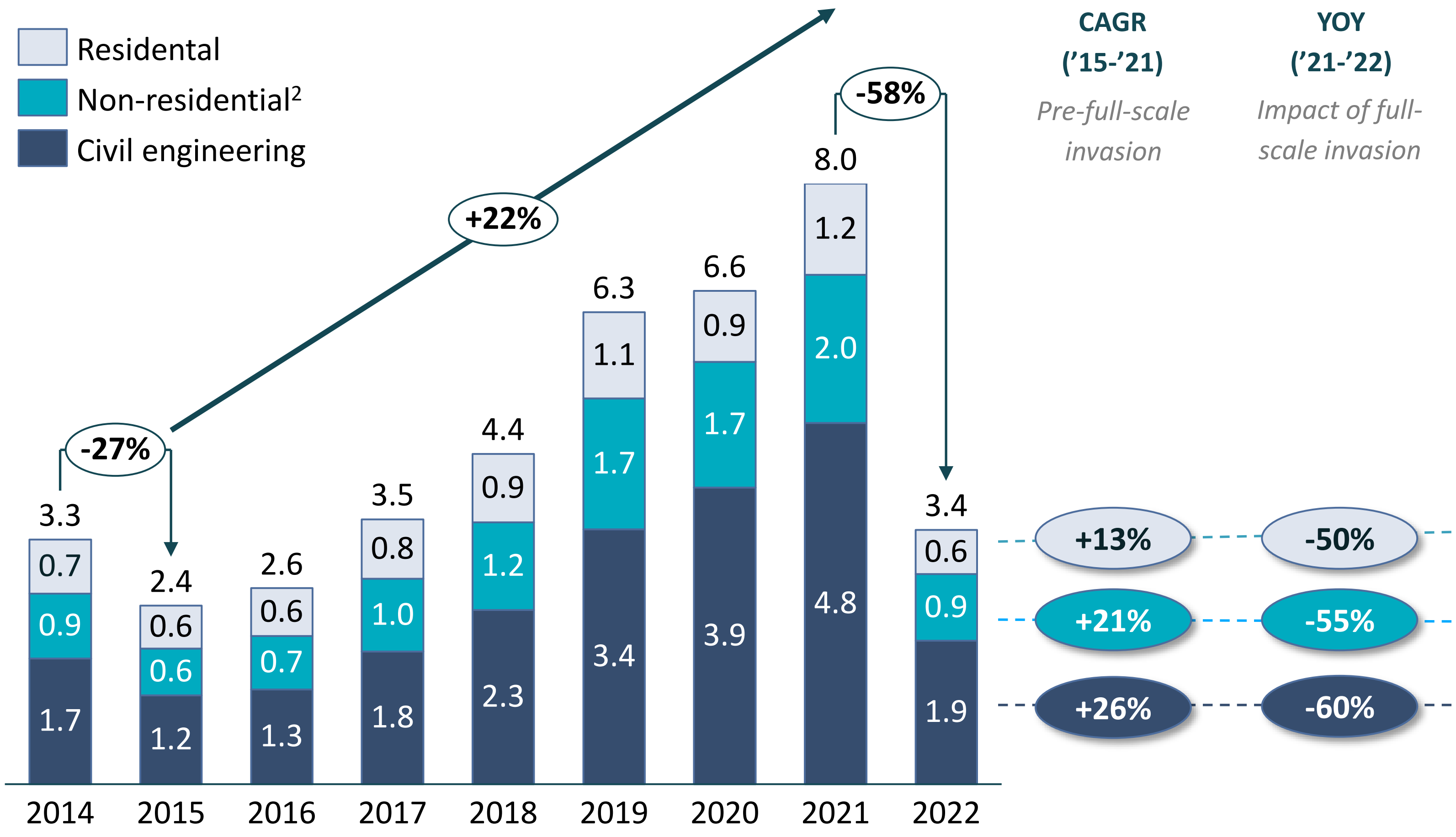
3 – Informal employment includes employees who are not formally (legally) registered with state authorities

COMMENTS

- Share of construction in GDP was increasing between 2018 and 2021 due to overall economic growth in Ukraine; however, its level, even before the war, was significantly lower than in other EU countries (around 2-3% in Ukraine vs 5-8% in many EU countries)
  - Shadow economy is significant in Ukraine's construction industry, with varying % estimates
- Construction is the 8th largest sector by the share of the total number of formally employed population in Ukraine between 2017-2021

BEFORE THE WAR, CONSTRUCTION WAS RAPIDLY EXPANDING AFTER 2015 COLLAPSE, AND HIT AGAIN DUE TO THE FULL-SCALE INVASION IN 2022

CONSTRUCTION INDUSTRY OUTPUT VALUE BY TYPE[1], 2014-22, EUR B



1 – Data excludes the territories temporarily occupied by Russia and part of territories where the military actions are/were conducted

2 – Non-residential incl. social, commercial, and industrial construction

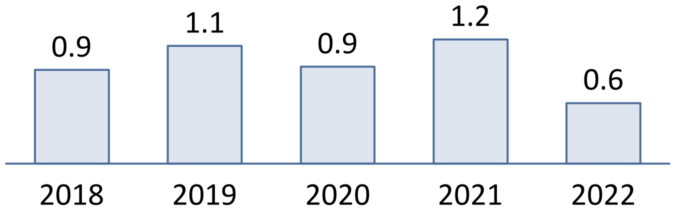
COMMENTS

- 27% drop in construction value in 2015 resulted from the depreciation of hryvnia by more than 50% compared to 2014
- The key drivers of the construction growth during 2014-2021 were positive economic development, investments in transport infrastructure, and energy and industrial construction projects
- Due to the Russian invasion into Ukraine, construction industry output decreased by 58% similar to most sectors of the economy

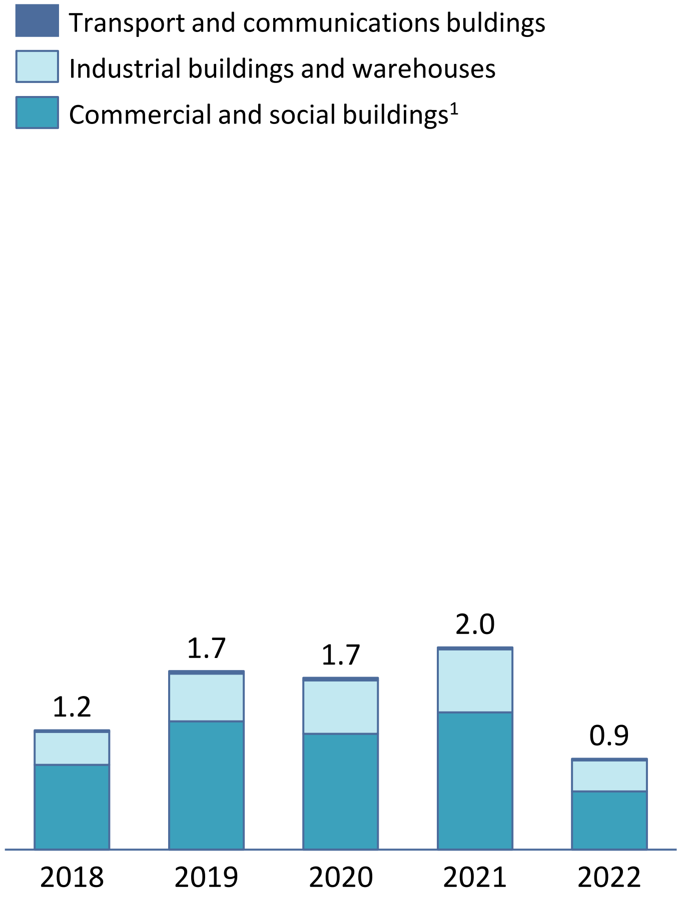
CIVIL ENGINEERING CONSTRUCTION DOMINATED IN UKRAINE, DRIVEN BY CONSTRUCTION OF ROADS, PIPELINES & CABLES, MINING/EXTRACTION BUILDINGS

CONSTRUCTION INDUSTRY OUTPUT VALUE BY SUBCATEGORY, 2018-22, EUR B

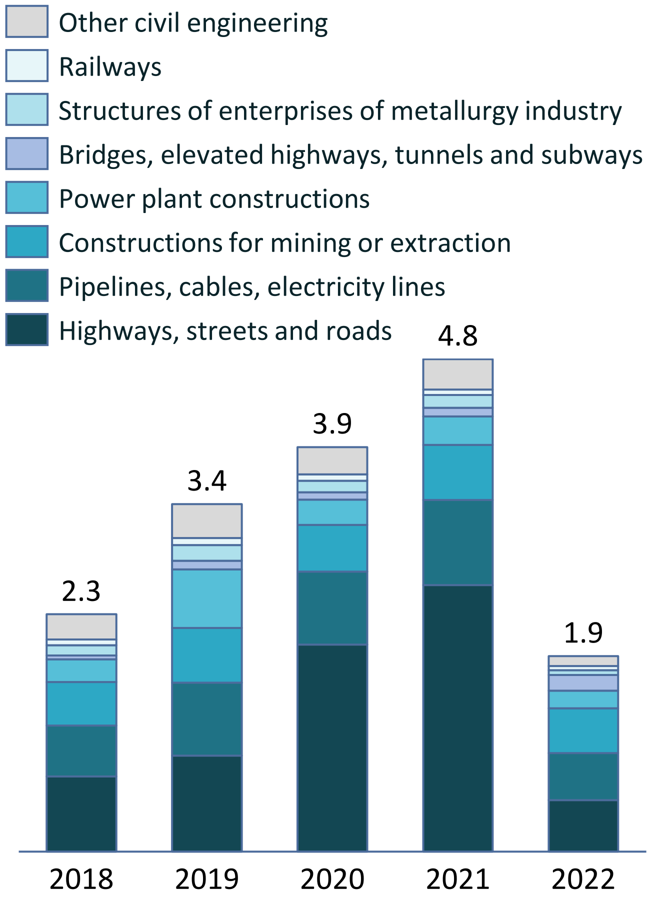
Residential



Non-residential



Civil engineering

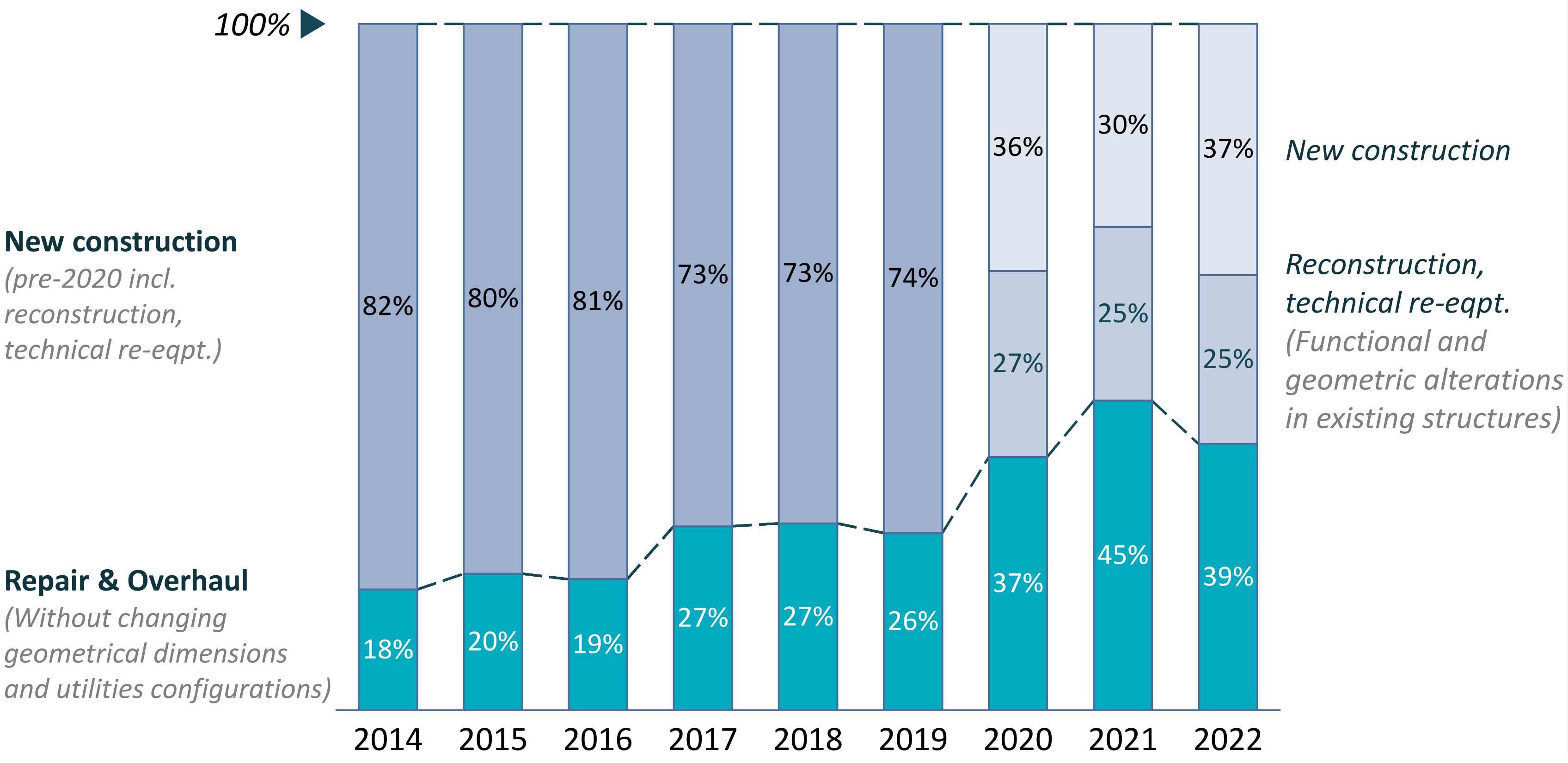


1 – No further split available

Source: Ukrstat

RECENTLY, REPAIR CONSTRUCTION VOLUME INCREASED SIGNIFICANTLY IN UKRAINE, WHILE NEW CONSTRUCTION ACCOUNTED FOR ~60% OF WORKS IN 2020-22

CONSTRUCTION VALUE SPLIT BY CHARACTER OF CONSTRUCTION, %, 2014-22



COMMENTS

- New construction was predominant in Ukraine in 2014-19, while repairs increased its share significantly in 2020-22
- Potential reason behind repair's share growth in 2020-21 could be a massive road renovation programme launched in 2020, while 2022's share could be explained by the restoration needs after military actions

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WE ANALYSE CONSTRUCTION VALUE CHAIN IN UKRAINE STEP-BY-STEP

	Regional design	Preparations and planning	Construction works	Real Estate operations	Service & Maintenance	End of Life
PROCESS	**A** Development and approval of area planning documentation	**B1** Permits & approvals **B2** Design & architecture **B3** Materials supply **B4** Financing	**C** Provision of building construction services	**D** Primary market (incl. going into operation) & Secondary market (incl. re-sale and rental)	**E** Maintenance, renovation, special services	**F** Deconstruction, demolition, waste processing and disposal
KEY ACTORS	• Local & national authorities • Civil society • Urban developers • Investors	• Local & national authorities • Architects, engineers, etc. • Construction companies • International donors, banks	• Construction companies, contractors, subcontractors • RE developers • Architects, engineers, etc.	• RE developers and RE companies	• Maintenance providers • Service companies	• Construction companies • Waste recycling companies • Local authorities

A

\ REGIONAL DESIGN: UKRAINE ADHERES TO AN ADVANCED SET OF CITY BUILDING DOCUMENTATION, BUT ITS OVERALL AVAILABILITY AND READINESS ARE LIMITED

Regional design in Ukraine is legally governed by the following set of documents, while actual enforcement is weak

- General Plan
- Detailed Area Plans and Zoning Plans
- Other specific docs (esp. on land usage)

Comments:

- Development of the above documents is initiated by local authorities
- Usually, an urban developer with sufficient expertise and with employees who have required certificates/licences is selected
- Although those documents are supposed to be key in further planning of construction activities, most of them are obsolete and thus are not used to their full extent:
  - In certain cases, changes to the above documentation (on city building and land usage) are done on the ad-hoc basis, once there is a specific project in place, to ensure adherence – rather than those documents are used for initial planning

Recently, a new set of documents has been approved that complements existing city building documentation

- Complex Plan of Spatial Development
- Program of the Complex Restoration
- Concept of Integrated Development

For hromadas that consist of 1 city only (e.g., Kyiv), complex plan is not needed (as it essentially would duplicate General Plan)

Comments:

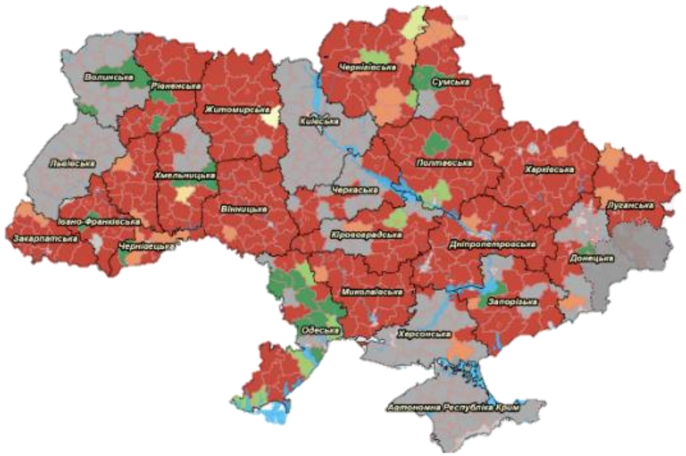
- The government adopted a new set of documents that is expected to be used during the recovery process to plan reconstruction, with a Complex Plan being among the key documentation
  - A Complex Plan does not substitute the existing docs, but becomes mandatory for implementation afterwards, meaning that any action suggested in it should be properly reflected in the existing documentation (General Plan, Detailed Plans, etc.)
- Despite those documents being mandatory, municipalities are limited in their possibilities to fund their development; one potential support area / **collaboration opportunity involves partnering with local municipalities in developing city building documentation for them**
  - For massive reconstruction projects (e.g., whole districts, cities, etc.), it is recommended to have the above docs beforehand

\ REGIONAL DESIGN (BACK-UP): MOST OF SPATIAL PLANNING DOCUMENTATION IS OBSOLETE, ESP. WHEN MOVING TO MORE PRACTICAL LOCAL LEVEL

ASSESSMENT OF AVAILABILITY OF SPATIAL PLANNING DOCUMENTATION IN UKRAINE, BY YEAR OF ITS DEVELOPMENT, AS OF 2019

Regional

Sub-Regional

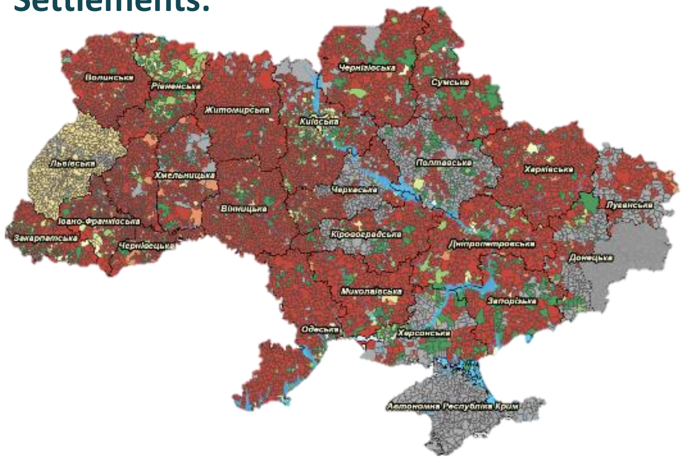


Legend:

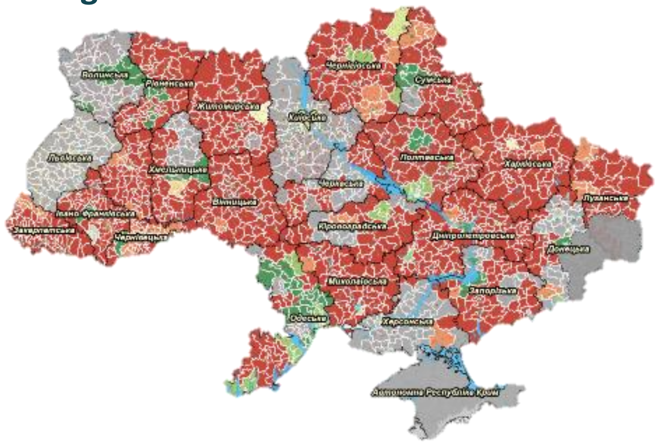
Lack of data	2002-2006
1917-1991	2006-2010
1991-1996	2010-2014
1996-2002	2014-2019

Local

Settlements:



Amalgamated hromadas:



Source: PMAP

A

\ REGIONAL DESIGN (BACK-UP): THE PROCESS OF PREPARING A COMPLEX PLAN OF SPATIAL DEVELOPMENT IS AS FOLLOWS – INVESTORS CAN ACTIVELY PARTAKE IN THE PROCESS

PROCESS FOR PREPARING COMPLEX PLAN OF SPATIAL DEVELOPMENT

Preparation

- Approving the decision regarding the Plan's development
- Forming a working group
- Collection of input data
- Publication of data re development of amalgamated hromadas, SWOT analysis, etc.
- Running a public survey re objectives for the Plan's development, its TOR
- Approving the TOR for the Plan
- Selecting the developer

Development

- Transferring input data to the developer
- Development of the Complex Plan
- Running a Strategic Ecological Assessment
- Running public hearing on the developed Complex Plan
- Organization of the Plan's draft discussion by the city building council
- Alignment of the Complex Plan with local authorities of other amalgamated hromadas
- Publication of the Complex Plan's draft

Finalization

- Transferring output data to the developer
- Conducting an independent audit of the Complex Plan
- Approval and publication of the Complex Plan

However, according to experts, in certain cases, there is **a capability gap on the level of local government** in planning and design due to lack of know-how and experience → **capability building support might be required**

(!) Procedure of developing the Complex Plan is detailed in the government instructions; complete alignment with all steps should be ensured

B1 \ PERMITS AND APPROVALS: COMPLIANCE WITH ALL REGULATORY STEPS SHOULD BE ENSURED TO GUARANTEE THE OBJECT'S FINAL ENTRY INTO OPERATION

KEY REGULATORY COMPLIANCE STEPS FOR CONSTRUCTION PROJECTS IN UKRAINE

High-level summary of steps – differences exist based on type of construction and its risk class (CC1, CC2, CC3)

Pre-construction

- Compatibility with land purpose and functional usage of area should be ensured (changed if needed – as often the case)

Usually, a lengthy process (associated with relatively higher corruption risks) that can take 1-3 years; there is an initiative at the parliament to simplify the procedure for energy objects to 1.5 month

- A proper project documentation should be developed beforehand, signed and confirmed by licensed specialists
- Project documentation should be appraised/reviewed
- Notification on the launch of construction should be made

Construction

- Need to ensure proper and continuous author and technical supervision/oversight during construction

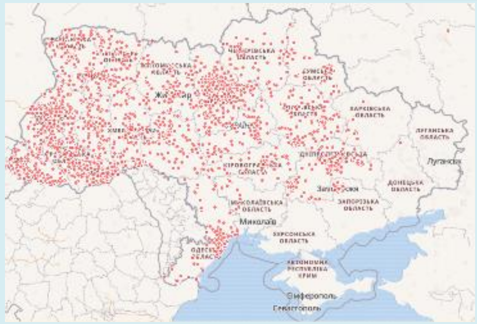
Post-construction

- Notification on the end of construction should be made
- Building should be entered into operation

Exact steps depend on the type of building (in certain cases, could be associated with increased corruption risks)

!

- To streamline the process of receiving permits for construction and lower the corruption risks, Ukraine launched eConstruction platform that aims to digitize construction permits, registers, data, regulations and stakeholders
    - The expected update should ensure availability of all costing and technical documentation for publicly funded projects to improve transparency



**eConstruction permits issued in August 2023*

If there is gap in regulations' compliance at any step of construction activities (pre, during, or post construction), the final entry into operation cannot be approved by authorities

- **There are indications that absence of proper project documentation before the construction launch is one of the issues in the recovery process now**

CIVITTA Source: Interviews with local experts, national regulation

\ DESIGN & ARCHITECTURE: LICENSING IS LARGELY A FORMAL PROCEDURE, BUT INT'L PLAYERS ARE STILL ENCOURAGED TO FIND LOCAL PARTNER DUE TO UA STANDARDS' SPECIFICS

KEY ACTORS INVOLVED IN DESIGN, ARCHITECTURE, PLANNING AND TECHNICAL SUPPORT

Licensing	Private Professionals
National Association of Ukrainian Architects	• Architects (~4,000)
Guild of Technical Supervision Engineers Construction of Architecture Objects	• Planning engineers (~16,000) • Technical engineers (~9,000)
Association of Experts of Construction Industry	• Experts (~5,000) • Consulting engineers (~300)
• Issue licenses, provide training, and engage in lobbying	• Provide services to developers in a competitive market with includes dozens of private architecture, design, and project bureaus in Ukraine

Self-governing industry associations

*(Number of **registered** professionals according to eConstruction)

- **Licensing is largely a formal procedure in the market** where a signature is required on the final project only; the rest of the team who are not required to sign can still provide architectural and design services
- However, **international players are still encouraged to work with local partners** due to specifics of Ukrainian construction standards (DBN)

Source: National regulation, industry interviews

B2 \ DESIGN & ARCHITECTURE: UKRAINIAN ARCHITECTS ARE PARTICULARLY STRONG IN DELIVERING RESIDENTIAL AND COMMERCIAL PROJECTS

Ukrainian architects' market is particularly strong in residential and commercial construction (retail, offices, etc.). Major architecture company brands include: Paschenko, Makhno, Archimatika, AIMM, Balbek, and AVR…

ILLUSTRATIVE PROJECTS DEVELOPED BY UKRAINIAN ARCHITECTS

However, there could be a potential gap in selected local expertise for complex engineering projects, primarily due to limited market over past 20 years (although recent projects, e.g., Beskyd tunnel and Zaporizhye bridge were designed by local bureaus). Particularly, one of the challenges for UA architects' market is it being disconnected from the European & Global stage due to lack of norms' harmonization

For larger infrastructure projects, international donors or creditors (e.g., EBRD, EIB, etc.) could potentially involve foreign companies for technical supervision or ToR development

Source: Industry interviews, CIVITTA Analysis

B2

\ DESIGN & ARCHITECTURE: UKRAINIAN ARCHITECTS HAVE BEEN ALREADY INVOLVED IN DEVELOPMENT OF TYPICAL PROJECTS (EDUCATION AND CIVIL SERVICES)…

TYPICAL PROJECTS DEVELOPED BY UKRAINIAN ARCHITECTS FOR COMMON USE

ILLUSTRATIVE CASE STUDY

- **Typical projects developed** within Ukraine Recovery Programme under European Investment Bank
- **Typical projects include**:
  - building of the administrative services centre with a total area of ~500 m²
  - buildings of preschool education institutions for 225, 150 and 75 children
  - buildings of school education institutions for 1,008, 672, and 336 students
- **Design & development done by Architects Pashenko** (UA company), in cooperation with Cowater International

B2

DESIGN & ARCHITECTURE: … AS WELL AS HAVE BEEN SUGGESTING INNOVATIVE CONCEPTS FOR HOUSING FOR INTERNALLY DISPLACED PEOPLE

RE:UKRAINE HOUSING PROJECT PROPOSED BY BALBEK BUREAU

ILLUSTRATIVE CASE STUDY

- **RE:Ukraine System (a housing project for internally displaced people)** was developed by balbek bureau, an interior architecture studio with 14 years of experience designing residential and commercial spaces
- The team claims that the project is entirely non-profit, so the RE:Ukraine Housing project needs financial support from external partners

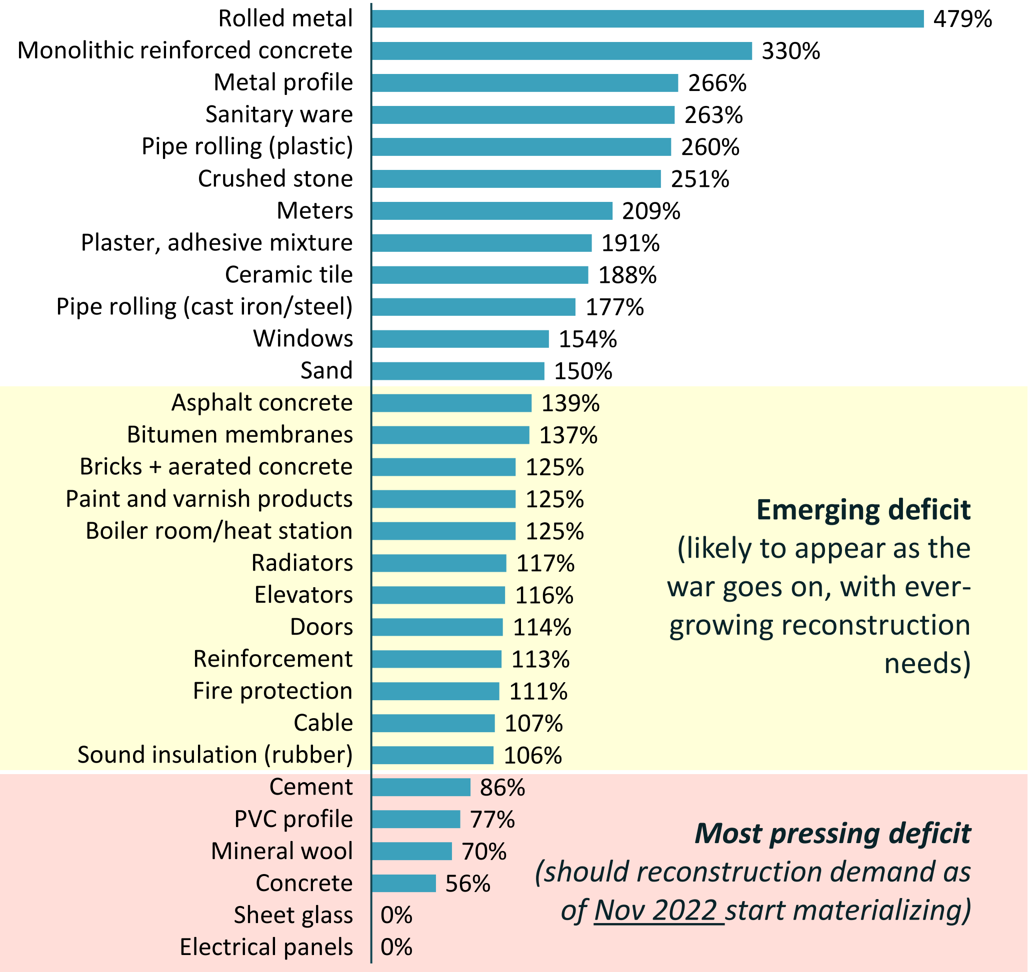
Source: balbek bureau website

B3 \ BUILDING MATERIALS: SOME MATERIALS ARE EXPECTED TO BE IN DEFICIT DUE TO HIGH RECONSTRUCTION NEEDS AND CAPACITY LIMITATIONS DUE TO WAR

DOMESTIC PRODUCTION IN UKRAINE PRIOR TO INVASION

- Ukrainian market for construction materials was estimated at $18 billion in 2021
- Internal production covered 90% of needs
- Exports were low, 95% of internally produced materials were consumed in Ukraine
- Approximately 130,000 people were employed in the sector

CAPACITY OF DOMESTIC PRODUCTION OF MATERIALS TO COVER RECONSTRUCTION DEMAND (AS OF NOV 2022)



Major reasons for capacity limitations:

- Destruction of 15% of facilities in Ukraine due to military activities, e.g.:
  - Sole sheet glass factory Proletariy damaged in 2014
  - Dry gypsum plants Knauf and Siniat destroyed in Bakhmut
  - Sheet metal factories MMK and Azovstal destroyed
  - 50% of PVC window factories damaged (mainly in Kyiv region)
  - Damage to large insulation producers (mineral wool)
  - Large cement factory Balcem damaged (Balakliya)
- Cease of imports from Russia and Belarus (supplied significant proportion of sheet glass, asbestos, dry mixes, wood materials)

Disclaimer: Domestic capacity measured against reconstruction needs only; deficit is expected to be higher when usual consumption needs are added and/if economy starts recovering faster

B3

\ BUILDING MATERIALS: MOST PRESSING NEEDS WILL BE OBSERVED IN ELECTRICAL PANELS, SHEET GLASS, CONCRETE, CEMENT, MINERAL WOOL, AND PVC PROFILES

HIGH-DEFICIT BUILDING MATERIAL	STATUS QUO	EXPECTED NEW DEVELOPMENTS
Electrical panels/switchboards	• No major production in Ukraine; domestic demand is covered by imports from major international brands (Schneider, Shrack, ABB, Legrand)	• No publicly known investment plans
Sheet glass	• No active production in Ukraine; prior to war, domestic demand was covered by Russian plants → now direct supplies from EU are in place • Demand for sheet glass during the reconstruction phase expected to be at least **27m sqm per year**	• City One Development, a glass plant with output of 15-16 m sqm in Kyiv region (in construction) • Intention to build a second plant from City One Development (15-16m sqm as well) until 2025
Concrete	• Over 300 producers, capacity 12m m^3 per year. Production is highly centralised with 6 major companies in Kyiv producing over 7m m^3 • Expected reconstruction demand **is 22m m^3 per year**	• New aerated concrete block factory in Lviv from PBG Kovalska • New plants required in eastern and southern regions due to logistics
Cement	• There are 10 cement factories in Ukraine, with a total production capacity of 13 million tons per year (CRH, Dyckerhoff, Heidelberg, IvanoFrankivsk, Balcem, KRcement). Demand for 2023 is estimated at 6 million tons • Expected demand during recovery period is **15–16 million tons per year**	• Dyckerhoff plans 2 modernisation projects to increase capacity by 1.8 million tons (paused) • KRcement plans modernisation to increase output by 1.9 million tons. (paused)
Mineral wool	• There are 9 major mineral wool producers in Ukraine with total internal production capacity at 35 million m^2 per year. The 2 largest producers are IZOVAT (Obio) Zhytomyr and Techno Thermal (Sweetondale) Cherkasy • Expected demand during reconstruction is **50 million m^2 per year**	• Obio Company planned new plants with the capacity for 12 million m^2 before war (paused) • Kingspan group plans $280 million investment in Lviv for greenfield insulation materials facility
PVC profiles	• 14 major manufacturers, with a total capacity of 100,000 MT per year or 30 million linear meters. Miroplast LLC, Mayado LLC, and Viknaland LLC are the largest producers covering 80% of volume (of which 50% are damaged) • Expected demand for recovery period is **19.5 million linear meters per year**	• Viknaland has resumed operations after fast reconstruction. At Mayado situation is unclear. • Several smaller producers relocated to western Ukraine

Apart from the direct opportunities in building materials, there is also potential in providing associated machinery and technologies used in the respective value chains – potential opportunity for Finnish businesses given their strong position in such areas

Source: USAID report "*Activating and Strengthening Ukraine's Reconstruction Capacity*", public announcements, CIVITTA analysis

B3

\ BUILDING MATERIALS (BACK-UP): SOME PLAYERS HAVE ALREADY ANNOUNCED THEIR PLANS TO INVEST IN PRODUCTION OF BUILDING MATERIALS IN UKRAINE

Disclaimer: Selected publicly announced cases

Foreign players

FIXIT GRUPPE – BAUSTOFFE MIT SYSTEM

Construction mixes

Status quo:
- In 2008, opened the first factory in Fastov
- In 2021, laid the foundation stone for the plant in Lviv and opened a wet production in Fastov plant

Announced plans/intentions:
- Announced doubling the production in Ukraine (as of Apr 2023)
- Additional **EUR 7 million** investment to new Lviv plant
- Received investment insurance from German government

Kingspan

Insulation and district heating

Status quo:
- Kingspan operates in over 80 countries, with 212 production facilities, employing over 22,000 thousand people
- No current production in Ukraine

Announced plans/intentions:
- Announced plans to build greenfield production facility in Lviv region in 2022
- Planned investment over **EUR 200 million**
- Over 600 jobs will be created
- Project currently in planning phase (supported by UkraineInvest agency)

Local players

AQUAIZOL®

Rubber and bitumen roofing

Status quo:
- Company was operating in Kharkiv since 1998
- Produces 33 various products
- European certified products

Announced plans/intentions:
- Decided to relocate production of raw materials to Kalush in 2022
- New raw materials plant being built (using relocated equipment and key specialists) with plans to finish in September 2023 and to employ over 100 people

KOVALSKA

Concrete, mixes, development

Status quo:
- Holding company based in Kyiv. One of market leaders in concrete production
- Additional products include building mixes, pavement, concrete blocks

Announced plans/intentions:
- In 2023 announced plans to build new aerated concrete block factory in Lviv. Received **EUR 27 million** loan from Dutch Good Growth Fund.
- In 2023 acquired companies and equipment for 1 million tons of sand mining in Dnipro and Desna rivers

Source: Public announcements

B4

\ FINANCING: THE PRE-WAR FINANCING MODEL WAS MOSTLY BASED ON PRIVATE AND PUBLIC SOURCES WITH LIMITED CREDIT FINANCING

FINANCING MODELS OVERVIEW (BY CONSTRUCTION TYPE)

	Residential	Commercial and Industrial	National Infrastructure	Social Infrastructure
Before the full-scale invasion	• Acceptable ROI for developers was at ~12% • **Developer funded the land, licensing, and foundation works,** then opening sales of apartments (at lower sqm price) and **utilizing funds of customers to complete construction** • Private houses and townhouses were mostly completed by developers and sold only at final stages	• Construction of factories, malls, supermarkets, offices, hotels, was primarily **funded by private investors with private banks providing loans**	• Government infrastructure was financed **from the national budget through agencies and state-owned companies**. E.g., the government spent $4.7 billion on roads in 2021 • **State owned banks provided loans to major state bodies** such as the UkrAvtodor roads agency for major projects. In 2021 UkrEximBank provided $376 million at 4.9% APR for roads • Tenders run via Prozorro	• Social infrastructure such as schools, kindergartens, sports facilities, parks, and public buildings **was financed from local budgets of municipalities and cities**, with certain projects receiving **subventions from the national budget** • Tenders run via Prozorro
War ramifications	• Previous financing model is not operable, and developers are completing old projects with limited plans for expansion • Access to loan financing from banks is limited due to Central Bank policy & lack of pledge possibility (no ownership rights before construction completion)	• Overall activity is mostly on pause across sectors • New REIT model is currently starting in Ukraine to attract retail investors into commercial and hotel projects offering 7-10% ROI in USD	• No major changes so far, except for greater participation of international donors in financing construction of certain objects	• No major changes so far, except for greater participation of international donors in financing construction of certain objects

The government has been implementing the **eOselya Mortgage Program** *(more details on the next slide)* to address housing challenges and stimulate private demand that will support residential construction

Post-war

Public funding (e.g., through public tenders in Ukraine, tenders of international financial institutions, and other public agents) is anticipated to be pivotal in the reconstruction process. At the same time, private capital (investments by companies such as int'l Kingspan or local Kovalska, etc.) will also play a substantial role in the rebuild, generating extra demand within the construction industry . However, at this moment, the expected split between public and private sources remains unclear

B4

\ FINANCING (PUBLIC FUNDING): THE RECONSTRUCTION NEEDS FINANCING MODEL IS STILL WORK IN PROGRESS; ONLY SOME PRELIMINARY OUTLINES ARE AVAILABLE

PRELIMINARY (POTENTIAL) FRAMEWORK FOR THE RECONSTRUCTION NEEDS FINANCING

Funding sources

Pledged:
- IFIs: EBRD, EIB, IFC, WB
- Foreign governments: EU and NATO member states, allies of Ukraine
- UA national and local budgets
- UA private companies & investors

Both directly or through intermediaries (e.g., development agencies such as USAID)

Potential:
- Int'l private corps. and investors
- EU Structural Funds

Coordination

Int'l: Multi-agency Donor Coordination Platform: consists of IFI, International Governments, and EU Commission Representatives with Ministry of Finance of Ukraine to allocate macro-financial assistance

Ukrainian:
- Ministry for Restoration (former Ministry of Infrastructure)
- Agency for Restoration (former UkrAvtoDor roads agency)
- Budget programs and specific funds (e.g., Fund for Liquidation of War Effects)

Agency for Restoration is assumed to take upon the role of ''customer'' while local authorities are expected to provide reconstruction needs and submit their projects

Digital operating system

- DREAM (Digital public reconstruction ecosystem) platform was created by the Ministry for Restoration to manage all national and regional recovery projects. All national and municipal projects are required to be uploaded to the system to receive funding
  - Funding will be allocated by prioritization
  - The system will be utilized to provide transparent projects, documentation, and key metrics for donors
  - The data fulfilment is currently estimated at 50%; the full-scale launch is expected by the end of 2023
- DREAM will continue to utilize Prozorro tender platform for procurement of services and materials
- Business opportunities on all tenders should be publicly available for all projects

Website links for the Ministry, Agency, DREAM, and others are provided in Appendix 3

- Apart from the above, to stimulate private demand, the government introduced **eOselya Mortgage Program –** public mortgage program for purchasing of housing for soldiers, veterans, IDPs, medics and social workers at 3-7% APR, with the rate differences compensated to banks from the budget
- However, RE developers indicate that program has limited effect on sales on primary market due to issues with ownership rights registration prior to construction completion and the need for UkrFinZhitlo (state mortgage entity) to reach an agreement with the banks on risk management

Source: CIVITTA Analysis

FINANCING: AGENCY FOR RESTORATION IS EXPECTED TO BE A MAIN PARTNER FOR LOCAL AUTHORITIES IN IMPLEMENTING RECONSTRUCTION PROJECTS

Government / National level

Ministry for Restoration of Ukraine

- Collects and assesses the needs of all regions and sectors
- Determines priority projects, in accordance with the strategic priorities of the Government
- Approves the Action Plan of the Agency for Restoration

Agency for Restoration

- Plans and ensures efficient and transparent implementation of projects
- Takes over the functions of the customer from the initiators of the projects, and after the completion of the project, returns the object to the balance sheet of the local self-government body

Local level

Local authorities

Regional military administrations, local self-government bodies, communal enterprises

- Keep track of information on the destroyed objects and the priority needs of recovery for the region/area
- Submit applications for reconstruction projects to the Ministry

Recovery Services Department

Structural part of the Agency for Restoration at the local level

- Collect information and destructions and reconstruction needs in each separate region
- Help local authorities develop projects for subsequent submission
- Ensure logistics on the liberated territories

DREAM digital system + Prozorro procurement system

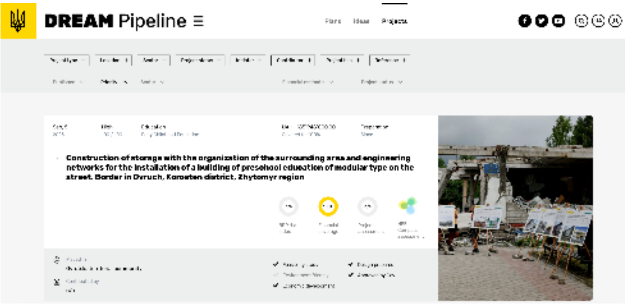
Source: State Agency for Restoration of Ukraine

B4 \ FINANCING (BACK-UP): DREAM (DIGITAL RESTORATION ECOSYSTEM FOR ACCOUNTABLE MANAGEMENT) IS BEING BUILT TO SUPPORT (RE)CONSTRUCTION PLANNING

PURPOSE

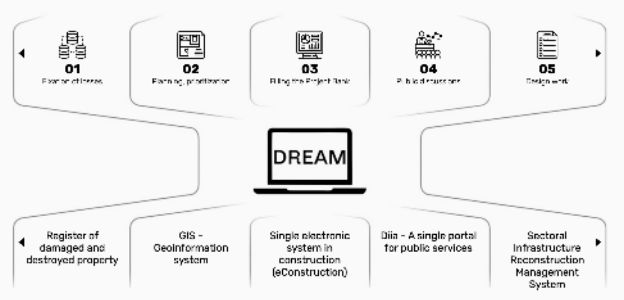
- Consolidate data for projects planning and prioritization from local government to the central government through the Ministry for Restoration
- Provide transparency for international donors and public
- Standardize documentation and reporting
- Act as an umbrella for unification of data registers
- Manage the execution of projects
- Provide opportunities for communities to present their projects

EXPECTED MODULES



- **Pipeline** of projects from communities for reconstruction, repair or new objects and infrastructure
- Damage and **needs matching** overview
- Register of project implementation **administrative units** (local government)
- Register of **financial contributors** to projects (IFIs and Governments)
- Categorization by **sectors, regions and types of construction**
- **Business opportunities**: public tenders for procurement of materials and services linked **to Prozorro system**

PROJECT STAGES IN DREAM



1. Fixation of losses and assessment of needs
2. Development of smart recovery plans
3. Project initiation and preparation
4. Data input to Project Bank
5. Identification of financing mechanisms from public, private or international
6. Preparation and conducting procurement through Prozorro system
7. Projects implementation and interim reporting
8. Audit and control of implementation including review of documentation

The development of DREAM is funded by the UK International Development agency

UK International Development
Partnership | Progress | Prosperity

Multiple other international support organizations, e.g., GIZ, USAID, etc., provide their support as well

Source: Ministry for Restoration, DREAM website

B4

\ FINANCING: REGIONAL RECOVERY WILL BE A MAJOR FOCUS OF UKRAINIAN APPROACH AS FIGHTING CONTINUES IN THE EAST AND SOUTH

MAP OF DONORS (PLEDGED AND PENDING) BY REGION AS OF FEBRUARY 2023

\ CONSTRUCTION WORKS: RESIDENTIAL AND COMMERCIAL CONSTRUCTION IS EXECUTED BY A FRAGMENTED MARKET OF CONTRACTORS, INFRASTRUCTURE IS MORE CONSOLIDATED

	Current situation	Major Players
RESIDENTIAL SECTOR	• **Large development companies often operate associated general contractors** to manage risks and financing • Construction works executed by **thousands of SME sub-contractors** in highly fragmented market	**Selected large national brands (Own-Contractor):** • KAN: **Kanbud** • Stolitsa group: **Stolitsa** • Zhitlobud-1: **Zhitlobud-1** • Integral bud: **Integral bud** • Kyivmiskbud • Perfect G • Riel • UDP
SOCIAL & COMMERCIAL	• Dominated by **numerous local sub-contractors** hired through public tenders or property owners • Market is split by **specializations** into agricultural, industrial, trade and general	**Public procurement leaders:** Largest players in 2021 by tenders won: • Autostrada – EUR 1.44 bn • Automagistral – EUR 1.35 bn • ONUR Group (Turkey) – EUR 0.8 bn • RDS – EUR 0.8 bn Selected specialized tunnel and bridge companies: • Metrobud • Adamant • Interbudtunel
INFRASTRUCTURE	• Market is **consolidated by a dozen majority local players** who bid for public tenders • Large contractors operate equipment, specialists, working capital, asphalt plants	

Key challenges mentioned by industry players in residential space:

Operational and cost-related:

- Cost fluctuations for materials
- Air raids and electricity blackouts (affecting labour hours and efficiency of work)
- Insolvency of contractors
- Lack of workforce

Regulation-related:

- Connection to utilities (during planning and after)
- Unexpected changes to regulations

(!) Licensing of construction companies:

During the martial law, licensing for CC2 and CC3[1] construction is replaced with submitting declaration on performing construction activities (digitally or physically); after the end of martial law, companies will need to receive a proper license, but no procedure has been developed so far. CC1 construction does not require a license

Source: LUN, Orbis, Industry interviews, CIVITTA Analysis

1 – Construction is split into 3 hazard classes based possible consequences for health and life of persons who are staying permanently or temporarily at or outside the construction object, quantification of possible material losses, and possibility of losing a cultural object or transportation infrastructure

C

\ CONSTRUCTION WORKS (BACK-UP): SNAPSHOT ON SELECTED MAJOR PLAYERS

SELECTED PLAYERS IN RESIDENTIAL SPACE

KANBUD

A full-service Ukrainian construction company (part of KAN) that carries out projects of varying scale and complexity

Selected projects:

- Residential complexes “Comfort Town”, ‘’Parkove Misto”, ‘’Central Park’’, etc.
- Private schools under Academy A umbrella
- Business centers, e.g., ‘’IQ’’

Stolitsa Group

One of the leading developers on the Ukrainian market of modern real estate, with affiliated construction contractor

Selected projects:

- Residential complexes “Lipinka”, ‘’Warsaw”, ‘Galaxy’’, ‘’Seven’’, etc.

SELECTED PLAYERS IN INFRASTRUCTURE SPACE

Autostrada

A leading road construction and maintenance company in Ukraine

Selected projects:

- Roads and bridge crossings across whole Ukraine (e.g., 800km of roads and 50 bridge crossings repaired in 2021)

Onur

A Turkish company specializing in the construction and reconstruction of highways, bridges, junctions and roads

Selected projects:

- Chop-Kyiv national road renovation
- Renovation of city infrastructure in Lviv
- Bridge construction across Dnister

Source: CIVITTA Analysis

SELECTED EXAMPLE PROFILES

C

\ PREFAB MARKET DEEP-DIVE: THE UA MARKET INCLUDES MANY SMALL LOCAL PLAYERS THAT FOCUS ON SMALLER-SCALE CONSTRUCTIONS (E.G., PRIVATE HOUSES)

Origins

- **The prefab market started to emerge in early 2000s** – mainly included manufacturers of houses based on containers, metal structures, and wooden structures
- **In the period from 2011 to 2020, new companies entered** – the ones focusing on SIP-panel, CLT-panel construction technologies; new developments in of prefabricated houses using straw, reed, technical hemp, etc.

Market structure status quo

Total # of companies in Ukraine *(as of Mar 2023)*: 300+

# of companies that have at least some activities related to prefab – not always the core activity; also, large share of the market is in shadow economy

… by company size

Medium-sized	6%
Small-sized	94%

… by product type

	Wooden frames	Metal frames	Total
Prefab structures	24%	22%	46%
Modular buildings	18%	13%	31%
Other (SIP, CLT, etc.)			23%

… by region of registration

Kyiv region	46%
Other regions	54%

… by scale

The absolute focus is **on smaller-scale constructions** (private houses) rather than multistorey buildings

Latest developments

- According to the Prefabricated Buildings Association of Manufacturers, **in 2021-2022, 71% more producers registered than in the previous two years**. This is accompanied by an increased demand for objects of rapid construction
- Prior to the war, the major driver was private demand for countryside houses at a moderate price point
- During the war, the demand is supported by increased need for quick accommodation provision

Current challenges for prefab manufacturers in Ukraine include:

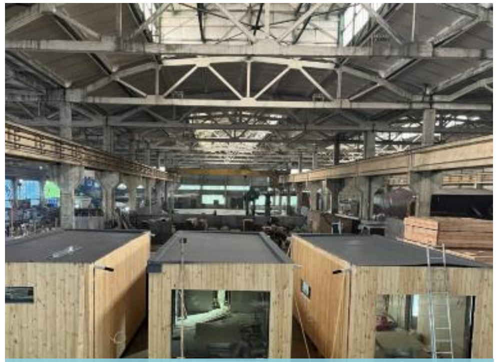
- Lack of prefab definitions in UA construction regulatory norms; some norms are outdated
- Lack of regulations to ensure the "rules of the game" and provide training for producers. This creates opportunities for dumping and discrediting the technology by individual business representatives
- Availability and prices of building materials (incl. logistics)

C

\ PREFAB MARKET DEEP-DIVE: THERE ARE ONLY FEW LOCAL PLAYERS THAT ARE ACTIVE IN LARGER-SCALE PREFAB TECHNOLOGIES – POTENTIAL WHITESPACE IN THE FUTURE

Most of UA players focus on smaller-scale prefab solutions...


Temporary housing for mothers & children (1/2)


Unitfab company production


Temporary housing for mothers & children (2/2)


Unitfab house in V. Dymerka

ILLUSTRATIVE SMALL-SCALE PREFAB PROJECTS

… while larger-scale prefab construction remains a potentially attractive whitespace


Existing wall module technology by Royal House


Well-being ConTech technology by BK Budova

SELECTED EXAMPLES OF LARGER-SCALE PREFAB TECHNOLOGIES IN UA

UA industrial giant – Metinvest – has been also developing concepts for prefab construction – esp. utilizing metal frames

\ SUSTAINABILITY: UKRAINE STARTED ITS JOURNEY IN SUSTAINABLE CONSTRUCTION FROM ENERGY EFFICIENCY – FOR PROMOTION OF WHICH SPECIFIC MECHANISMS ARE IN PLACE

MODEL OF SUSTAINABLE DEVELOPMENT IN CONSTRUCTION

Principle of the future:
Minimization of the use of environmental resources for future development

Principle of environmental sustainability:
Preservation of ecosystem, energy, and other resources

Principle of public participation:
Involvement of construction experts in decision-making on sustainability development

Principle of equity:
Equity in the production of sustainable materials and equal access to the materials and natural and local resources

COMMENTS

- The Cabinet of Ministers has adopted the Concept of State Policy on Ensuring the Energy Efficiency of Buildings in 2020 and **several related regulations have been adopted since then**
- In 2021, The Cabinet of Ministers adopted the requirement that in new and renovated objects after reconstruction or capital repair, the **energy efficiency class must not be lower than "C"**
- Prior to that, the Cabinet of Ministers approved the entire country to reduce carbon emissions by 65% from the 1990 level by 2030
- Despite ambitious goals, the country mainly focuses on energy efficiency while **paying less attention to other areas of sustainable construction**
- Nevertheless, there are individual enthusiasts who develop "green" objects, confirmed by the relevant certificates (LEED, BREEAM). However, the **mass adoption of these principles is still pending**

To support energy efficiency improvements, Ukraine implemented **the ESCO mechanism** that allows public organizations to pay private contractors for energy improvements through saved energy bills. About 600 ESCO contracts have been implemented for a total amount of over Euro 40 million so far. → **opportunity for foreign businesses to provide technologies & solutions on a commercial basis**

Sources: Epravda, Rada.gov, Decentralization.gov.ua, Ecopolitic

D

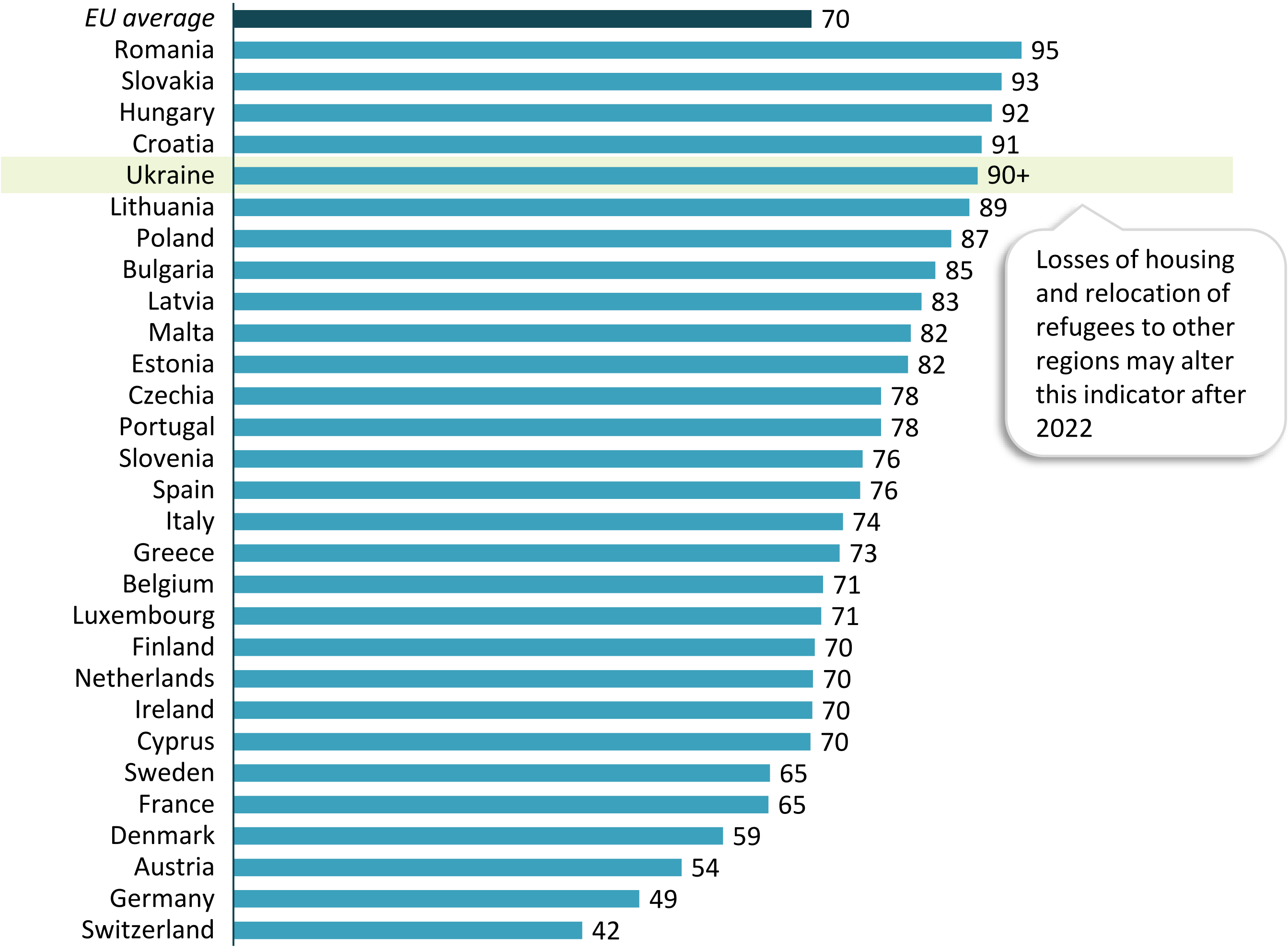
\ REAL ESTATE OPERATIONS: THE REAL ESTATE MARKET HAS BEEN SIGNIFICANTLY HIT BY THE WAR, BUT HAS BEEN SLOWLY RECOVERING, ESPECIALLY IN THE WESTERN PARTS OF UKRAINE

		Pre-war situation	Changes during 2022-2023
RESIDENTIAL	**PRIMARY MARKET** *(Sales from development companies)*	• 14% price growth in 2021 with a stable growth rate of 5-7% earlier	• **The demand has sharply decreased** – by around 70% in 2022 in comparison with 2021 and it is expected that in 2023, the demand will already be around 40% of the pre-war level • **The prices highly depend on the region**; however, prices in Kyiv are already (as of August 2023) similar to the pre-war prices in some segments • **Buyers as well as developers are more active in the Western regions of Ukraine** due to the comparative safety • **Buyer profile has changed** due to invasion and now includes IDPs and relatives receiving deceased soldier's compensation
	(both markets)	• Low square footage per person – 24m^2 per capita while almost 48 m^2 – in Germany • High mortgage potential – household debt/GDP was 4.7%, while approx. 57% for Germany • Housing in Kyiv was on average twice as expensive as in the regions • Foreign investors were entering the market – 10% of all deals • Purpose of acquisition: 80% of deals – for living, while 20% - for investments	
	SECONDARY MARKET *(Sales from existing individual owners)*	• 16% price growth in 2021 with a growth rate of 5-11% earlier	
COMMERCIAL		• By the beginning of 2020, there was a severe shortage of commercial real estate due to the expansion of both local and international brands in Ukraine • However, as a result of pandemic, the demand dropped both in the office and commercial segments, thus causing the rental price decrease by approx. 20% in 2020 and keeping stable in 2021	• **Commercial real estate was impacted by the general macroeconomic trends in the country** – consumption has dropped due to migration and hostilities, especially in the East while only partially affecting Western regions • **Many commercial projects put on pause due to hostilities**

Source: The Wandering Investor, MinFin, Realting, the Page, KSK, Colliers, Ukrainian Council of Shopping Centres

\ REAL ESTATE OPERATIONS (BACK-UP): MANY UKRAINIANS OWN THEIR LIVING SPACE – RESULT OF PREVIOUS POLICIES AND ABSENCE OF ALTERNATIVE FINANCIAL INSTRUMENTS

SHARE OF PEOPLE LIVING IN HOUSEHOLDS OWNING THEIR HOME, EUROSTAT, %, 2021



Over ~90% Ukrainians own the houses that they live in. This can be attributed to a couple of **reasons**:

- A legacy of the **Soviet and post-Soviet policies** from 1990s – when people were granted real estate ownership rights, e.g., through privatization
- Real estate market is considered as an **alternative to other saving strategies** → i.e., people tend to invest in ownership of accommodation as a safe alternative to store money

Source: Eurostat, Cedos, Ukrstat

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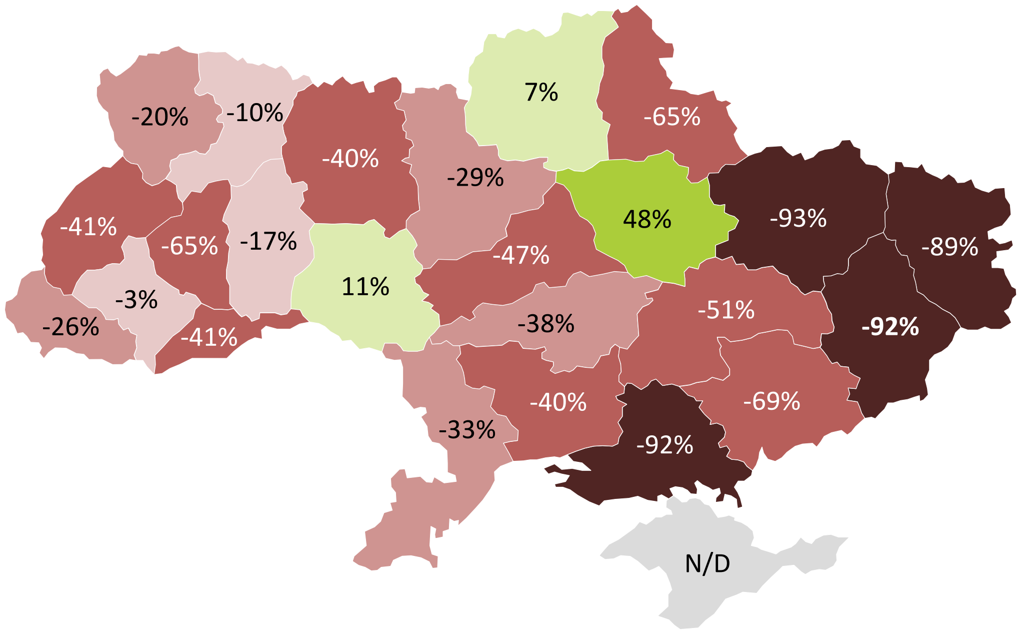
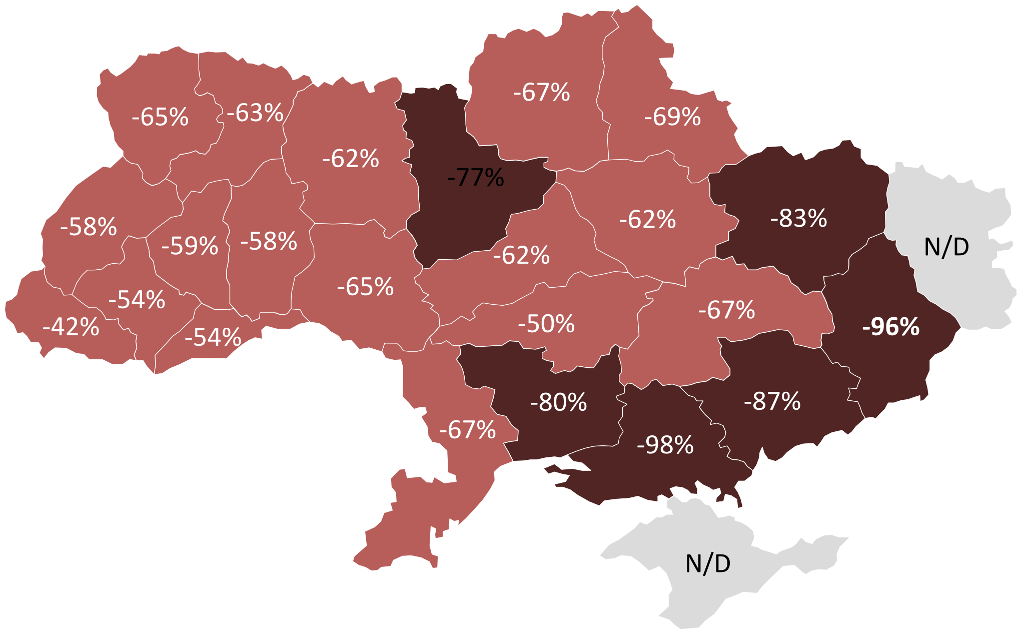
\ REAL ESTATE OPERATIONS (BACK-UP): THERE HAS BEEN A SIGNIFICANT FALL IN ACTIVITY BOTH ON THE PRIMARY AND SECONDARY MARKETS IN UKRAINE DUE TO THE WAR

CHANGE OF OFFERING VOLUME ON THE PRIMARY, 2022 VS 2021, %



Positive change is likely the result of low base value

CHANGE OF TRANSACTIONS VOLUME OFFERING ON THE SECONDARY MARKET, 2022 vs 2021, %

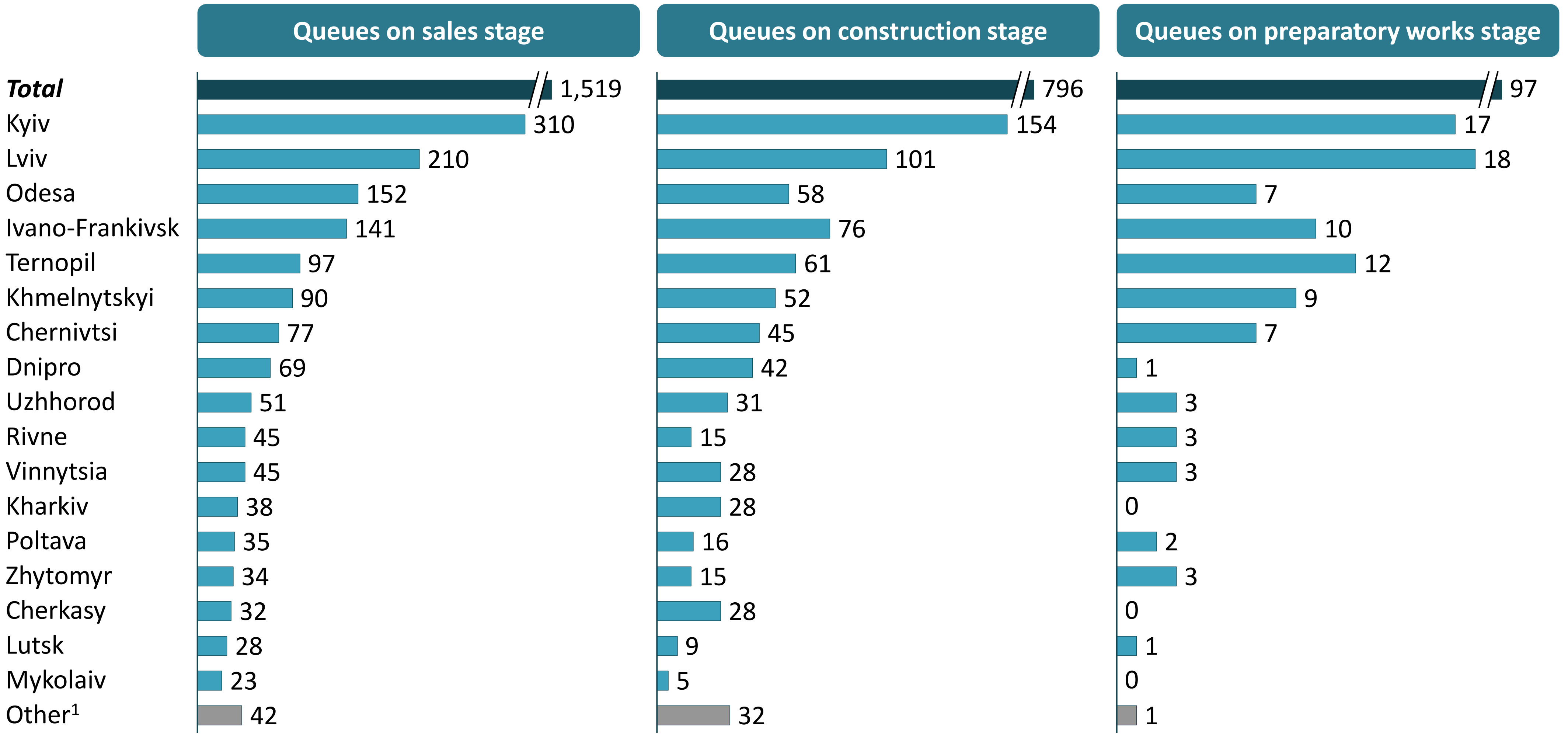


- > +40%
- +0-40%
- -0-20%
- -20-40%
- -40-70%
- -70-100%

Source: Forbes UA, EY

\ REAL ESTATE OPERATIONS (BACK-UP): RECENTLY, RESIDENTIAL CONSTRUCTION HAS BEEN CONCENTRATED AROUND BIGGER CITIES AND IN THE WESTERN PART OF THE COUNTRY

CONSTRUCTION QUEUES IN SALE, CONSTRUCTION, AND PREPARATION ACROSS REGIONS, 2023



Source: LUN

1 – Chernihiv, Zaporizhzhia, Sumy, Kropyvnytskyi, Kherson

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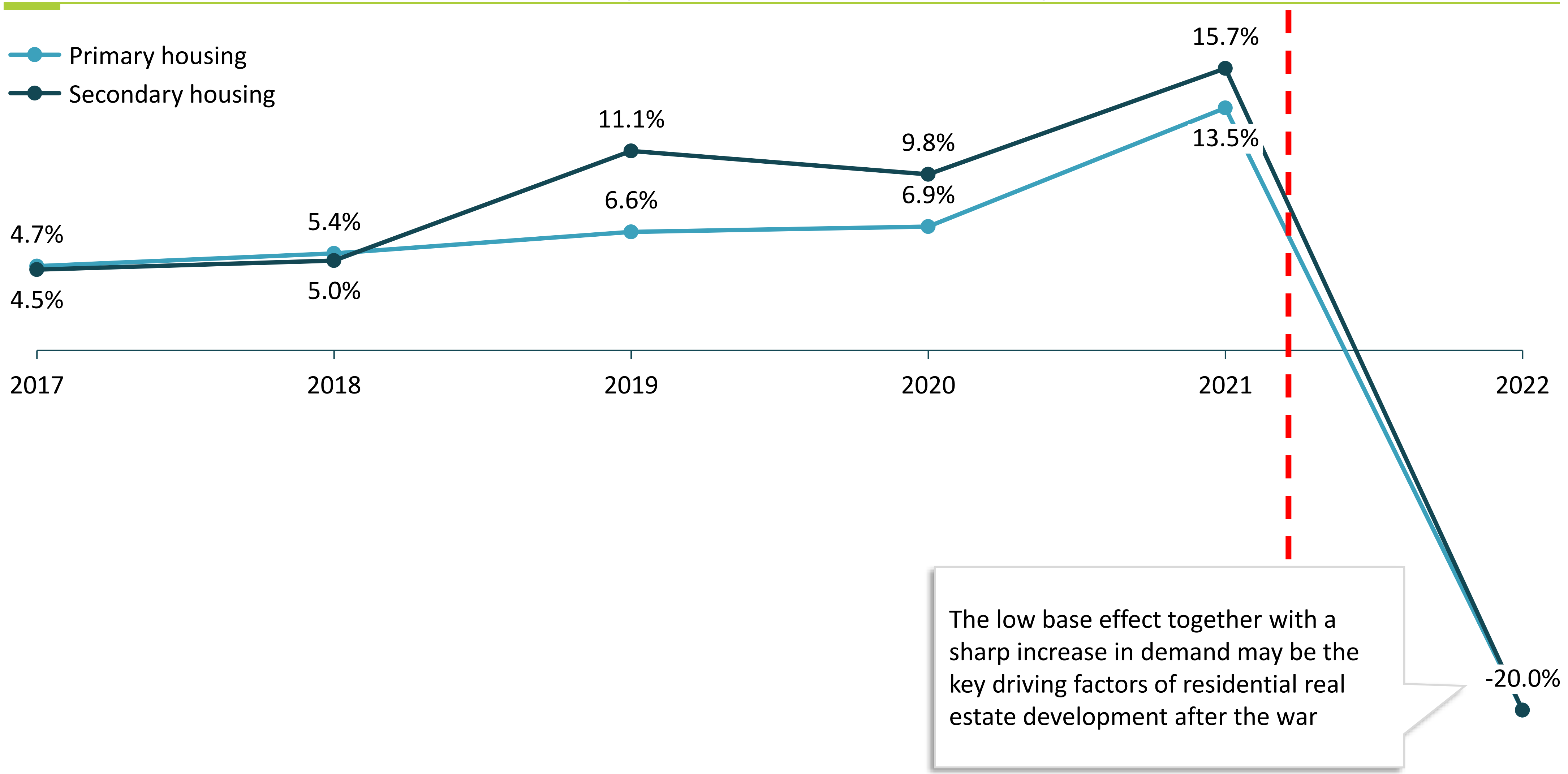
\ REAL ESTATE OPERATIONS (BACK-UP): RESIDENTIAL RE PRICES GREW BEFORE THE WAR AND MAY GROW EVEN FASTER AFTER DUE TO INCREASED DEMAND AND LOW BASE EFFECT

RESIDENTIAL REAL ESTATE PRICE GROWTH IN 2017-2022, EXCLUDING OCCUPIED TERRITORIES, %

2022 - ILLUSTRATIVE



Source: Ukrstat

E \ SERVICE & MAINTENANCE: RESIDENTIAL HOUSING MANAGEMENT MODEL IS EVOLVING AWAY FROM CENTRALISED TOWARDS MARKET ORIENTED ONE

RESIDENTIAL REAL ESTATE MANAGEMENT MODEL

Historical model

All RE and infrastructure managed by public authorities and administrative units (ZKH) as a Soviet legacy

Current model

State-Owned Communal Management Entities (Legacy)

OR

Private Management Companies

OR

Unions of Apartment Owners (if established by 75% majority)

The largest private residential management companies are:

- Misto dlya Ludey (~9million m2)
- Dim9000 (~1million m2)
- KomfortTown
- Kovalska
- KAN
- Checkdom
- Atmosphere

Private company **APPOINTMENT MECHANISMS**:

- Collective formal agreement of 75% of owners (If there is no established Union)
- Directly by the Head of the Union of Apartment Owners
- By RE developer (a rare case – only if RE developer still holds ownership rights for apartments)

ONGOING REFORMS:

- Buildings that do not have an established management model will be put on public tender 6 months after the cancelation of martial law
- Apartment owners will be able to create Unions and sign collective agreements through email and electronic signature

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\ SERVICE & MAINTENANCE (BACK-UP): SELECTED MAJOR PLAYERS IN THE RESIDENTIAL SPACE

MISTO DLYA LUDEY

One of the largest residential property management company present across multiple cities in Ukraine

Scope of activities:

- Was present across 8 cities before the war; now 3 out of 8 are under Russian occupation
- Services include maintenance, cleaning of houses and local areas, maintenance of elevators and electrical networks, repairs, general house management

DIM 9000

A new property management company, founded in 2021 that specializes in the management of multi-apartment buildings and surrounding areas

Scope of activities:

- Present in residential objects in Kyiv – usually newly constructed residential complexes
- Provides a full range of facility management services for residents

COMFORT-TOWN

A property management company situated in Kyiv providing a variety of services from design to post-commissioning operations

Scope of activities:

- Present in 3 newly constructed residential objects in Kyiv, Comfort Town being the biggest out of those
- Provides a full range of facility management services for residents

CIVITTA

Source: CIVITTA Analysis

SELECTED EXAMPLE PROFILES

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\ SERVICE & MAINTENANCE: PRIVATE RESIDENTIAL MANAGEMENT COMPANIES FACE A VARIETY OF CHALLENGES, BUT ARE READY TO ADOPT INNOVATIONS IN THEIR OPERATIONS

CHALLENGES

Primary challenges named by management companies:

- Negotiations with electricity suppliers and local authorities (e.g., on tariffs, supplies, etc.)
- Lack of specialists (e.g., some staff are at war or have emigrated outside of Ukraine)
- Supply of spare parts for equipment (esp. for more advanced systems – e.g., heating stations)
- Lack of reserve funds
- Getting formal approval for managing the building (as 75% of owners' votes are required usually)
- Insolvency of customers

INNOVATION OPPORTUNITIES

1. **E-Democracy**
2. **Waste Management**
3. **Energy Supply**
4. **Water Filtration**
5. **Security and Bomb Shelters**

There is also a new regulation in place that new residential constructions should pre-plan and include shelters

! According to the available data, the **debt for service payments amounts to $1.1 billion**, as of January 1, 2023, (excluding the temporarily occupied territories of Crimea, Donetsk, Luhansk, Kharkiv, and Kherson regions). The amount owed includes $750 million for the supply of heat and hot water; $200 million– for centralized water supply and drainage; $50 million for waste management; and $100 million for apartment building servicing

Source: Industry interviews, CIVITTA Analysis

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SERVICE & MAINTENANCE: THERE IS NO UNIFIED APPROACH TOWARDS SERVICING AND MAINTAINING NON-RESIDENTIAL REAL ESTATE

CURRENT MODEL FOR SERVICING AND MAINTAINING NON-RESIDENTIAL REAL ESTATE

National and municipal infrastructure

Managed by official departments that hire private and state-owned service companies through tenders for maintenance works

Critical Infrastructure

Maintained by state-owned or private companies who usually own the assets through a mix of in-house services and subcontractors

Industrial and Commercial Assets

Managed by companies that own the assets, which hire subcontractors for specialist functions. Commercial asset management conducted by market of specialist companies

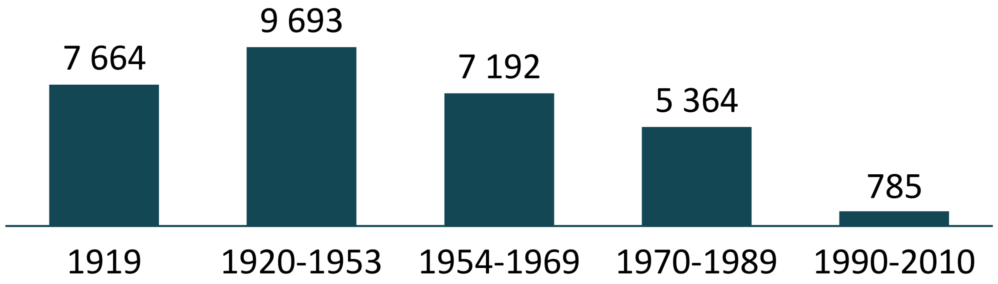
\ END OF LIFE: DEBRIS[1] ACCUMULATION FROM WAR AND AGING RESIDENTIAL STOCK IS LIKELY TO GENERATE DEMAND FOR RECYCLING SERVICES

WAR RELATED CONSTRUCTION DEBRIS[1]

- **60,000 separate objects** are damaged or destroyed as of July 2023
- Construction waste volume estimated at **450 k tons**
- Primary **Regions** of waste location: Kyiv (185 k tons), Zhytomyr, Sumy, Mykolayiv, Chernihiv, Kharkiv
- Data for Kherson, Zaporizhya, Donetsk and Luhansk is limited due to ongoing hostilities

AGING BUILDINGS AND INFRASTRUCTURE

- 24% or ~**6,700** of Ukraine's 28,000 **bridges** are in obsolete condition as of August 2023, out of which 9% are critical
- Large volumes of **obsolete industrial buildings** (from Soviet times)
- **30,698 multi-apartment buildings** in the country were classified as obsolete (in 2019); split by years of construction:



ONLY 6% OF CONSTRUCTION WASTE IS RECYCLED IN UKRAINE

- Sorting complications: dangerous substances which are mixed with all the materials and include asbestos (banned from 2022 by law for utilization in construction), gunpowder, batteries, electronics
- Existing Ukraine's landfills are mostly overfilled and there is no more physical space to store the construction waste even temporarily

1 – Debris means the remains of buildings and other structures broken down or destroyed due to war hostilities

Source: Ministry of Ecology, Ukrstat, Bridges Inspection Commission under the Ministry for Restoration

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\ END OF LIFE: INDUSTRY PLAYERS HAVE DEMONSTRATED INTEREST TOWARDS CONSTRUCTION WASTE RECYCLING AND INDUSTRIAL CONVERSION PROJECTS

ANNOUNCED WASTE RECYCLING PILOT PROJECTS IN UKRAINE

neo-eco
світ без відходів

French circular economy company Neo-Eco that specializes in sustainable engineering and creating eco-materials processed 15 000 tons of construction waste in Hostomel (Kyiv Region)

GREENMIX

Israeli company GreenMix that specializes in the recycling of construction and demolition waste announced plans to build a plant for ecological processing of construction waste in Kyiv Oblast

LIETUVOS GRIOVĖJŲ ASOCIACIJA

Lithuanian Demolition association together with Waste Recycling Association Of Ukraine and mayors of Irpin and Bucha signed a memorandum to build a mobile demolition and construction waste processing site

SELECTED EXAMPLES

+

COMPLETED INDUSTRIAL CONVERSION PROJECTS

- Industrial enterprises in Kyiv and Kharkiv and other cities of Ukraine have been demolished and replaced by commercial, education, co-working and other facilities
- Examples include UNIT city, COSMO mall, ARSENAL factory was renovated and turned into Kyiv Food Market, offices and commercial spaces, ART Zavod Platforma, GARAGE gastrohub, ART Zavod Mechanika Kharkiv, etc.

In 2022 the government approved the "Procedure for Waste Management Generated by Damage (Destruction) of Buildings and Structures as a Result of Hostilities, Terrorist Acts, Sabotage or Works to Eliminate Their Consequences." This document regulates waste management issues and complies with EU regulations to stimulate recycling and re-use. However, the by-laws were not developed which hampers enforcement and execution, leading to continued utilization in landfills

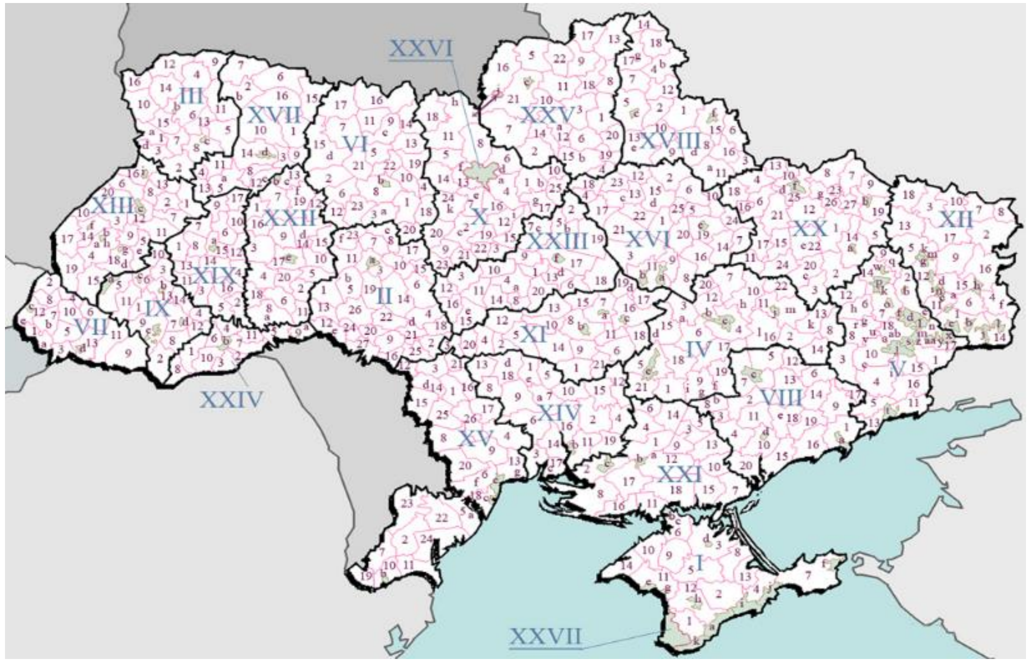
AGENDA

1. Introduction and methodology
2. Summary findings
3. Intro to recovery needs of Ukraine
4. Construction industry performance in Ukraine
5. Built environment value chain in Ukraine
6. Appendix materials

APPENDIX 1: UKRAINE IMPLEMENTED A LARGE DECENTRALIZATION REFORM, WHICH TRANSFORMED ITS ADMINISTRATIVE-TERRITORIAL SPLIT

2015-2020 UKRAINIAN ADMINISTRATIVE-TERRITORIAL REFORM

Ukraine has inherited **the old territorial split** into 490 Raions from the Soviet times



In 2020 year, 1469 amalgamated hromadas – the smaller territorial units with a higher degree of power for local councils and administrations were introduced during the reform

Similar to “Kunta” in Finland

Source: CIVITTA Analysis

\ APPENDIX 2: NEW URBAN DESIGN LAW #5655 HAS GENERATED HEATED PUBLIC DEBATE AMONG STAKEHOLDERS IN THE BUILT ENVIRONMENT INDUSTRY

The Parliament passed law #5655 on reform of city planning and design in 2022…

- The supporters include the current majority fraction in the Parliament, Cabinet of Ministers, and initially the Office of the President; the bill has been initially claimed to reduce corruption and support digitization of the entire permits and licensing process
- The law is aimed at granting more authority to the Ministry for Restoration in issuing documentation and inspections
- The law will allow for private companies to execute formal inspections in competition with state structures (adopted from UK practice)

…However, local government, city mayors, architects and activists have opposed the law

- The critics argue that the law will reduce the rights of local government and roll back on the decentralization reform, as well as grant more powers to the RE development players in appointing private inspection entities
- The local government will have limited rights in regulation of zoning and deciding what is built on land in their territories
- Opposing architects argue that development companies will be free to construct whatever they wish ignoring local facades and historical virtue

Because of the criticism, the President has neither vetoed nor signed the law into motion as of 14.09.2023. It is unlikely that the law will be signed in its current shape

Potentially, there could be an opportunity for Finland to promote its expertise in building regulation to Ukraine for its subsequent adoption by the latter

Source: Liga Zakon, BBC Ukraine, Cabinet of Ministers, CIVITTA analysis

\ APPENDIX 3: LIST OF USEFUL LINKS FOR FURTHER INVESTIGATION

Name	Link
Agency for Restoration	https://restoration.gov.ua/
DREAM	https://dream.gov.ua/
E-Construction portal	https://e-construction.gov.ua/
Ministry for Restoration of Ukraine	https://mtu.gov.ua/en/
National Statistics Bureau of Ukraine	https://www.ukrstat.gov.ua
Prozorro	https://prozorro.gov.ua/en
Rapid Damage and Needs Assessment (RDNA2) Report by World Bank	https://www.worldbank.org/en/news/press-release/2023/03/23/updated-ukraine-recovery-and-reconstruction-needs-assessment

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