

Asbestos-containing debris in Ukraine

ASSESSMENT REPORT

2024



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Abbreviations

ACM	Asbestos-containing materials
ADDRI	Asbestos and Dust Diseases Research Institute
CMU	Cabinet of Ministers of Ukraine
CSO	Civil Society Organization
EPR	Extended Producer Responsibility
EU	European Union
ISO	International Standards Organization
JICA	Japan International Cooperation Agency
KSE	Kyiv School of Economics
NGO	Non-governmental organization
NIP	Nomenclature of Industrial Products
OHS	Operational Health and Safety
PPE	Personal Protective Equipment
SNFI	Shelter and Non-Food Items
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WHO	World Health Organization

Executive summary

- Knowledge about asbestos in the debris from damaged infrastructure is one of the **information gaps** on the impact of the war in Ukraine. This assessment report has therefore relied heavily on proxy information based on the history of asbestos use in Ukraine, domestic production, imports of asbestos and the latest estimates of debris generation.
- Ukraine has a history of **asbestos use** in the construction sector, including roofing materials, insulation, pipework, etc. Ukrainian technical papers estimate that 70 per cent of roofs in Ukraine are covered with asbestos-cement slates. The estimated total area of roofs covered with asbestos-cement slates in Ukraine in 2014 was approximately 788.3 million m².
- The war in Ukraine is **generating debris** from destroyed infrastructure, buildings, facilities and residential areas. In January 2024, the Kyiv School of Economics estimated damage to at least 250,000 buildings, including 222,600 private houses, 27,000 multistorey buildings and 530 dormitories. The total damage to Ukrainian infrastructure is estimated at \$155 billion. Additionally, the country's power, gas and heating infrastructure alone has suffered over \$10 billion of damage. These estimates are likely to be an underestimate for current debris quantities, given the ongoing war. Updated debris quantifications are strongly recommended.

Key assessment from the regulatory framework

- The use of asbestos-containing materials in construction has only recently been effectively banned in Ukraine (Law of Ukraine on the Public Health System, 2022). There are now several regulations in place on asbestos and asbestos-containing materials and products, addressing working conditions, preventing exposure for workers and managing asbestos as hazardous waste.
- The guidelines currently available focus primarily on the collection, packaging and storage of asbestos and asbestos-containing debris, with no established standards for safely recycling or reusing asbestos and asbestos-containing debris.
- No clear regulatory framework exists for identifying asbestos in debris. The process is complicated by the various types of asbestos and the mixed nature of asbestos-containing materials in the debris.

Technical and management gap assessment

- Lack of experience within the public and private sector for safe and environmentally sound demolition, debris removal, debris disposal and debris recycling.
- No pre-war experience in construction and demolition recycling to draw on.
- Lack of facilities, heavy machinery and tools to carry out safe and environmentally sound demolition and debris management works.
- Lack of authorized and appropriate facilities to receive, store, process, treat and dispose of debris, including asbestos-containing materials.
- Lack of certified laboratories for quantitative and qualitative analysis of debris samples.
- There are currently very limited permitted and licensed landfill options to dispose of asbestos-containing debris in Ukraine.
- There is a significant shortage of qualified asbestos surveyors and contractors in Ukraine.

Public awareness gap

- Few Ukrainians have much awareness of the hazards and risks posed by asbestos.
- Outreach is needed to address the knowledge gap at all levels of society in Ukraine to help with enforcing regulations.

Summary for policymakers: asbestos-containing debris in Ukraine

The war in Ukraine has resulted in widespread destruction of civilian infrastructure, leaving significant amounts of debris in affected areas. A large portion of this debris contains asbestos, a hazardous material linked to severe health issues, including asbestosis, mesothelioma, and lung, laryngeal and ovarian cancers. This risk is particularly high due to the historical prevalence of asbestos in Ukrainian construction materials, with an estimated 70 per cent of roofs and other materials containing asbestos. Improper handling and limited public awareness further exacerbate the hazards. This document summarizes the findings and outlines actionable recommendations based on the report "Asbestos-containing debris in Ukraine."

Recommendations for policymakers

- **Develop national asbestos management guidelines:** establish specific procedures for identifying, handling, transporting and disposing of asbestos-containing materials.
- **Implement training programmes:** train workers and emergency responders on safe asbestos handling practices. This includes establishing technical working groups and certification for asbestos management professionals.
- **Public awareness campaigns:** launch educational campaigns to inform citizens and contractors about asbestos-related risks and protective measures.
- **Strengthen regulations:** review and enforce regulations on asbestos management to align with European Union (EU) standards, particularly as Ukraine progresses towards EU accession.
- **Allocate resources:** allocate dedicated funding for safe debris management, including the establishment of asbestos storage, treatment and disposal facilities.
- **Collaborate with international agencies:** partner with global organizations such as the United Nations Development Programme (UNDP) and Japan International Cooperation Agency (JICA) to address gaps in capacity and implement best practices.
- **Promote analytical capacity:** expand laboratory capabilities for asbestos testing and analysis, with an emphasis on achieving International Standards Organization (ISO) accreditation.
- **Emergency preparedness:** incorporate asbestos risk management into broader disaster response frameworks

Recommendations for the general public

- **Avoid handling debris:** do not attempt to remove or disturb suspected asbestos-containing materials.
- **Report hazardous sites:** notify the authorities about areas contaminated with asbestos for proper assessment and management.
- **Adhere to guidelines:** follow the instructions issued by local government authorities regarding debris handling and clean-up.
- **Seek medical attention:** contact health-care providers if asbestos exposure is suspected.
- **Participate in education:** engage in local workshops or community information sessions to understand risks and safety measures.
- **Support clean-up efforts:** volunteer with or donate to local initiatives aimed at managing asbestos debris safely.
- **Dispose of waste safely:** avoid mixing household waste with construction debris and use designated disposal sites.
- **Advocate for safer communities:** encourage local leaders to prioritize safe asbestos management and remediation.
- **Use personal protective equipment:** wear personal protective equipment, such as masks and gloves, when in proximity to asbestos-containing debris sites.
- **Spread awareness:** inform community members about asbestos hazards and safe practices.

Road map recommendations for the management of asbestos-containing debris in Ukraine (also in table 7):

<p>Short term</p>	<ul style="list-style-type: none"> • Establish a technical working group for asbestos-containing debris • Define requirements based on the UNEP assessment report and workshop held in Kyiv in July 2024, and initiate trials for handling debris • Prepare guidance on permits and licensing for asbestos storage, treatment and disposal facilities • Improve registers of asbestos-containing debris and war-damaged buildings within municipalities • Report the presence of asbestos to oblast authorities to determine asbestos management requirements • Ensure municipality debris management activities are performed safely with correct PPE, procedures and outputs • Establish and implement training courses on asbestos management for professionals • Review current and new regulations on asbestos management in Ukraine, with asbestos management professionals as an independent monitoring entity
<p>Medium term</p>	<ul style="list-style-type: none"> • Establish, maintain and operate required asbestos management facilities within oblasts with funding from central government • Establish and maintain a register of asbestos management facilities within oblasts • Mapping project to identify asbestos-contaminated areas, storage facilities and other tools • Establish and maintain a national centre for the management of asbestos, in consultation with the private sector • Prepare and disseminated training materials for asbestos management at all levels to the oblasts, municipalities and the private sector • Determine requirements for asbestos management facilities within oblasts, where municipalities may share facilities • Enforce relevant regulations concerning asbestos within oblasts, with inspectors and support for municipalities • Contribute to asbestos management reforms in Ukraine through participation in relevant technical working groups • Invest in asbestos management facilities once the regulatory framework has been reformed and enforced
<p>Medium term</p>	<ul style="list-style-type: none"> • Complete further regulatory reform to ensure Ukrainian management of asbestos-containing debris is aligned with applicable EU regulations to ensure EU accession

01 Introduction

Inhalation of asbestos fibres is known to cause lung, laryngeal and ovarian cancers, mesothelioma and asbestosis (WHO 2018). This risk is especially high when handling asbestos-containing materials, such as roofing sheets and insulation, particularly during demolition and debris removal.

The risks of asbestos exposure are also influenced by gender. Both men and women can be affected by direct occupational exposure, particularly from industry sectors involving asbestos (Walsh). Men are more likely to be exposed through occupational setting, while women may face a higher risk from domestic activities involving asbestos-containing materials in household products. Additionally, women can also be exposed indirectly when asbestos fibres are brought home from occupationally exposed relatives (Goswami).

Although Ukraine has enacted laws and regulations on asbestos management, these regulations still need to be strengthened. This includes defining thresholds to classify asbestos-containing debris, implementing ISO standards and laboratory equipment for asbestos analysis, creating waste disposal sites and developing appropriate State Construction Norms. While these new regulations will take time to implement, demolition and debris management continue in many municipalities with little regard for the risks posed by asbestos.

The war in Ukraine has led to widespread destruction, resulting in substantial amounts of debris. As of January 2024, the Kyiv School of Economics estimated damage to at least 250,000 buildings, including 222,600 private homes, 27,000 multistorey buildings and 530 dormitories. There has also been significant damage to businesses, shops, administrative buildings, kindergartens, medical institutions, cultural buildings and social facilities. Preliminary estimates place the value of damage to residential buildings at \$58.94 billion, which is more than a third of the total damage caused in Ukraine as of January 2024 (KSE 2024a). In total, the damage to Ukrainian infrastructure is estimated at \$155 billion, again as at January 2024, highlighting the extensive impact on various essential services (KSE 2024a).

By November 2023, the destruction had generated around 15.2 million metric tons of debris in the de-occupied territories of the Kyiv, Chernihiv and Sumy regions alone (Day 2023). Additionally, the World Bank's Rapid Damage and Needs Assessment Report (World Bank 2023) estimated the total cost for demolition and debris at \$11 billion, highlighting the safe handling of asbestos-containing debris as a current knowledge gap. These estimates are likely to be an underestimate for current debris quantities given the ongoing war, and updated debris quantifications are strongly recommended. Managing this debris in a timely, cost-effective and environmentally sound manner is crucial for the country's recovery efforts.

The presence of asbestos in the debris presents risks and potential hazards and may hinder the reconstruction of Ukraine if not managed properly. The risks posed by asbestos in debris will have a detrimental impact on public health in Ukraine. Acknowledging the country's drive towards a Green Recovery, aligned with the EU's Green Deal, a focus on ensuring the safe management and reuse of debris will be crucial to achieving circularity of materials in the recovery of Ukraine.

Asbestos-containing debris

With more than 70 per cent of buildings in Ukraine documented to have asbestos-containing construction materials, the presence of asbestos in the debris from war-damaged buildings is extensive. Asbestos poses a significant risk to human health, where even short-term exposure can lead to fatalities in decades to come. Safely managing asbestos-containing debris poses a considerable challenge to a country that has limited experience and capabilities in handling asbestos safely.

The need to define clear procedures and systems for managing and disposing of asbestos-containing debris will be a key requisite for Ukraine to recover.



Fig. 1. Asbestos-containing roofing sheets at war-damaged sites in Ukraine, hindering safe removal of debris and posing a human health risk to homeowners and the public.

Photo credit: Denys Pavlovskiy

02 Scale of impact of the war in Ukraine

The war in Ukraine, which began with the full-scale invasion by Russia on 24 February 2022, has caused extensive damage to various sectors, notably public infrastructure, housing and municipal systems. The war has led to both immediate and long-term challenges that require substantial reconstruction efforts. The total damage to Ukrainian infrastructure

was estimated at \$155 billion as of January 2024, highlighting the extensive impact on various essential services. (KSE 2024a). Additionally, the country's power, gas and heating infrastructure alone has suffered over \$10 billion in damage, leaving more than 12 million people with no or limited electricity and disrupting water and heating systems (UNDP 2023a).

Fig. 2. Infrastructure damage and destruction in Ukraine as of January 2024



Fig. 2. Infrastructure damage and destruction in Ukraine as of January 2024
 Source: KSE 2024b

2.1 Impact on public infrastructure

The war in Ukraine has inflicted severe damage on public infrastructure across the country, impacting daily life and the overall economy. The key areas of damage include (World Bank 2023):

- **Airports:** 9 of the country's 34 airports, have been destroyed, leading to a damage assessment of \$1.5 billion. The loss of these airports has significantly hindered both civilian and military air traffic, affecting logistics and emergency responses.
- **Roads:** the damage to road infrastructure is extensive, with 8,855 km of national roads, 8,625 km of local roads and 7,883 km of municipal roads affected.

The national roads alone have an estimated repair cost of \$9.4 billion, contributing to total damage to road infrastructure of approximately \$27 billion. The destruction of these roads has disrupted transportation and supply chains, making it difficult for goods and services to reach affected areas.

- **Railways:** significant damage has been reported in the railway sector, with at least 126 railway stations and their associated infrastructure damaged. The estimated cost of this damage is around \$4.3 billion. The destruction of railways has impeded the movement of people and goods, further straining the economy.

- **Bridges:** around 344 bridges and bridge crossings have been either destroyed or severely damaged, costing about \$2.6 billion. These bridges are crucial for connecting different regions and their destruction has isolated many communities.
- **Ports and inland waterway transport:** infrastructure related to ports, berths, warehouses and terminals has suffered damage of around \$0.85 billion. The damage to these facilities has disrupted trade and supply routes, which are essential for economic stability and growth.
- **Digital infrastructure:** the war has also impacted digital infrastructure, with damage to fixed-line and mobile operator infrastructure estimated at \$510 million. This damage has affected communication networks, hindering both civilian and military operations.
- **Residential buildings:** approximately 250,000 housing facilities have been either destroyed or damaged, including 222,600 private buildings, 27,000 multistorey buildings and 530 dormitories. In Volnovakha, for example, 90 per cent of the town has been destroyed, while in Kharkiv, over 1,292 residential buildings had been damaged or demolished as of March 2022 (Radio Free Europe/ Radio Liberty 2023; Infobae 2022).
- **Flooding from the Kakhovka dam explosion:** the explosion of the Kakhovka hydroelectric power station led to significant flooding, placing nearly 36,000 residential buildings at risk, primarily in the Kherson region. The estimated damage from this incident alone is \$1.03 billion.

Such impacts on public infrastructure may also affect men and women disproportionately, particularly due to the lack of gender analysis in disaster risk management and the frequent lack of prioritisation of women in disaster risk reduction (UN Office for Disaster Risk Reduction 2022).

2.2 Impact on the housing sector

The housing sector in Ukraine has faced catastrophic impacts due to the war. An estimated 1.4 million homes have been destroyed or damaged since the start of the war (World Bank 2023). This has resulted in a massive displacement crisis, with millions of people forced to flee their homes and seek refuge either within Ukraine or in neighbouring countries. The rebuilding of the housing sector is a top priority, with reconstruction costs expected to reach billions of dollars. The destruction has been quantified as follows:

- **Total area of damaged buildings:** the war has damaged or destroyed 88.9 million m² of housing, representing 8.6 per cent of the total housing stock in Ukraine.
- **Residential buildings:** approximately 250,000 housing facilities have been either destroyed or damaged, including 222,600 private buildings, 27,000 multistorey buildings and 530 dormitories. In Volnovakha, for example, 90 per cent of the town has been destroyed, while in Kharkiv, over 1,292 residential buildings had been damaged or demolished as of March 2022 (Radio Free Europe/ Radio Liberty 2023; Infobae 2022).

According to the Kyiv School of Economics, the regions with the most destroyed residential buildings include Donetsk, Kyiv, Luhansk, Kharkiv, Chernihiv and Kherson. The preliminary damage estimate for residential buildings is \$58.94 billion. The cost includes repairs, major reconstruction, new construction and the restoration of adjacent areas (UNDP 2023a).

In addition to longer-term house rebuilding needs, the Shelter Cluster in Ukraine¹ is coordinating humanitarian shelter and the non-food item response. Shelter and Non-Food Item cluster partners have reached approximately 5 million households with assistance since the full-scale Russian invasion of February 2022.

Damages to the housing sector also disproportionately affect women, who are often regularly managing households and providing care. This increased women's vulnerability places a greater burden in securing safe living condition, both physically and psychologically. Affected groups include female-headed households, grandmothers caring for orphans, battered women, women with disabling injuries, and newly widowed individuals (GFDRR 2018).

2.3 Impact on municipal infrastructure

Municipal infrastructure, including the water supply, sewage systems and electricity networks, has been heavily impacted by the war. Many regions, especially those close to the front lines, have seen their basic utilities disrupted. The joint report from the World Bank, United Nations, EU and the Government of Ukraine indicate that approximately 30 per cent of the country's water and sewage systems have been damaged (World Bank 2023). Electrical infrastructure has also suffered, with significant portions of the grid

¹ Global Shelter Cluster <https://sheltercluster.org/response/ukraine>

destroyed, leading to widespread power outages. Examples in several sectors are as follows:

- **Water supply and sewage:** significant damage has been reported in water and sewage pumping stations, with 73 water pumping stations and 120 sewage pumping stations damaged. The cost of this damage is estimated at around \$51 million for water and \$144 million for sewage. The disruption of these services has affected access to clean water and proper sanitation, posing health risks to the population.
- **Waste management:** Landfills and waste-sorting lines have faced substantial damage, with 21 landfills and 2 waste-sorting lines affected. Many landfills are overloaded or do not meet environmental safety standards (824 sites). Certification and reclamation efforts in 2021 were minimal, with only 48 out of 1,489 required certifications completed, and 29 out of 371 required remediation works carried out (Vox Ukraine 2022). The damage to waste-management infrastructure has led to uncollected garbage and improper waste disposal, which can result in environmental and public health issues.
- **Public transport:** the war has led to the destruction of 344 trolleybuses, 152 trams and over 13,812 buses. This has resulted in an estimated cost of \$3.13 billion for municipal transport. The loss of public transport has significantly impacted the mobility of citizens, making it difficult for people to commute to work, access health care and carry out daily activities.
- **Utility vehicles and infrastructure:** other damage has affected fire engines, rubbish trucks and other municipal utility vehicles, significantly impacting the functionality of municipal services. The loss of these vehicles has hindered emergency responses, waste collection and other critical municipal functions, further straining the resources of affected communities.
- **Public buildings, including schools and hospitals:** 3,800 educational institutions, 580 administrative buildings (state and local), 426 hospitals, 348 religious institutions, 48 social centres, 31 boarding schools, 31 shopping centres and other facilities have been damaged, destroyed or seized (KSE 2024b).
- **Private businesses:** 78 private businesses, as well as 348 state-owned enterprises, have been destroyed or damaged (KSE 2024b).

- **Agro-industrial complex:** at least 160,000 items of agricultural machinery have been damaged, destroyed or seized. The damage amounts to \$8.7 billion (KSE 2024b).

Adonis medical centre are located, killing at least seven people (Amnesty International 2024). The direct damage from the destruction of energy sector infrastructure due to the hostilities continues to grow to up to \$9 billion. Additionally, as of the beginning of 2024, direct damage in the areas of housing and public utilities totalled \$4.5 billion, while damage to health-care facilities increased to \$3.1 billion. By the beginning of 2024, damage to infrastructure had reached \$36.8 billion, with direct damage to industry and businesses having already reached \$13.1 billion (KSE 2024b).

03 Asbestos supply and use in Ukraine

Among the information gaps on the impact of the war in Ukraine, asbestos in debris from the impacts of damaged infrastructure is noted as a pressing challenge (World Bank 2023). This assessment report has therefore relied heavily on proxy information based on the history of asbestos use in Ukraine, domestic production, imports of asbestos and the latest estimates of debris generation.

3.1 Scale of production of asbestos-containing products

Asbestos-cement production covers approximately 35 per cent of the construction materials industry in Ukraine. Chrysotile asbestos has been used in various applications for decades. The asbestos-cement industry in Ukraine began to develop in 1929, when the first slate plant was launched in Kramatorsk, in the Donetsk region (Pohomii 2023). The Ukrainian State Concern to Produce Cement and Asbestos Cement Products (Ukrcement) (Ukraine, Cabinet of Ministers 1990) was established in 1990, combining 16 production enterprises and 2 industry research institutions (see production volume in table 1).

The largest portion of production in the asbestos-cement industry was asbestos-cement slate (flat and corrugated), asbestos-cement roofing façades, asbestos-cement pipes (water and wastewater), couplings and fittings for them, and similar materials. The main asbestos-cement products in Ukraine can thus be divided into roofing, façade and technological products.

Between 2006 and the first half of 2016, 556 thousand tons of chrysotile asbestos were imported into Ukraine. More than 85 per cent of imported chrysotile was used in the production of asbestos-cement products. Chrysotile asbestos was widely used as a fireproof, wear-resistant fibre filler in a wide range of products, such as slate, asbestos panels, water pipes, fireproof coatings, brake pads, gasket sealing rings (paronite) and electrical insulation. Asbestos was a component of textiles, plastics, papers, cardboard, threads and industrial mastics. A review of the statistics on the production of the main types of industrial products (State Statistics Service of Ukraine 2025) from 1990 to 2020 in post-Soviet Ukraine shows that there were no data separated by product type from the asbestos-cement industry from 1990 to 2022 (State Statistics Service of Ukraine 2025).

Table 1: Change in production of asbestos-containing materials in Ukraine, 1940–2000

Product	1940	1950	1960	1985	1990	1995	2000	Total
Slate (million standard plates)	42.4	87.7	338.3	1 360.7	1 462.9	530.9	584.3	4 407.2
Asbestos-cement pipes (km of standard pipes)	-	-	1 791	15 277	16 456	1 758.1	1 086	36 368.1

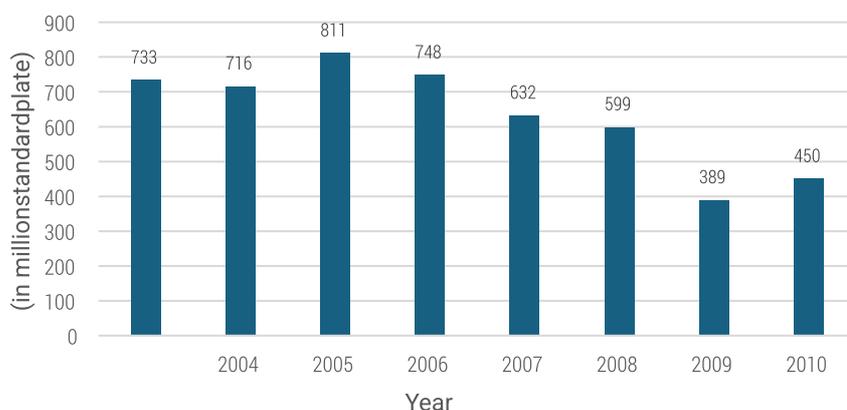
However, according to the Nomenclature of Construction Products², the production of asbestos-cement sheets (e.g. slate pipes, couplings and fittings made of asbestos-cement and similar materials) was statistically monitored in Ukraine. Based on the production volumes for asbestos-cement products statistics (see fig. 3) (State Statistics Service of Ukraine 2025), Ukraine produced a total of 5.078 million tons of corrugated slates, flat slates and similar asbestos-cement products between 2003 and 2010.

The requirements for providing statistical data from asbestos-cement businesses have changed since 2011. The data on asbestos-cement products, products with cellulose fibres or similar fibre mixtures (asbestos, cellulose and other natural fibres,

synthetic polymers, glass or metal fibres, etc.) and cement or other hydraulic binders containing asbestos have been monitored, and the units of measurement have changed from millions to thousands of tons of standard plates. The production of such products (see fig. 4)¹⁰ totalled 2,246 thousand tons of asbestos-cement products between 2011 and 2020.

Asbestos-cement production has reduced since 2011 due to many factors, but primarily: (a) the transition to asbestos-free slate; (b) the closure of a few relevant production facilities due to decreasing demand for products containing chrysotile asbestos; and (c) the government taking steps to protect workers from the risks associated with exposure to asbestos.

Fig. 3. Production volume of asbestos-cement products in 2003–2010, including corrugated slates, flat slates and similar products made of asbestos-cement.

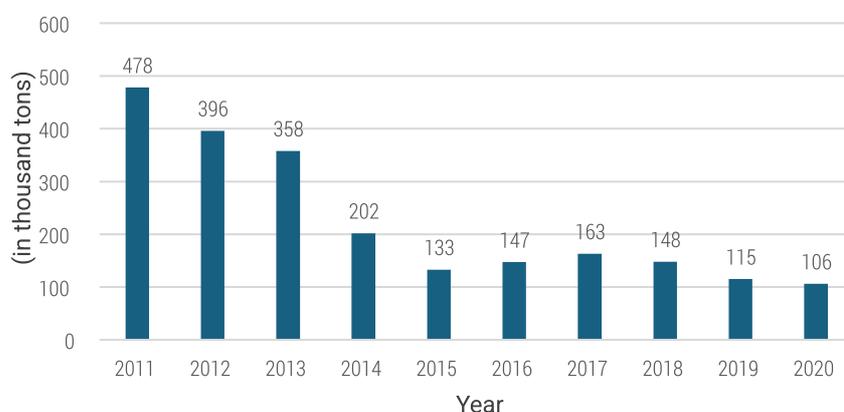


Source: State Statistics Service of Ukraine.

² Approved by Order of the State Statistics Service of Ukraine No. 321 (dated 30 August 2022), which further repealed the Order of the State Statistics Service of Ukraine No. 356 (dated 29 December 2017)

Fig. 4. Production of asbestos-cement products 2011–2020, including cement with cellulose fibres or similar fibre mixtures (asbestos, cellulose and other organic fibres, synthetic polymers, glass or metal fibres, etc.) and cement or other hydraulic binders containing asbestos

Note: Product name is according to the Nomenclature of Industrial Products (NIP). Starting in 2014, this value excludes the occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol and the temporarily occupied territories in the Donetsk and Luhansk regions



Furthermore, the production activity of the asbestos-cement industry has been decreasing since 2014 due to the economic problems in Ukraine after the annexation of the Autonomous Republic of Crimea and the military operation in the Donetsk and Luhansk regions of the country.

3.2 Imports of asbestos materials

Ukraine does not have its own domestic asbestos mines, so asbestos-containing materials such as chrysotile asbestos were continuously imported from Russia and Kazakhstan (MAMA-86 2008). According to the Ukrainian Ministry of Health, the country imported 556 thousand tons of chrysotile asbestos between 2006 and 2016: 64.5 per cent from Russia and 35.5 per cent from Kazakhstan. According to the State Statistics Service, imports of asbestos between 2014 and 2020 amounted to about 100,000 tons: 35 per cent from Russia and 65 per cent from Kazakhstan. More detailed information is provided in table 2.

The EU has progressively restricted and banned the use of asbestos and asbestos products. The European Commission adopted a Directive in 1999 (European Commission 1999) to ban the use of asbestos and asbestos products in the EU from 2005. Later (in 2009), another Directive was enacted to protect workers from exposure to asbestos at work (European Parliament 2009). Moreover, the European Parliament considered the report on asbestos-related occupational health threats and prospects for abolishing all existing asbestos in 2013 (European Parliament 2013) and adopted a decision to completely ban any use of asbestos by 2028, taking

measures to remove it safely from public buildings and facilities (Krówczyńska et al. 2016).

These actions by the European Commission have resulted in a significant decline in exports of manufactured products from Ukraine to the EU, and accordingly, in imports of asbestos to Ukraine. For comparison, Ukraine imported 108.83 thousand tons of asbestos in 2006 and later decreased to 81.23 thousand tons in 2007 mostly in the form of fibres, flakes and powder (UNDP 2023b, p.8). Imports in 2015 were only 10.3 thousand tons (see table 2).

Table 2: Volume of asbestos supplies to Ukraine, 2014–2020

Year	Russia		Kazakhstan		Total	
	Volume (thousand tons)	Cost (thousand USD)	Volume (thousand tons)	Cost (thousand USD)	Volume (thousand tons)	Cost (thousand USD)
2014	13.395	7742.5	11.347	7064.3	24.743	14806.9
2015	6.914	3419.5	3.442	1875.2	10.357	5294.7
2016	7.636	3376.3	7.903	3839.0	15.539	7215.3
2017	3.995	1738.6	11.985	5788.7	15.980	7527.2
2018	1.111	477.8	11.156	5545.7	12.268	6023.6
2019	1.298	559.9	9.035	4232.9	10.333	4792.8
2020	0.616	249.3	8.407	3978.0	9.024	4227.3
2021	0.703	322.2	3.312	984.0	4.015	1306.2
2022	0.002	3.6	-	-	0.002	3.6
					102.261	51,197.6

3.2.1 Application and use of asbestos-containing products

In terms of applications, the following are examples of chrysotile asbestos production and consumption, depending on the year of use:

- Asbestos for asbestos-cement production (corrugated slate, flat slate and pipes): 75 to 85 per cent of total consumption.
- Asbestos for asbestos-technical production (brake pads, linings, asbestos cardboard and asbestos cloth): 10 to 15 per cent of total consumption.
- Production of heat-insulating materials: less than 5 per cent of total consumption.

From 2003 to 2013, businesses in the asbestos-cement industry produced about 6,100 million standard plates, with one of the widest applications of asbestos in the country. The total volume of the domestic market for roofing materials ranged from 80 to 95 million m² annually. In terms of the general structure of roofing materials, the share of asbestos-cement slate varies between 70 and 75 per cent. At the same time, about 90-95 per cent of all slate is produced in Ukraine (UNDP 2023b).

In 2014, the total area of roofs covered with asbestos-cement slates in Ukraine was about 788.3 million m² (UNDP 2023b), comprising:

- **Residential buildings** – 587.7 million m²: asbestos-cement slate is used for roofing and protecting the walls of buildings and other structures.

- **Residential buildings** – 587.7 million m²: asbestos-cement slate is used for roofing and protecting the walls of buildings and other structures.

- **Public sector** – 40.9 million m²: according to the State Statistics Service of Ukraine, the area of premises of preschool educational institutions at the beginning of 2014 amounted to 4.32 million m² in rural areas. The area of rural general education institutions at the beginning of 2014 amounted to 22.57 million m² (total area – 26.9 million m²).

- **Agricultural production facilities** – 159.7 million m².

Today, out of 13 companies in Ukraine that worked with asbestos, only one remains, in Kramatorsk. Other owners have already sold or converted to safe alternative production of asbestos-free slate. Its production line is mostly unchanged, except for automation and the use of equipment in the blending department for adding fibres (asbestos substitutes) that are non-carcinogenic (e.g. polychloroalcohol fibres, cellulose, polyvinyl fibres and microsilica). In line with European experience, estimated costs for conversion are:

- Refitting of the existing asbestos line to an asbestos-free line (EUR 600,000 to 800,000; delivery of equipment and launch of the production line six to eight months).
- Production of a new line (EUR 1.5 to 2 million, delivery of equipment and launch of the production line 8 to 12 months).

At present, production lines for fibre-cement roofing sheets and fibre-cement slate components using PVA fibre, cellulose and cement have been installed and comply with European standard EN 494. While the market currently requires 6 million m² of slate, the production capacity of asbestos-free slate in Ukraine is about 9 million m².

Since the shape and colour of asbestos and non-asbestos slates are almost identical, consumers may have fewer problems with partial repairs of existing roofs, and companies do not need to research the non-asbestos slate market. Today, the cost of asbestos-free slate is 10 to 15 per cent higher than the cost of asbestos slate, but if the production of asbestos-free slate increases, its cost will likely decrease to the level of asbestos slate (UN Global Compact 2022).

3.3 Asbestos risk and hazards

Asbestos is a group of six silicate minerals that can form very fine fibres. They are split into the serpentine group (chrysotile) and the amphibole group (crysotile, amosite, anthophyllite, tremolite and actinolite). Chrysotile is characterized by a lower biological persistence in the lungs compared with amphiboles. Chrysotile, amosite and cryodolite have been widely used in industrial production (Ministry of Health of Ukraine, State Expert Centre of the Ministry of Health of Ukraine and Halytsky 2022).

All forms of asbestos are carcinogenic to humans. Asbestos is the main etiologic factor of malignant pleural mesothelioma. The Asbestos and Dust Diseases Research Institute (ADDRI) indicates that 30,870 mesothelioma cases were reported globally in 2020 and are estimated to rise to over 53,000 in 2040 (ADDRI no date). Worldwide, more than 230,000 people die annually from asbestos-related diseases (Arachi et al. 2021). Exposure to asbestos, including chrysotile, causes cancer of the lung, larynx and ovaries; mesothelioma, which is a rare form of cancer that affects the thin lining of the lungs, chest, abdomen and heart (Couespel and Price 2020); and asbestosis – a serious, progressive, long-term non-cancerous disease of the lung (United Nations 2018).

Recent study (Huang et al., 2023) using the Global Cancer Observatory database (2020), shows that the overall trend of mesothelioma was decreasing, which may be associated with asbestos use restrictions in several countries.

The declining trend of malignant mesothelioma among males is likely associated with occupational exposure, while the increasing trend among females may be attributed to environmental exposure (Huang 2023).

Asbestos exposure occurs when a person inhales fibres from polluted air in their working environment, as well as from ambient-air near sources of asbestos pollution or in rooms with fragile asbestos-containing materials. The highest level of exposure occurs in the process of repacking asbestos containers, mixing it with other raw materials and dry-cutting of asbestos-containing materials with abrasive tools. This can occur during the installation and use of asbestos-containing materials and the maintenance of automotive equipment.

Currently, about 125 million people in the world are exposed to asbestos in the workplace. Approximately half of the deaths from occupational cancer are estimated to be caused by asbestos. It has also been shown that co-exposure to tobacco smoke and asbestos fibres substantially increases the risk for lung cancer – and the heavier the smoking, the greater the risk (WHO 2024).

Mineral fibres are relatively stable and remain in the environment for a long time. They can be transported by air and water over long distances. At the same time, mineral fibres usually undergo certain chemical changes in the aquatic environment and in living organisms and are also capable of adsorbing various organic substances. Chrysotile and crocidolite asbestos have been proven to have the largest negative effect on lung and mesothelioma cancer development among all types of asbestos fibres. It was found that the maximum carcinogenic activity is exhibited by fibres with a length of more than 5 microns and a diameter of less than 1.5 microns.

The most negative effect on human health is caused by the presence of asbestos fibres in the air. Although these fibres make up only a relatively small fraction of the fibrous aerosols in the atmosphere, they are present almost everywhere. For example, according to the Agency for Toxic Substances and Disease Registry in the United States³, the concentration of asbestos fibres in the air in rural areas is 0.03–3 fibres per m³. In cities, the asbestos content rises to 3–300 fibres per m³, and near asbestos mining or processing firms, it can reach more than 2,000 fibres per m³. The use and grinding of recycled asbestos-containing debris, which is accompanied by dust emissions, can also be dangerous for people.

Fragile asbestos-containing materials are still found in many homes and remain sources of human exposure during operation, modification and removal or demolition. According to asbestos statistics from the World Health Organization (WHO),

³ Agency for Toxic Substances and Disease Registry, <http://www.atsdr.cdc.gov/>

several thousand deaths annually can be attributed to exposure to asbestos in the home (WHO 2024). The following asbestos-containing waste and materials present the greatest risks to public health due to their composition, and are found in several products, including:

- Asbestos-cement waste in lump form (corrugated and flat slates, and pipes)
- Asbestos-cement dust
- Asbestos dust and fibres
- Asbestos paper waste
- Asbestos textile waste
- Asbestos crumb waste
- Asbestos sludge not contaminated with hazardous substances
- Rubber asbestos waste (paronite, sleeves and gaskets)
- Other waste from businesses, institutions and organizations using and applying asbestos and asbestos-containing materials.

According to the National Cancer Registry of Ukraine, cases of malignant pleural mesothelioma and other malignant tumours were analysed among employees of 10 asbestos-cement firms located in eight regions of Ukraine. It was found that 72 people were diagnosed with malignant tumours during the 17-year period of epidemiological surveillance among workers in these firms. During the analysis of the risks of cancer morbidity among workers based on their exposure to asbestos, it was found that the ratio of chances of oncological pathology was highest among workers in raw materials stores, goods stores, dosing and preparation departments, and slate production. These workers also had higher than average cancer rates (UN Global Compact 2022).

The risks of oncological pathology were observed in different asbestos-cement production departments in various locations. The data showed that there were higher risks of malignant neoplasms of the digestive system among workers in raw materials and ready-to-use products stores; respiratory, digestive, skin and female genital organ malignancies in the dosing and preparation department; and respiratory, skin and female genital organ malignancies in slate production (UN Global Compact 2022).

These figures and data are fragmentary and incomplete. In reality, the statistics may be much worse. It is impossible to establish even an approximate number of specific cases, such as cancer, caused by asbestos exposure. The government pays significant costs for the treatment of occupational illness caused by exposure to asbestos dust, given that the average cost of treatment for one lung cancer

patient is UAH 150,000 (about \$10,000) (UN Global Compact 2022).

3.4 Regulatory framework for asbestos in Ukraine

3.4.1 Protection of workers

The application of asbestos by spraying and any working procedure with low-density (less than 1 g/cm³) insulation or soundproofing containing asbestos has been prohibited since 2009 (European Parliament 2009). Since the Law of Ukraine on the Public Health System came into force in October 2022, the sale and use of asbestos, any activities that may expose workers to it during asbestos extraction, manufacture and product processing, and products containing asbestos have been prohibited, except for treatment and disposal from demolition and asbestos removal works (Ukraine, Law on the Public Health System 2022).

The Law on the Public Health System also mandated planning for measures to prevent and eliminate harmful effects from environmental factors on the population. The production and use of asbestos, asbestos products and asbestos-containing materials are prohibited in construction and installation work. Safety measures and protection against the harmful effects of asbestos are determined by State Sanitary Regulations. The organization of traffic, design, location, construction and reconstruction of transport infrastructure facilities must comply with both State Sanitary and State Building Regulations.⁴

Any utilization of hazardous materials must have scientifically substantiated safety parameters, which must be established through State Sanitary Norms and, if necessary, State Sanitary Regulations. State Sanitary Norms and State Sanitary Regulations have been established to limit the intensity or duration of exposure to several factors by defining permissible criteria and safety parameters for human health.⁵

All operational areas that handle asbestos must be equipped with general supply and exhaust ventilation systems. Workers must be provided with personal protective equipment (PPE). All potential exposure routes that may affect the worker must be considered when choosing it. PPE is selected according to the worker's anthropometric information (e.g. posture, motion or movement range, strength, age and gender). PPE is cared for and maintained using washing and disinfecting agents that comply with the Safety and Health Requirement.15 Protective ointments, pastes and creams should be used to prevent skin irritation, along with waterproof gloves.

⁴ Law of Ukraine on the Public Health System, Article 28

⁵ Law of Ukraine on the Public Health System, Article 46

Medical examinations for workers handling asbestos and asbestos-containing materials should be conducted at least once every six months.¹⁶ Workers who present any early signs of disease caused by exposure to asbestos are prohibited from further involvement in asbestos-related activities.

3.4.2 Working environment

A risk assessment must be carried out for any activities or business entities that may expose workers to asbestos to determine the nature of the exposure, identify the mineral variety of asbestos and its fibre size, and workers' degree of exposure. In terms of air quality, for instance, the level of asbestos should not exceed 0.1 fibre per cm³ (average value) over an eight-hour period. Otherwise the work area cannot be accessed until protective measures for workers have been implemented or remedial action has been taken. Employers must also implement measures such as providing workers with PPE, displaying warning signs and preventing the spread of asbestos dust beyond the work area.

Work activities involving asbestos removal must be separated from residential areas by sanitary protection zones and must comply with the requirements of State Sanitary Norms and Regulations. The Sanitary Regulations require such activities to provide measures to reduce asbestos exposure, such as automation, remote operations, emergency shutdown of production equipment, etc. Equipment that contains asbestos dust in the work area must be sealed, connected to a ventilation system and equipped with air purification devices; otherwise, operating such equipment is prohibited.

The Sanitary Regulations require such activities to provide measures to reduce asbestos exposure, such as automation, remote operations, emergency shutdown of production equipment, etc. Equipment that contains asbestos dust in the work area must be sealed, connected to a ventilation system and equipped with air purification devices; otherwise, operating such equipment is prohibited.

State Medical and Sanitary Norms set permissible levels of chemical and biological substances in the ambient air in residential areas. Ambient air with asbestos content of up to 10 per cent of chrysotile asbestos is classified as Hazard Class 1. The maximum average daily allowable level of asbestos-containing dust (with a chrysotile asbestos content of up to 10 per cent) is 0.06 fibre per 1 ml of air.

The Ukrainian Ministry of Health has strengthened the State Sanitary Norms and Regulations on workers' safety and asbestos. The Regulations state that installed asbestos products in the work area may be used until removal is necessary. The exception is for low-density insulation (less than 1 g/cm³), which must be removed and replaced.

Ukraine has introduced legislative regulations to minimize asbestos use and reduce the negative impacts on human health. These regulations address working conditions and the working environment for activities that involve interacting with asbestos, asbestos-containing materials and dust-generating products. However, several normative legal acts have not yet been updated to comply with requirements of the more recent Law of Ukraine on the Public Health System, along with its mandated State Sanitary Norms and Regulations and the State Medical and Sanitary Norms (see section 4.1.). There are also several normative legal orders that stipulate the possibility of using asbestos in some sectors (see section 4.1).

3.4.3 Sanitary requirements for packaging, storage, transportation and handling operations

Asbestos, asbestos products and asbestos-containing materials that generate dust must be packaged in strong, hermetically sealed, dust-proof containers (e.g. synthetic bags or soft specialized containers). Containers made from plastic materials must be resistant to ultraviolet radiation. For transport purposes, packaging units (bags) containing asbestos must be safely secured using shrink film or another method and a dust-proof material (e.g. films, bags, covers, etc.). Asbestos must be packed for transportation. On land, it can be transported in covered railway wagons or motor vehicles or in water, in closed holds or containers.

Solid asbestos waste (e.g., bonded asbestos, asbestos cement, waste from seam ripping, broken brake pads, rubber remnants impregnated with bituminous mastic, etc.) for collection, storage, transportation or disposal must be stored in a secure place with no risk of destruction before removal. Bulk waste must be stored in impermeable bags or containers. Liquid asbestos-containing waste must be poured into special containers, tanks or sedimentation basins, which must be cleaned regularly. Overflowing and drying of sludge are not allowed.

3.4.4 Asbestos-containing debris

The Law of Ukraine on Waste Management defines hazardous waste as waste that possesses one or more hazardous properties⁶. The List of Hazardous Properties under Annex of the Law includes Carcinogenicity (HB7), which refers to waste that causes or increases the likelihood of cancer. In addition, the Procedure for Waste Classification classifies waste as hazardous if it meets one or more of the following conditions:⁷

- Contains hazardous chemical substances that exhibit hazardous properties listed in the List of Hazardous Properties (Annex) and the Procedure for Waste Classification (Annex).
- Contains hazardous chemical substances as defined in the Stockholm Convention on Persistent Organic Pollutants.
- Contains components⁸ where the concentration of hazardous substances exhibits the hazardous properties listed in Annex of the Law and Annex of the Procedure.

Asbestos dust and fibres are included in the List of Hazardous Components of Waste (Annex) under code C25. According to the National Waste List, all types of waste containing asbestos are classified as hazardous. Debris containing asbestos is also considered hazardous, and the management of asbestos-containing debris must therefore comply with the requirements for handling hazardous waste.

3.5 Management of asbestos and asbestos-containing materials and waste in Ukraine

The Law of Ukraine on the Public Health System provides, among other things, for a complete ban on the use and application of asbestos-containing materials in the construction sector in future. More steps need to be taken to complete the harmonization of national legislation with European legislation, such as developing regulations for managing asbestos-containing waste and materials. However, Ukrainian waste-management legislation is gradually being updated.

3.5.1 Classification of hazardous waste

The **Law of Ukraine on Waste Management** came into force in 2023, providing a new waste classification procedure. **The National Waste List and the Waste Classification Procedure** were approved by the Cabinet of Ministers of Ukraine on 20 October 2023 in Resolution No. 1102 (Ukraine, Cabinet of Ministers 2023c) to harmonize the waste classification procedure in line with the European List of Waste. Both the **National Waste List** and the **Waste Classification Procedure** must be utilized when classifying debris that may contain asbestos. Authorities should also consider applying the **List of Hazardous Properties** (Annex of the Law).⁹

Demolition waste from buildings and facilities may contain asbestos-containing materials waste, classifying it as hazardous waste. The List of Hazardous Properties includes asbestos (dust and fibres) under a corresponding of code (C25). According to the National Waste List, all waste containing asbestos is classified as hazardous and has a code for this purpose (see Table 6).

⁶ Paragraph 19, part 1, article 1

⁷ Paragraph 16 of the Procedure for Waste Classification, approved by the Cabinet of Ministers of Ukraine Resolution No. 1102 of 20 October 2023)

⁸ Listed in the Annex and taking into account Section II of Annex

⁹ <https://zakon.rada.gov.ua/laws/show/2320-20#n986>

Code	Name of group or subgroup and type of waste
06 07 01*	Wastes containing asbestos from electrolysis
06 13 04*	Wastes from asbestos processing
10 13 09*	Wastes from asbestos-cement manufacture containing asbestos
10 13 10	Wastes from asbestos-cement manufacture other than those mentioned in 10 13 09
15 01 11*	Metallic packaging containing a dangerous solid porous matrix (for example asbestos), including empty pressure containers
16 01 11*	Brake pads containing asbestos
16 02 12*	Discarded equipment containing free asbestos
16 12 27*	Insulation materials containing asbestos
16 12 30*	Building materials containing asbestos
17 06 01*	Insulation materials containing asbestos
17 06 05*	Construction materials containing asbestos
16 12 35*	Other demolition waste (including mixed waste) containing hazardous substances

Note: marked with * are categories identified as hazardous waste

Considering the significant scale of infrastructure damage, the Cabinet of Ministers of Ukraine has approved several regulations as follows:

- Procedure for carrying out urgent work to address the consequences of the armed aggression by the Russian Federation associated with damage to buildings and structures** (Ukraine, Cabinet of Ministers 2022e). This procedure defines a mechanism for the operational response by the executive bodies of village, town and city councils, military administrations, central executive authorities, governing bodies and civil defence forces. The goal of this procedure is to address the consequences of the military operations in relation to the destruction of buildings and structures in areas where there are no active hostilities or where they have ended. This procedure records the damage caused by the armed aggression of the Russian Federation to buildings and structures in private and municipal ownership. It may also record damage to buildings and structures in state ownership.
- Procedure for dismantling facilities damaged or destroyed as a result of emergency situations, military operations or terrorist acts** (Ukraine, Cabinet of Ministers 2022a). This procedure defines the mechanism for dismantling structures damaged or destroyed as a result of emergencies, military operations or terrorist acts. This mechanism is based on relevant decisions derived from the inspection results of the Procedure for Inspection of Commissioned Construction Objects.¹⁰ Furthermore, the procedure is implemented by the executive bodies to organize the dismantling of destroyed buildings, regardless of the type of consequences or ownership. The only exception is for defence and special-purpose facilities, cultural heritage facilities and facilities covered by the Law of Ukraine on the Use of Nuclear Energy and Radiation Safety (amended on 17 September 2023).
- Procedure for handling waste generated as a result of damage to (or destruction of) buildings and structures due to hostilities, terrorist acts, sabotage or work to eliminate their consequences (Ukraine, Law on Use of Nuclear Energy and Radiation Safety 2023)**. This procedure covers the waste-management

¹⁰

As approved by Resolution of the Cabinet of Ministers of Ukraine No. 257 (12 April 2017). Text available at <https://zakon.rada.gov.ua/laws/show/257-2017-n#n8>

mechanism for destroyed buildings and facilities, construction in progress, and landscaping as a result of military operations, terrorist acts, sabotage or work to address their consequences. It is intended to prevent and reduce the negative impact of such waste on the environment and human health. The procedure applies to rebuilding works to eliminate the consequences of armed aggression and hostilities during martial law and during the reconstruction period (within 90 calendar days after the termination or cancellation of martial law in Ukraine).

3.5.2 Obligations of producers, owners and legal entities in hazardous waste management

Asbestos-containing waste is considered hazardous waste. Producers and owners of hazardous waste, except for hazardous waste that forms part of household waste, are obliged to:

- Store hazardous waste separately from other types of waste.
- Ensure the collection, transportation and treatment of waste either independently – if they have a waste treatment operations permit and licence for hazardous waste management – or by cooperating with other businesses in the field of waste management.
- Prevent the transfer of hazardous waste to entities that do not have a waste treatment operations permit or a licence to carry out economic activities related to hazardous waste management.

This obligation does not apply to producers and owners of hazardous waste that form part of household waste.

Economic entities that handle hazardous waste are obliged to hold the relevant permit and licence, operate in accordance with legislative requirements and avoid contamination with other types of household waste. Local government and organizations implementing Extended Producer Responsibility (EPR) must also provide separate containers for hazardous waste.

¹¹ Article 29, Law of Ukraine on Waste Management

¹² Article 28, Law of Ukraine on Waste Management

¹³ Article 41, Law of Ukraine on Waste Management

¹⁴ Paragraph 40 of the Annex to the Law of Ukraine on Waste Management

¹⁵ Paragraph 75 of the Annex to the Law of Ukraine on Waste Management

¹⁶ Points 2–7, Article 43, Law of Ukraine on Waste Management

3.5.3 Labelling, transport and mixing of hazardous waste

The labelling of hazardous waste collected as part of household waste is carried out by a firm operating in the field of waste management after collection. If an entity providing solid waste services does not have a licence for managing hazardous waste after collection, separation and proper labelling, it must transfer the waste to another entity with a licence. Producers and owners of hazardous waste are prohibited from mixing different types of hazardous waste or hazardous waste with non-hazardous waste.¹¹

Hazardous waste must be collected separately and must not be mixed with other waste. If hazardous waste has been mixed with other types of hazardous waste or substances or other waste, the entity must separate the mixed waste if this is technically feasible. As conditions for separate waste collection are currently being established in Ukraine, the law explicitly allows for the presence of hazardous waste within household waste. This hazardous waste is to be removed only at the waste recovery stage.

Hazardous waste must be packaged, labelled and have the necessary supporting documents during its collection and transportation.¹² Transportation and labelling of hazardous waste must comply with the Law of Ukraine on the Transportation of Dangerous Cargo and other legislative acts on the transportation of dangerous cargo.¹³

3.5.4 Permitting and licensing

Economic entities are required to obtain a permit for waste treatment operations before commencing their activities. The Law of Ukraine on Waste Management defines three types of permit (also duplicated in the Law of Ukraine on the List of Permits in the Field of Economic Activity):

- Permit for waste treatment operations)¹⁴ (Ukraine, Cabinet of Ministers 2023d)
- Written consent notification for transboundary (international) transportation of hazardous waste^{15, 16, 17}
- Conclusion on transboundary waste transportation,^{18, 19} which approves the request for hazardous waste transport.

¹⁷ Regulation on Control over Transboundary Transportation of Hazardous Waste and its Utilization/Disposal, approved by the Resolution of the Cabinet of Ministers of Ukraine No. 1120 (dated 13 July 2000). Text available at <https://zakon.rada.gov.ua/laws/show/1120-2000-%D0%BF#Text>

¹⁸ Paragraph 158 of the Annex to the Law of Ukraine on Waste Management

¹⁹ Points 9–12, Article 43 of the Law of Ukraine on Waste Management

The Law of Ukraine on Waste Management defines two types of licence, (also duplicated in Article 7(1) of the Law of Ukraine on the Licensing of Economic Activities). Relevant economic activities that are subject to licensing are as follows:

- 14-1) Hazardous waste-management activities (defined by the Law of Ukraine on Waste Management)
- 24) Transportation of passengers, dangerous cargo and hazardous waste by inland water, sea, road, rail and air transport, and international transportation of passengers and cargo by road.

Obtaining a licence to carry out hazardous waste-management activities is required only in cases specified by the Law of Ukraine on Waste Management.

At the same time, hazardous waste-management activities are carried out by economic entities based on a licence²⁰ issued according to the procedure established by the Law of Ukraine on the Licensing of Economic Activities, considering the specifics determined by this Law, which include:

- A set of operations for the collection and treatment of hazardous waste
- Collection and storage of hazardous waste for their further export for treatment or disposal.

For exports, obtaining a licence exclusively for waste collection or waste storage operations is possible, provided that there is a notarized agreement between the exporter (i.e. this applies only to waste exports) and the person responsible for waste treatment.

However, there is no need to obtain a licence to carry out hazardous waste-management operations for the following:

- Activities involving the acceptance and storage of waste, provided that within one year, the waste accepted or produced is transferred to an economic entity holding a licence to conduct hazardous waste-management operations, subject to the submission of reporting information (declaration) by the economic entity to the waste-management information system (in effect, any entity can accept and store waste without necessarily having information about hazardous waste, and anything can happen to the waste within one year).
- Activities related to the collection of hazardous waste as part of household waste following the procedure established by law.
- Activities by emergency rescue units related to responding to emergencies and their consequences

²⁰ Article 44 of the Law of Ukraine on Waste Management

²¹ Paragraph 4, Section XI of the Law of Ukraine on Waste Management

Licensing terms do not apply to the licensing of hazardous waste transportation activities. There are separate licensing conditions for transporting hazardous waste by road (Ukraine, Cabinet of Ministers 2023e), inland water or sea (Ukraine, Cabinet of Ministers 2015a), rail (Ukraine, Cabinet of Ministers 2015b) and air (Ukraine, Cabinet of Ministers 2017).

The Law of Ukraine on Waste Management stipulates that entities that collect and treat hazardous waste are required to obtain a licence to operate within six months of the date of entry into force:²¹

- Within six months after the entry into force of the aforementioned Law (i.e. by 9 January 2024) for installations with a capacity of 100 tons or more per day
- Within one year after the entry into force of the Law (i.e. by 9 July 2024) for installations with a capacity of less than 100 tons per day.

During martial law, the right to conduct economic activity may be acquired by economic entities based on a free submission to the licensing authorities without obtaining permits (authorization documents, licences or other results of the provision of public services). They may submit a declaration on the economic activity conducted (hereinafter referred to as the 'declaration') to authorizing authorities and entities providing public (and electronic public) services.²² An exemption applies to several economic activities listed in Annex .

There are, however, exceptions for economic activities that are not exempt (as listed below) and they therefore require a licence or similar as stipulated:²³

- Hazardous waste management (licence)
- Cross-border transportation of hazardous waste (written consent –notification)
- Transportation of dangerous cargo and hazardous waste by road and rail transport (licence and other permits)
- Waste treatment operations (permit).

Accordingly, during a period of martial law, it is not possible to carry out the hazardous waste-management operations listed above without obtaining a licence. However, given the absence of hazardous waste transportation by inland water, sea and air, it can be assumed that such types of transportation may be carried out based on a declaration.

²² Paragraph 1, Resolution of the Cabinet of Ministers of Ukraine No. 314 (dated 18 March 2022)

²³ Annex to Resolution of the Cabinet of Ministers of Ukraine No. 314 (dated 18 March 2022).

Declarations submitted before 9 January 2024 are valid for five months from the date of entry into force of the relevant amendments. Therefore, such entities were able to carry out waste treatment operations until 9 June 2024 based on the declarations submitted (Ukraine, Cabinet of Ministers 2023a). The date was later extended to 9 October 2024 (Ukraine, Cabinet of Ministers 2024). Since then, economic entities have been obliged to carry out waste treatment activities exclusively based on the relevant permit.

As of 23 July 2024, **the Registry of Permits for Waste Treatment Operations** listed only 56 legal entities, two of which perform disposal at specially equipped landfills (including disposal in separate sections that are closed and isolated from each other and from the environment). However, they perform this operation only for household waste, bulky waste, street cleaning, market waste and plant tissue (without the possibility of hazardous waste disposal).

The register of declarations on the conduct of economic activities related to waste treatment operations is not currently publicly available and we are therefore unable to establish the presence of legal entities that have permits for the treatment of asbestos-containing waste.

As of 23 July 2024, **the Registry of Hazardous Waste Management Licensees** listed only 25 legal entities, of which only one is authorized to manage asbestos (dust and fibres) waste. This means that currently only one legal entity in the whole of Ukraine may be entitled to manage asbestos-containing waste as of the above date. As of November 2024, the Register of Hazardous Waste Management Licensees had 34 companies with new licences since the Law of Ukraine on Waste Management came into force. However, there are no new legal entities for the treatment and management of asbestos waste.

3.5.6 Other documents required for hazardous waste management

Waste declaration

Owners of non-hazardous waste whose annual volume of waste generation exceeds 50 tons must submit an annual waste declaration.²⁴ 'Waste owners' include a natural or legal person who generates waste or who, in accordance with the law, owns, uses and disposes of waste.

²⁴ Part 1, Article 45, Law of Ukraine on Waste Management

²⁵ Clause 12, Part 1, Article 1, Law of Ukraine on Waste Management

²⁶ Clause 41, Part 1, Article 1, Law of Ukraine on Waste Management

²⁷ Clause 2 of the Procedure for Submitting a Waste Declaration, approved by the Resolution of the Cabinet of Ministers of Ukraine No. 556 (dated 7 May 2022) on Certain Issues of Submitting a Waste Declaration

'Waste producers' must also submit a waste declaration if their activities result in the generation of hazardous waste or if their annual volume of non-hazardous waste exceeds 50 tons.²⁵ Waste producers include waste-management entities that carry out sorting, mixing or other operations that change the characteristics or composition of the waste.²⁶

As a result, both waste producers and waste owners are required to submit a waste declaration, especially those whose activities result in the generation of hazardous waste or who are owners of non-hazardous waste whose annual volume exceeds 50 tons.²⁷ The annual declaration must be submitted by 20 February of each year (following the reporting year) in electronic form through the Open Data Portal²⁸

If the activities of a waste producer or owner result in the generation of hazardous waste, notifying the state authorities of this circumstance may be delayed by a significant period, during which such waste could pose a threat to human life and health, irrespective of the quantity of such waste.

Environmental Impact Assessment

Owners of non-hazardous waste whose annual volume of waste generation exceeds 50 tons must submit an annual waste declaration. 'Waste owners' include a natural or legal person who generates waste or who, in accordance with the law, owns, uses and disposes of waste.

An Environmental Impact Assessment document is mandatory for the decision-making process on activities subject to the Law of Ukraine on Environmental Impact Assessment. Activities that are not listed, as well as those focused exclusively on national defence, emergency response and a change of designation of particularly valuable land restoration work resulting from the impact of armed aggression during a period of martial law, are not subject to an Environmental Impact Assessment. This also includes all activities defined by Procedure No. 1073.

However, based on the Law of Ukraine on Environmental Impact Assessment, economic activities related to both hazardous and non-hazardous waste treatment facilities with a capacity of 100 tons or more per day are subject to an Environmental Impact Assessment.²⁹

²⁸ Clause 4 of the Procedure for Submitting a Waste Declaration

²⁹ Paragraph 8, Part 2, Article 3, Law of Ukraine on Environmental Impact Assessment

3.5.7 Transportation of hazardous waste

The Class 9 Dangerous Cargo classification³⁰ includes substances (including mixtures and solutions), materials and articles that pose a danger during transportation that is not typical of other classes. Category 1 of Class 9 includes substances (including mixtures of substances) whose fine dust may pose a health hazard when inhaled, particularly asbestos and mixtures containing asbestos.

The transportation of hazardous waste is regulated under the Law of Ukraine on the Transportation of Dangerous Cargo. This law regulates each entity's rights and obligations in Section II, lists the authorities and roles of state management and safety regulation bodies in Section III and sets out transport requirements – such as vehicle requirements and conditions, transport documents, liability, insurance and working conditions – in Section IV.

Lists of regulations related to the transport of hazardous waste are available in Annex .

3.5.8 Disposal and treatment of hazardous waste

Treatment usually consists in the use of thermal and chemical methods to neutralize asbestos-containing materials (ACM) waste, which is a relatively expensive solution. This is why the most common way to manage ACM waste in the world is to dispose of it in landfills (according to various estimates, this method is used for more than 90 per cent of all global ACM waste generation). There are no suitable facilities in Ukraine that can treat ACM waste. Therefore, disposal of ACM waste to landfills remains the main method of asbestos management in Ukraine.

Each region in Ukraine maintains **the Register of Waste Disposal Sites**, which is a system of data obtained via accounting records and descriptions of all facilities and specially designated places where waste disposal operations are carried out. The rules for keeping the register are determined by the Procedure for Keeping Registers of Waste Disposal Sites (as amended on 30 October 2013), approved by the Resolution of the Cabinet of Ministers of Ukraine No. 1216 dated 3 August 1998. The registers are maintained by local state administrations. Currently, the data from each oblast is available on the Open Data Portal (Ministry of Digital Transformation 2024).

Analysing the Registers of Waste Disposal Sites allows us to identify appropriate landfills for the disposal of hazardous ACM waste and asbestos-containing construction and demolition waste in almost every region of Ukraine.

Since ACM waste in Ukraine is classified as hazardous waste according to the National Waste List, it can be disposed of at hazardous waste landfills. Currently in Ukraine, asbestos-containing waste is supposed to be disposed of at landfills together with municipal solid waste and covered with a layer of soil to avoid the spraying of small particles. However, European practices require separate disposal procedures for asbestos-containing waste, ideally within separate landfills or specially designated areas at landfills, and asbestos-containing waste should only be transported in packaged form.

An exception to the rules for the management of hazardous ACM waste is 2003/33/EC: Council Decision of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex to Directive 1999/31/EC of 26 April 1999 on the landfill of waste in respect of construction waste containing asbestos.

This Council Decision allows for the disposal of construction and building waste containing asbestos to non-hazardous landfills under certain conditions, which are set out below.

From an engineering point of view, a landfill for household waste, like a landfill for nonhazardous waste, must be equipped to certain standards (Annex : General requirements for all classes of landfill to Directive 1999/31/EC on the landfill of waste of 26 April 1999) (European Council 1999):

- A lower filtration screen with a filtration coefficient of $1.0 \cdot 10^{-9}$ m/s, which may consist of:
 - a layer of uncompacted clay with a height of 1 m
 - a layer of compacted clay with a height of 0.5 m and a geomembrane with a thickness of at least 2.5 mm and a filtration coefficient of $1.0 \cdot 10^{-9}$ m/s
 - a layer of bentonite mats with a density of at least 3600 g/m² and a geomembrane with a thickness of at least 2.5 mm and a filtration coefficient of $1.0 \cdot 10^{-9}$ m/s.
- A leachate extraction and disposal system.
- An environmental impact monitoring system.

Landfills for non-hazardous waste must be engineering facilities which, according to current Ukrainian legislation, must also satisfy the requirements similar to those of SCN B.2.4-2-2005 'Landfills for solid household waste. Basic design provisions', which were

³⁰

According to DSTU 4500-3:2008 Dangerous Cargo, Paragraph 6.13.3

approved by the Order of the State Construction Committee of Ukraine No. 101 dated 17 June 2005. This has been in force since 1 January 2006, with changes implemented in 2020.

Box 1

Disposal process for asbestos-containing debris and materials

- Prior to disposal, approval must be obtained from the owner of the landfill.
- Asbestos waste must be in a separate area or a dedicated trench for immediate burial.
- The disposal site must have all-weather access to the separate area or the dedicated trench for asbestos disposal.
- The haulier must ensure that equipment for burying asbestos is available before any asbestos waste is hauled to the landfill.
- Asbestos waste must not be stockpiled at the landfill for burial at a later date.
- Caution should be exercised to ensure that bags or containers are not damaged before they are covered. If an asbestos container is ruptured, it should be re-packed by trained personnel prior to burial.
- An initial layer of cover material or fill must be placed over the asbestos waste before heavy equipment passes over the asbestos waste.
- A minimum of two metres of compacted fill is required by the end of the working day. If asbestos waste is deposited in the active area, up to 50 per cent of the fill may consist of solid waste.
- Asbestos waste must not be handled in windy conditions.
- Detailed location information and maps must be recorded and maintained to minimize the risk of exposing asbestos waste during future activities at the landfill.
- An asbestos emergency response plan should be considered.

Debris disposal and its challenges

Landfills for household waste in Ukraine must comply with the requirements of SCN B.2.4-2-2005 in accordance with current legislation. Landfills for non-hazardous waste comply de facto with the requirements of SCN B.2.4-2-2005 for household waste landfills but at the same time, de jure, are not covered relevant legislative and normative acts.

Therefore, between October and November 2022, the Ministry of Environmental Protection and Natural Resources tasked the Ministry for Communities and Territories Development to develop appropriate regulations for non-hazardous landfills. This work began in December 2022 but was put on hold in January 2023 due to the reorganization of the Ministry and the delay in allocating funding.

Work on this subject has not yet resumed and unfortunately, the situation remains unchanged. In practice, a landfill built in accordance with SCN B.2.4-2-2005 can accept construction waste containing asbestos in accordance with the Technical Operating Rules, but there are no formal justifications for this possibility with reference to the state construction standards that define the requirements for landfills for non-hazardous waste.

This means that there is currently no way to determine landfill classification and confirm whether a site is designed only for household waste or can include non-hazardous waste. Therefore, the acceptance of the asbestos-containing debris remains the responsibility

of operators on a case-by-case basis.

dispose of debris and demolition waste containing asbestos at non-hazardous waste landfills since the end of 2022. However, the Ministry for Communities and Territories Development has not yet developed state construction standards for hazardous waste landfills. This creates confusion in the disposal of debris and demolition waste containing asbestos between waste producers and recipients. In addition, the existing infrastructure for the disposal of asbestos-containing debris and demolition waste in Ukraine is limited, due to the lack of relevant regulations (building codes) and the economic unattractiveness.

The management of asbestos-containing waste as part of demolition waste requires a special approach and the implementation of best practices, such as screening and risk assessment, laboratory analysis and asbestos management plans, remediation and verification, transportation and disposal. It is also important for the authorities to implement a system to measure and interpret data, develop risk assessment methodologies, determine the specification of the equipment to be used in handling such waste and develop control and monitoring mechanisms.

The Ministry of Environmental Protection and Natural Resources, together with international and national experts, is developing rules for managing asbestos-containing waste and asbestos-containing debris. A map of such wastes is being developed, as well as ,

plans for their management, rules for verification transportation and disposal, and mechanisms for control and monitoring by the authorities.

In turn, to ensure safe and effective operation of landfills, the Ministry of Environmental Protection and Natural Resources has developed a set of Technical Operating Rules for Landfills, Termination of Operation, Recultivation and Management of Landfills after Termination of Operation (Ministry of Environmental Protection and Natural Resources of Ukraine 2024). According to these Rules, non-hazardous waste landfills are allowed to accept waste containing bonded asbestos or asbestos fibres bonded with binders or packaged in plastic, provided this waste does not contain any hazardous substances other than asbestos. Storage of waste containing asbestos should be covered with a layer of insulating materials within a day, regardless of the outside temperature. In addition, it is forbidden to carry out work on such a site that could lead to the emission of asbestos fibre.

To operate a landfill for non-hazardous waste, technological plans for the organization of waste disposal activities must be developed and stored throughout its life cycle, for example working maps and disposal sites for stabilized and nonreactive hazardous waste, including asbestos disposal sites. In non-hazardous waste landfill, packaged waste containing asbestos can be disposed together with other waste in the same working unit, specifically in its most isolated area.

Based on these Rules, UNDP and the Ministry of Environmental Protection and Natural Resources have analysed potential sites for the disposal of ACM waste at existing landfills that could be used for the above purposes. The list of potential sites for the disposal of ACM waste is presented in Table 7 and requires a detailed analysis, visual inspection and development of a remediation project in accordance with the requirements of the current legislation.

Table4: Potential landfill sites for asbestos-containing waste

Registration No. and date	#14 14 September 2004	#553 25 May 2022	#12 30 July 2004
Name of WDS	Nizhyn City, Solid Waste Landfill D1	The Slavutyich city solid waste landfill D5	Solid waste landfill D5
Location	Chernihiv oblast, Nizhyn city (0.8 km from residential area), 7423300000 (UA74040250010023991)	8 km west of Slavutyich, Chernihiv district, Nedanchychi village, UA32100130000093505, latitude 51.50911, longitude 30.67431	Novobilouska village council, Chernihiv district, Chernihiv oblast (0.7 km south of Chernihiv city), 7410136600
Full name and address	Chernihiv oblast, Nizhyn city (0.8 km from residential area), 7423300000 (UA74040250010023991)	Slavutyich City Council, 07101, Kyiv region, Vyshhorod district, Slavutyich, Central Square, 7 (32631821)	Department of Housing and Communal Services of Chernihiv City Council, 19, Remysnychna Street, Chernihiv, Ukraine (03366374)
Groundwater protection	Protected	Protected	Protected
Extraction and disposal of biogas and filtrate	Biogas plants are absent; presence of filtration processes; constant drainage run-off	Biogas plants are absent; presence of filtration processes; constant drainage run-off	Presence of filtration processes; constant drainage run-off
Air emission control	Monitoring is carried out	Monitoring is carried out	Monitoring is carried out
Soil and groundwater contamination	Groundwater and surface water monitoring; soil monitoring	Monitoring of groundwater and surface water; soil quality	Monitoring of groundwater and surface water; soil quality
Operation mode (active/closed)	Active	Active	Active, exceeding the design capacity

Note: This list was prepared in communication with the Ukrainian Ministry of Environmental Protection and Natural Resources in August 2024

3.5.9 Management of demolition waste

The Law of Ukraine on Waste Management requires entities engaging in the construction or demolition of engineering structures to collect construction and demolition waste separately, maintain its accounting records and transfer the waste to other authorized waste-management entities for treatment. Non-hazardous waste from the construction and demolition sector should be prepared for reuse, recycling or other material recovery, including back-filling.

As noted, separated waste collection is a key component of waste-management operations. Thus, any economic entities involved in the construction or demolition of buildings and engineering structures – even if they are not classified as waste-management entities – are obligated to manage waste, including hazardous waste, even without holding specific permits and licences.

3.5.10 Management of demolition waste during martial law

Under martial law in Ukraine, Resolution No. 474 was adopted to address the procedure for dismantling damaged facilities (Ukraine, Cabinet of Ministers 2022a). Similarly, Resolution No. 1073 addresses the handling of generated waste and debris from damaged facilities (Ukraine, Cabinet of Ministers 2022b).

Demolition

Resolution No. 474 (para. 9) specifies that dismantling activities must be halted if risks to human and public health arise at the site or adjacent area. Measures must then be taken to eliminate hazardous production factors. Furthermore, procedure 474 (para. 16) requires the dismantling plan to include safety measures to keep hazardous substances within safe limits.

Procedure 474 permits the reuse of insulation materials containing asbestos in construction and building materials industries. It also allows asbestos-containing construction materials (products) to be reused as secondary raw materials for producing polymeric products (e.g. glass, ceramics as fillers or concrete production, at outlined in appendix 1). However, these provisions are contradictory to the provisions of the Law of Ukraine on the Public Health System.

Paragraph 12 of Resolution No. 1073 states that if hazardous waste is identified during dismantling or at destroyed sites, the management of such waste must comply with section IV of the Law of Ukraine on

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Paragraph 12 of Resolution No. 1073 states that if hazardous waste is identified during dismantling or at destroyed sites, the management of such waste must comply with section IV of the Law of Ukraine on Waste Management. Demolition waste management involves operational and technical measures to ensure environmentally safe collection, transportation, recovery and disposal of such waste. Demolition waste management does not require a permit for waste processing under the Law of Ukraine on Waste Management (Ukraine, Cabinet of Ministers 2022b, para. 4). However, the repeal of certain provisions has left it unclear whether a new permit is now required. Changes in Resolution No. 1073 only shifted authority from the Ministry for Communities and Territories Development to the Ministry of Infrastructure.³¹

The management of demolition waste begins its identification and accounting, which is organized by the authorized body (i.e. the executive body of the village, town, city council or military administration of the settlement, if established in accordance with the law) (Ukraine, Cabinet of Ministers 2022b, para. 6). The authorized body conducts this activity based on the following factors:

- Inspections of damaged or destroyed objects
- Consideration of applications (reports) from citizens, businesses, institutions, organizations and other legal entities

³¹

Resolution No. 1073 also provides amendments to one of the resolutions regarding the accounting procedure for receiving waste from generators or owners. However, these amendments will be invalidated upon the approval of Resolution No. 1279 (Ukraine, Cabinet of Ministers 2023f).

- Reports regarding the discovery of demolition waste

Clause 7 of Procedure 1073 (para. 7) specifies that demolition waste must be accounted for at the location where it is generated, at temporary storage sites or at waste processing facilities. This includes accounting for insulation and construction materials containing asbestos (appendix 1 and 2).

Box 2

Operations for managing debris from destroyed infrastructure

Operations for managing waste from destroyed infrastructure include the following:

1. Initial clearing of territories, including debris collection and, where possible, sorting of individual debris components³²
2. Transportation of waste from the site of generation to waste management facilities (now referred to as waste treatment facilities under the new law) or temporary storage sites
3. Final clearing and cleaning of territories after dismantling damaged or destroyed objects, if necessary
4. Storage of waste at temporary storage sites or waste processing facilities until their recovery or disposal
5. Preparation of waste for reuse or disposal
6. Recovery of waste through reuse as secondary materials or energy resources
7. Removal of waste, including its disposal

If the owner or manager of a facility intends to carry out the clean-up of the territory independently – including waste collection, sorting and transportation – the work may begin after receiving confirmation from the authorized body that urgent work has been completed. This information is provided at the request of the owner or manager (Ukraine, Cabinet of Ministers 2022b, para. 22).

At the same time, paragraph 7 of the Procedure for Providing Compensation for Destroyed Real Estate³³ stipulates that by applying for compensation (for construction products purchased or to carry out construction work), the recipient should take measures to minimize the negative impacts of construction activities. The following measures should be implemented:

- Ensuring proper waste management and handling by using appropriate personal respiratory protection equipment and protective clothing, as well as moistening the area
- Preventing further destruction of asbestos-containing waste, where possible

- Minimizing the spread of asbestos-containing dust by performing wet cleaning (spraying) in areas where ACM are handled
- Collecting and packaging asbestos-containing waste in durable, airtight, dust-proof containers to prevent contact with the environment and to facilitate its transportation to treatment facilities
- Ensuring the asbestos-containing waste is transferred to licensed waste-management entities authorized to perform such activities

The dismantling process must be carried out following Resolution No. 474, taking into account the following features:

- Before starting the dismantling work (where there is no immediate threat of emergency structural collapse), contractors must remove and separate components containing hazardous waste, including asbestos-containing waste.
- During dismantling, measures should be taken to minimize risks to human health and the environment,

³² According to the new law, sorting is a waste management operation, and this bullet point is referring to physical distribution.

³³ This was approved by Resolution No. 600 of the Cabinet of Ministers of Ukraine (Ukraine, Cabinet of Ministers 2023b).

including reducing exposure to asbestos dust.³⁴

- During demolition work, waste from destruction should be sorted, where possible, to facilitate further processing (Ukraine, Cabinet of Ministers 2022b, para. 24).

Temporary storage

Under martial law in Ukraine and within 90 days after its termination, if the volume of waste from destroyed objects exceeds the capacity of waste-management facilities in a given territory (or such facilities are unavailable), the Kyiv Military (Kyiv City) and Regional Military (State) authorities may decide on the establishment of temporary storage sites (Ukraine, Cabinet of Ministers 2022b, para. 25).³⁵

Temporary storage sites must comply with environmental and fire safety requirements, ensure environmental protection, promote the rational use and restoration of natural resources, and adhere to the necessary sanitary protection zone requirements:

- At least 0.5 kilometres from residential and public buildings or social infrastructure facilities
- At least 0.2 kilometres from agricultural lands, public roads and railway networks
- At least 0.05 kilometres from forests

The establishment of temporary storage sites on water-fund lands or within water protection zones is prohibited (Ukraine, Cabinet of Ministers 2022b, para. 26).

In addition, the temporary storage sites must be established in compliance with the following requirements (Ukraine, Cabinet of Ministers 2022b, para. 27):

- A solid and level base (coating) made of concrete, asphalt or compacted soil
- Organized drainage of water generated by precipitation (if necessary)
- Fenced perimeter (if necessary)
- Adequate lighting for the territory (if necessary)
- Equipped entrances and access roads to ensure unimpeded vehicle passage

In addition, the temporary storage sites must be established in compliance with the following requirements (Ukraine, In temporary storage sites, it is permissible to only process the main components of waste from destroyed objects. Examples of these are parts of building structures, door and window blocks, engineering networks and sanitary appliances, etc.

However, these should not contain or be contaminated with hazardous waste (Ukraine, Cabinet of Ministers 2022b, para. 28). The treatment and processing of such main components include separation, crushing and fractionation.

Appendix 1 of Procedure 1073 also addresses options for different types of materials, including insulation and construction materials containing asbestos. It provides requirements for the process of collection, packaging and transfer for disposal. The collection process must be carried out using personal respiratory protection equipment and protective clothing, and ensuring the humidification of the collection area. The process should prevent further destruction of asbestos-containing debris. The collected asbestos-containing debris should be packaged to prevent contact with the environment and transported to the disposal site. After storage at the disposal site, it shall be covered with an insulating layer (soil, clay, crushed construction waste, etc.) with a thickness of at least 75 centimetres.

Under martial law, Ukrainian legislation provides for relaxation in the field of hazardous waste management due to the impossibility of following all the requirements in normal circumstances. This should be complemented by a mid-to-longer transition plan to avoid future negative impacts.

³⁴ The list of measures is currently addressed by the Law of Ukraine on Ensuring Sanitary and Epidemic Safety of the Population and in Resolution No. 1073.

³⁵ This follows the Law of Ukraine on the Legal Regime of Martial Law.

04 Gaps and risk elements of debris and asbestos-containing debris management

4.1 Gap assessment on regulatory framework

A summary of the gap assessment is drawn in table 5.

Table 5: Gap assessment on regulatory frameworks for managing asbestos-containing debris in Ukraine

Existing condition	Legislation	Highlights
Related to the management of asbestos and asbestos-containing debris		
Asbestos (regardless of its type), asbestos-containing products and materials used in technological processes and during construction and installation work on any objects are prohibited.	Law of Ukraine on the Public Health System (part 3, article 28)	If the legislator intended to impose a total ban on asbestos use, the prohibition should be extended to other areas (rather than be limited to technological processes or construction and installation works). Proposals for the specific wording of this provision may be provided only after consultations with experts in this field.
Environmental impact assessment is required before implementing planned activities. However, activities for national defence, emergency response or war-related restoration work to eliminate the consequences of armed aggression against Ukraine during martial law are exempt.	Law of Ukraine on Environmental Impact Assessment (part 1, article 2–3)	The law does not specify the requirements for environmental impact assessment post-war reconstruction. Therefore, it could be perceived that waste processing facilities currently handling waste debris from destruction (e.g. due to hostilities, terrorist acts or emergencies) can continue to operate without assessment, even after the end of martial law.
Separate waste collection in settlements is carried out for paper, plastic, glass, metal, biowaste, textiles and hazardous household waste.	Law of Ukraine on Waste Management (part 2, article 6)	This provision does not specify the methods for creating conditions to ensure separate collection of different types of waste.
Hazardous substances must be removed from waste before or during recovery.	Law of Ukraine on Waste Management (part 4, article 6)	This provision does not consider the impossibility of recovering certain types of waste, in particular, asbestos-containing waste.
Construction and demolition business entities must separate their waste for collection, accounting and transfer for correct treatment.	Law of Ukraine on Waste Management (part 7, article 13)	This provision only provides for the obligation on entities not in the field of waste management and, therefore, only to those that are not required to have the appropriate permits and licences to perform the operation of waste collection, including hazardous waste.

Existing condition	Legislation	Highlights
Producers and owners of hazardous waste, except for hazardous waste as part of household waste.	Law of Ukraine on Waste Management (part 2, article 27)	The general requirement for hazardous waste management does not include hazardous waste that is part of household waste.
Producers and owners of hazardous waste are obligated to store hazardous waste separately from other types of waste in a way that does not pose a threat to human health and the environment.	Law of Ukraine on Waste Management (para. 1, part 2, article 27)	This provision presumes that all producers and owners of waste know exactly what the composition of all waste is, can identify hazardous waste among them, and know the requirements for storing such waste (including ways that do not pose a threat to human and environmental health).
Producers and owners of hazardous waste must ensure proper collection, transportation and processing of waste independently. It is necessary to either obtain a permit for waste processing and hazardous waste management, or to enter into an agreement with a business entity in the field of waste management. Such business entities in the field must have the necessary permits.	Law of Ukraine on Waste Management (para. 1, part 2, article 27; para. 1, part 3, article 27)	This creates a false impression regarding the need for such persons to have only a licence for hazardous waste-management activities without the need to obtain a licence for hazardous waste transportation activities.
Hazardous household waste must be labelled after collection by the business entity in the field of waste management.	Law of Ukraine on Waste Management (part 2, article 28)	During the transportation of household waste containing hazardous waste, such hazardous waste must already be properly labelled. This is only possible if the hazardous waste has been collected separately from other household waste.
Mixed hazardous waste must be separated by the producer or owner of the waste if and when it is technically feasible and safe for human health and the environment.	Law of Ukraine on Waste Management (part 4, article 29)	This provision does not define the criteria for assessing the technical feasibility or infeasibility of waste separation. At the same time, the law effectively allows business entities that are aware of the presence of hazardous waste – for example, in household waste – to carry out transportation operations, despite the absence of technical means for separation. This thereby endangers the lives and health of workers performing such transportation.
Bulky waste, repair waste, hazardous waste and waste from green plantings are collected separately from other household waste.	Law of Ukraine on Waste Management (part 3, article 30)	This obligation can be fulfilled only if the waste is handed to the business entities in the field of waste management in a sorted form.
The management of hazardous waste includes a range of operations for the collection and processing of hazardous waste.	Law of Ukraine on Waste Management (para. 1, part 1, article 44)	The management of hazardous waste is a range of operations that involve the collection and processing of hazardous waste. At the same time, the performance of only one of these operations, as well as transportation, does not constitute hazardous waste management.

Existing condition	Legislation	Highlights
Business entities can accept and store hazardous waste for up to one year without a management licence, provided they transfer it to a licensed entity and report it to the waste-management information system.	Law of Ukraine on Waste Management (para. 1, part 2, article 44)	Despite all potential threats to human life and health (including their employees), business entities can accept and store hazardous waste for a calendar year without the appropriate licence, regardless of the type and degree of hazard, by means as simple as entering the relevant information into the waste-management information system.
The collection of household hazardous waste does not require a licence for the management of hazardous waste.	Law of Ukraine on Waste Management (para. 1, part 2, article 44)	Business entities collecting waste, regardless of the type and degree of hazard of the waste in household waste, can carry out such activities without a licence.
Waste owners whose activities result in the generation of hazardous waste, or owners of non-hazardous waste whose annual volume exceeds 50 tons, must submit a waste declaration once a year.	Law of Ukraine on Waste Management (part 1, article 45)	This provision contradicts the provision in part 1 of article 1 (para. 12) of the Law of Ukraine on Waste Management, which states that a waste declaration is a document submitted by waste producers.
Asbestos-related work is classified as high-risk and requires compliance with occupational health and safety legislation.	Resolution No. 77, which outlines the list of types of high-risk work, approved by the Cabinet of Ministers of Ukraine (CMU) (Ukraine, Cabinet of Ministers 2021, para. 22 of group B)	This provision does not correspond to the dangers of asbestos and to the ban on its use provided by part 3 of article 28 of the Law of Ukraine on the Public Health System.
The transportation of hazardous cargo and hazardous waste by road, rail and international transport (addressed in Resolution No. 314).	Resolution No. 314, which outlines the list of types of economic activities that cannot be carried out based on the submission of a declaration under martial law conditions (Ukraine, Cabinet of Ministers 2022c, appendix 2)	The legislation of Ukraine provides for the possibility of transporting hazardous waste not only by road and rail but also by inland water, sea and air transport, which can currently be carried out based on a declaration of economic activity.
Business declarations submitted for the implementation of economic activities related to waste processing operations remain valid for nine months after amendments take effect.	Resolution No. 1137, which outlines amendments to appendix 2 of Resolution No. 314 (Ukraine, Cabinet of Ministers 2023, para. 2)	Under this provision (originally valid until 9 October 2024), business entities can carry out activities related to waste processing, including hazardous waste and hazardous waste in household waste, without obtaining the appropriate permit based on a declaration of such economic activity.
The detection and accounting of waste from destruction must be organized by an authorized body.	Resolution No. 1073, which presents the procedure for handling waste generated due to destruction of buildings as a result of hostilities (Ukraine, Cabinet of Ministers 2022b, para. 6)	This provision does not establish requirements for the representatives of the authorized body, including specialized knowledge in waste management, expertise to identify specific types of hazardous waste, or the need for laboratory tests to determine their composition and the presence of hazardous components.

Existing condition	Legislation	Highlights
<p>The accounting of waste from destruction is carried out at the place of their generation, at the temporary storage sites or at waste processing facilities.</p>	<p>Resolution No. 1073, which presents the procedure for handling waste generated due to destruction of buildings as a result of hostilities (Ukraine, Cabinet of Ministers 2022b, para. 7)</p>	<p>The detection of hazardous waste in the waste from destruction may occur at the stage of delivering such waste to temporary storage sites or waste processing facilities, potentially exposing individuals involved in these operations to significant health and/or life risks. Given the limitations on conducting waste operations at temporary storage sites, hazardous waste in the destruction waste may be stored for an extended period without complying with the requirements for hazardous waste storage and disposal, thus posing a threat to the health and safety of a broader population.</p>
<p>Initial clearing of areas involves collecting destruction waste and, if possible, sorting its components separately</p>	<p>Resolution No. 1073, which presents the procedure for handling waste generated due to destruction of buildings as a result of hostilities (Ukraine, Cabinet of Ministers 2022b, para. 15, subpara. 1)</p>	<p>This provision refers to the physical collection of waste and the physical separation of its individual components, rather than collection and sorting as defined in the Law of Ukraine on Waste Management.</p>
<p>Resolution No. 1073 para. 15, subpara. 2: The transportation of destruction waste from the place of generation to waste-management facilities or temporary storage sites.</p>	<p>Resolution No. 1073, which presents the procedure for handling waste generated due to destruction of buildings as a result of hostilities (Ukraine, Cabinet of Ministers 2022b, para. 15, subpara. 2)</p>	<p>This provision refers to the physical collection of waste and the physical separation of its individual components, rather than collection and sorting as defined in the Law of Ukraine on Waste Management.</p>
<p>Resolution No. 1073, para 15, subpara 4: The storage of destruction waste at temporary storage sites or waste processing facilities (until their utilization or disposal)</p>	<p>Resolution No. 1073, which presents the procedure for handling waste generated due to destruction of buildings as a result of hostilities (Ukraine, Cabinet of Ministers 2022b, para. 15, subpara. 4)</p>	<p>This provision allows for the possibility of storing waste for much longer than one year, without complying with environmental and sanitary-epidemiological requirements.</p>
<p>Clearing works involves collecting and sorting destruction waste at the site of generation (if possible) and transporting it, often using special equipment, to waste-management facilities or temporary storage sites.</p>	<p>Resolution No. 1073, which presents the procedure for handling waste generated due to destruction of buildings as a result of hostilities (Ukraine, Cabinet of Ministers 2022b, para. 19)</p>	<p>As in paragraph 15, this provision allows for the possibility of storing waste for much longer than one year, without complying with environmental and sanitary-epidemiological requirements.</p>
<p>Sorting or separate collection should be organized during the area clearing, if technically feasible.</p>	<p>Resolution No. 1073, which presents the procedure for handling waste generated due to destruction of buildings as a result of hostilities (Ukraine, Cabinet of Ministers 2022b, para. 20)</p>	<p>The possibility of sorting or separate collection depends solely on technical feasibility and does not depend on the composition of the waste, particularly the presence of hazardous waste. Furthermore, this paragraph does not specify who should organize the sorting or separate collection (i.e. the owner of the damaged building, the contractor performing the demolition work, the authorized body or other persons).</p>

Existing condition	Legislation	Highlights
If the owner or manager of the object (defined in para. 5) intends to independently clear the areas, including collecting and sorting destruction waste at the place of generation and transporting it where necessary, such work can commence after receiving information from the authorized body that urgent work has been completed (para. 18).	Resolution No. 1073, which presents the procedure for handling waste generated due to destruction of buildings as a result of hostilities (Ukraine, Cabinet of Ministers 2022b, para. 22)	This provision suggests that the aforementioned work can be carried out by individuals who neither have the necessary permits nor any knowledge about handling hazardous waste (which may expose them to negative effects of hazardous waste) if they only receive information about the completion of urgent work.
Before starting demolition work, the contractor (performer) must ensure the removal (separation) of components that may contain hazardous waste (e.g. asbestos-containing waste). During demolition, measures should be taken to minimize the hazardous impact on human health and the environment, including potential emissions of asbestos dust, and, waste should be sorted for further processing and disposal, if possible.	Resolution No. 1073, which presents the procedure for handling waste generated due to destruction of buildings as a result of hostilities (Ukraine, Cabinet of Ministers 2022b, para. 24)	These provisions place waste-management responsibilities on the demolition contractor, who is not a business entity in the waste-management sector.
During martial law and for 90 days after its termination or lifting, the Kyiv and regional military administrations must decide on the placement of temporary storage sites for demolition waste if its volume exceeds the capacity of existing waste-management facilities or if such facilities are absent.	Resolution No. 1073, which presents the procedure for handling waste generated due to destruction of buildings as a result of hostilities (Ukraine, Cabinet of Ministers 2022b, para. 25)	The procedure does not include provisions regarding the further management of waste on temporary storage sites after the period of martial law and for 90 days after its termination or lifting.
Temporary storage sites must meet the following requirements: <ul style="list-style-type: none"> • Solid, level base (e.g. concrete, asphalt or compacted soil) • Organized system for water drainage resulting from precipitation (if needed) • Fenced perimeter (if needed) • Provision of lighting of the area (if needed) • Equipped entry points and access roads ensuring unobstructed passage of vehicles 	Resolution No. 1073, which presents the procedure for handling waste generated due to destruction of buildings as a result of hostilities (Ukraine, Cabinet of Ministers 2022b, para. 27)	Part of the provisions mentioning “...covered with a geomembrane layer at least 1.5 millimetres thick, protected from mechanical damage by a layer at least 0.5 metres thick”, which was previously specified, were excluded by the CMU in Resolution 964 (dated 23 August 2024). Exclusion of this provision eliminates the need for installation of a key protective layer at temporary storage sites, which prevents soil and groundwater contamination (particularly by the liquid components of the waste) as well as precipitation that will fall on the waste and seep through it into the soil.
Only the main components of demolition waste, free from hazardous contamination, are processed (recycled) at temporary storage sites.	Resolution No. 1073, which presents the procedure for handling waste generated due to destruction of buildings as a result of hostilities (Ukraine, Cabinet of Ministers 2022b, para. 28)	The procedure does not include requirements for managing hazardous waste within demolition waste.
Reuse of insulation and construction materials containing asbestos is required.	Resolution No. 1073, which presents the procedure for handling waste generated due to destruction of buildings as a result of hostilities (Ukraine, Cabinet of Ministers 2022b, appendix 1, para. 6)	This provision is not in line with the requirements of the Law of Ukraine on the Public Health System.

Existing condition	Legislation	Highlights
Asbestos-containing waste must be collected using PPE, and collection sites must be moistened. Collected waste must be packaged to prevent environmental contact and transported to the disposal site. After stacking at the disposal site, it must be covered with an insulating layer of at least 75 cm.	Resolution No. 1073, which presents the procedure for handling waste generated due to destruction of buildings as a result of hostilities (Ukraine, Cabinet of Ministers 2022b, note to appendix 1, para. 1)	This provision is not mandatory.
By submitting an application, the compensation recipient agrees to take measures to minimize the negative impact on human health and the surrounding natural environment during construction work. Appendix 1 lists potential negative impacts from waste formation from destruction, construction and demolition (including asbestos-containing waste, slate, pipes, fibreboard and cardboard).	Resolution No. 600, which outlines the procedure for providing compensation for destroyed real-estate objects (Ukraine, Cabinet of Ministers 2023b, para. 7)	This provision places obligations on individuals who usually lack knowledge about the hazards posed by hazardous waste (specifically, asbestos) to handle such waste, which may cause significant harm to their health.
The applicant must submit a declaration annually by February 20 of the year following the reporting year.	Resolution No. 556, which outlines the procedure for submitting waste declarations (Ukraine, Cabinet of Ministers 2022d, para. 4)	If the activities of a waste producer or owner lead to the formation of hazardous waste, informing government authorities about this may be delayed for a significant period, during which such waste may pose a threat to human life and health.
The highlight pertains to the provisions of the State Sanitary Norms and Regulations in their entirety.	Order No. 1013, which presents the State Sanitary Norms and Regulations on Safety and Protection of Workers from the Harmful Effects of Asbestos and Asbestos-Containing Materials and Products (Ministry of Health of Ukraine 2023)	There is an inability to practically implement several of its provisions due to the lack of sufficient laboratories capable of determining the presence and concentration of asbestos in the air, as well as the duration required for such analyses.
Employers must regularly measure asbestos fibres in the air at the workplace, though the frequency of such measurements is not specified.	Order No. 1013, which presents the State Sanitary Norms and Regulations on Safety and Protection of Workers from the Harmful Effects of Asbestos and Asbestos-Containing Materials and Products (Ministry of Health of Ukraine 2023, section II, para. 9)	This provision does not specify the frequency of measurements of asbestos fibres in the air at the workplace.
Air sampling from work zones must be analysed in accredited laboratories.	Order No. 1013, which presents the State Sanitary Norms and Regulations on Safety and Protection of Workers from the Harmful Effects of Asbestos and Asbestos-Containing Materials and Products (Ministry of Health of Ukraine 2023, para. 12)	Due to the insufficient number of laboratories and the duration of such analyses, it is practically impossible to ensure regular and timely determination of asbestos concentration in work zones for timely measures to reduce concentration.

Existing condition	Legislation	Highlights
Examples of normative legal acts that must be updated to comply with the Law of Ukraine on the Public Health System		
Consultations on measures to limit asbestos concentration in the air must occur before activities begin, with workers (or their representatives) responsible for health and safety at the enterprise or institution.	Order No. 1013, which presents the State Sanitary Norms and Regulations on Safety and Protection of Workers from the Harmful Effects of Asbestos and Asbestos-Containing Materials and Products (Ministry of Health of Ukraine 2023, section II, para. 22)	The list of measures to ensure protection from work that could exceed the asbestos concentration limit – and thus potentially harm workers' health – depends on the competence and awareness of the manager and workers responsible for health and safety at the enterprise or institution.
Asbestos removal or disposal must be carried out by licensed business entities under hazardous waste-management legislation.	Order No. 1013, which presents the State Sanitary Norms and Regulations on Safety and Protection of Workers from the Harmful Effects of Asbestos and Asbestos-Containing Materials and Products (Ministry of Health of Ukraine 2023, section II, para. 28)	This paragraph does not clearly define what constitutes asbestos removal or disposal, and removal may be understood in the context of the now-invalid 1998 Law of Ukraine "On Waste".
Asbestos must be packaged in strong, airtight, dust-proof containers (e.g. paper or synthetic bags, soft specialized containers), and plastic materials used for packaging must be UV-resistant.	Order No. 1013, which presents the State Sanitary Norms and Regulations on Safety and Protection of Workers from the Harmful Effects of Asbestos and Asbestos-Containing Materials and Products (Ministry of Health of Ukraine 2023, section V, para. 2)	This paragraph does not specify any requirements for the specific material of the container nor its density. Furthermore, packaging asbestos in paper bags does not consider the ease with which they can be torn during packing, transportation, etc.
Several normative legal orders that remain to stipulate the possibility of using asbestos or ACM		
If metal stoves are installed in vehicles used for transporting repair crews (workers), the installation scheme must be approved by the fire safety service. Additionally, the combustible flooring beneath the stoves must be covered with sheet metal over asbestos, with an overlap of 0.1 metres.	Fire Safety Rules in the Field of Communications (State Service of Special Communications and Information Protection of Ukraine and the Ministry of Internal Affairs of Ukraine 2016, section 2, para. 24) ³⁶	This provision provides for the use of asbestos that is not in line with the requirements of the Law of Ukraine on the Public Health System.

³⁶

This follows the Law of Ukraine on the Legal Regime of Martial Law.

Existing condition	Legislation	Highlights
<p>At radio stations:</p> <ul style="list-style-type: none"> Cabinets placed on wooden floors or pedestals must be installed on metal sheets (0.3–1.0 mm thick) with an asbestos underlayer sheet (3–5 mm thick). Inner surfaces of troughs and their covers, made of wood, must be lined with roofing iron (0.3–0.5 mm thick) over a layer of asbestos (3.0 mm thick). 	<p>Fire Safety Rules in the Field of Communications (State Service of Special Communications and Information Protection of Ukraine and the Ministry of Internal Affairs of Ukraine 2016, section 7, para. 6)</p>	<p>This provision provides for the use of asbestos that is not in line with the requirements of the Law of Ukraine on the Public Health System.</p>
<p>During hot work on equipment in the dust preparation system, any structures and equipment within a 5-metre radius that could catch fire must be cleaned of dust deposits and securely protected with a metal screen, asbestos or by being doused with water.</p>	<p>Fire Safety Rules during the Operation of Thermal Mechanical Equipment of Power Stations, Heat Networks, and Heat Utilization Installations (Ukraine, Ministry of Energy and Coal Industry 2013, section 1, para. 1.17)</p>	<p>This provision provides for the use of asbestos that is not in line with the requirements of the Law of Ukraine on the Public Health System.</p>
<p>The worksite must have sheet asbestos, a fire extinguisher and a metal sheet for adjusting the burner flame.</p>	<p>Fire Safety Rules during the Operation of Thermal Mechanical Equipment of Power Stations, Heat Networks, and Heat Utilization Installations (Ukraine, Ministry of Energy and Coal Industry 2013, section 1, para. 1.20)</p>	<p>This provision provides for the use of asbestos that is not in line with the requirements of the Law of Ukraine on the Public Health System.</p>
<p>During hot work in the pump room, combustible structures and equipment within a 5-metre radius must be securely protected (with a metal screen, asbestos or by being moistened with water) and precautions must be taken to prevent sparks from reaching other combustible structures located on lower platforms and floors.</p>	<p>Fire Safety Rules for Companies, Enterprises, and Organizations in the Energy Sector of Ukraine (Ukraine, Ministry of Energy 2018, section VII, para. 3, subpara. 20)</p>	<p>This provision provides for the use of asbestos that is not in line with the requirements of the Law of Ukraine on the Public Health System.</p>
<p>For safety devices of dust preparation equipment inside buildings, diaphragms made of asbestos or metal (e.g. soft tin or aluminium) must be used.</p>	<p>Fire Safety Rules for Companies, Enterprises, and Organizations in the Energy Sector of Ukraine (Ukraine, Ministry of Energy 2018, section VIII, para. 1, subpara. 14)</p>	<p>This provision provides for the use of asbestos that is not in line with the requirements of the Law of Ukraine on the Public Health System</p>
<p>During hot work in the pump room, combustible structures and equipment within a 5-metre radius must be securely protected (with a metal screen, asbestos or by being moistened with water).</p>	<p>Fire Safety Rules for Companies, Enterprises, and Organizations in the Energy Sector of Ukraine (Ukraine, Ministry of Energy 2018, section VIII, para. 2, subpara. 18)</p>	<p>This provision provides for the use of asbestos that is not in line with the requirements of the Law of Ukraine on the Public Health System.</p>

Existing condition	Legislation	Highlights
Fire safety boards must be equipped with two or more foam or carbon dioxide fire extinguishers, one powder extinguisher, an asbestos blanket, a fire-resistant cloth, a water container or a box of sand.	Fire Safety Rules for Companies, Enterprises, and Organizations in the Energy Sector of Ukraine (Ukraine, Ministry of Energy 2018, section XII, para. 3, subpara. 3)	This provision provides for the use of asbestos that is not in line with the requirements of the Law of Ukraine on the Public Health System.
Glass containers with acids, alkalis or other corrosive substances must be transported in metal or wooden boxes lined with asbestos.	Fire Safety Rules in the Ministry of Defence of Ukraine (Ukraine, Ministry of Defence 2019, section 7, para. 14)	This provision provides for the use of asbestos that is not in line with the requirements of the Law of Ukraine on the Public Health System.
Glassware containing acids, alkalis or other corrosive substances must be transported in metal or wooden boxes lined with asbestos.	Fire Safety Rules in the Ministry of Defence of Ukraine (Ukraine, Ministry of Defence 2019, section 4, para. 7)	This provision provides for the use of asbestos that is not in line with the requirements of the Law of Ukraine on the Public Health System.
Vehicles or artillery tractor loaded with ammunition must be equipped with a 1.5 × 1.5 metre asbestos (or felt) blanket.	Fire Safety Rules in the Ministry of Defence of Ukraine (Ukraine, Ministry of Defence 2019, section 6, para. 5)	This provision provides for the use of asbestos that is not in line with the requirements of the Law of Ukraine on the Public Health System.
During work involving open flames, portable felt or asbestos shields must be installed at the worksites to prevent sparks from scattering.	Fire Safety Rules in the Ministry of Defence of Ukraine (Ukraine, Ministry of Defence 2019, section 1, para. 11)	This provision provides for the use of asbestos that is not in line with the requirements of the Law of Ukraine on the Public Health System.
Fabric sleeves for heaters must be attached only with the side that has internal heat insulation made of asbestos fabric.	Fire Safety Rules in the Ministry of Defence of Ukraine (Ukraine, Ministry of Defence 2019, section 2, para. 8)	This provision provides for the use of asbestos that is not in line with the requirements of the Law of Ukraine on the Public Health System.

4.2 Asbestos presence in debris

4.2.1 Presence given from the historical and current use of asbestos

Over 70 per cent of the roofs of residential and public buildings in Ukraine are covered with corrugated asbestos-cement slates, which consist of 10–15 per cent chrysotile asbestos. Additionally, flat slate is commonly used as fencing material, and asbestos-cement pipes are found in water-supply and heat-removal systems (Ministry of Environmental Protection and Natural Resources of Ukraine 2024).

The presence of ACM is visible across all types of structures and buildings in Ukraine, all of which have sustained damage. Each building type and ACM requires a different approach based on the composition, quantity and location of ACMs within these buildings, including:

- Residential buildings (single-storey houses to multistorey high rise)
- Commercial and industrial sites (super-structures and hazardous wastes)
- Municipal infrastructure (power, water, sewage treatment, gas etc.)

While the extent of ACM presence has not been verified by UNEP, available documentation does illustrate the widespread use of ACMs and highlights the challenges of managing debris from war-damaged structures in Ukraine.

4.2.2 Identifying asbestos and asbestos-containing debris

There is currently no clear regulatory framework for determining whether debris is asbestos-containing debris, as the extent of asbestos contamination is complicated by the different types of asbestos and the way ACMs are within the debris.

Assuming that ACMs can be identified within war-damaged buildings and debris, the current most applicable approach to identifying ACMs in debris is provided within version 5 of the UNDP Asbestos Waste Management Protocol (UNDP, 2023b). This protocol details the approach to managing ACMs within the debris of war-damaged buildings, beginning with an initial visual assessment of the building or debris by a competent and trained asbestos surveyor. The asbestos surveyor would look for the following:

- Asbestos-containing building materials, such as corrugated slate, flat slate (asbestos-cement board) and pipes
- Asbestos-containing insulating materials and low-density products (1 g/cm³), such as asbestos fabric, asbestos cardboard, asbestos cord and paronite

Due to the lack of clear Ukrainian guidelines and publications on identifying ACMs in damaged buildings and debris, reliance is currently on competent asbestos surveyors, of which there are very few in Ukraine. This reflects the recent identification of asbestos as a health hazard in Ukraine, which requires specific controlled handling procedures. However, there are examples from other countries and regions available for identifying asbestos and ACMs, including those specifically addressing post-disaster asbestos handling (see Table 6).

Table 6: Examples of guidelines for managing asbestos and ACMs in various regions

Guideline title	Author	Year	Region focus
Practical Guidelines for the Information and Training of Workers Involved with Asbestos Removal or Maintenance Work	European Union	2012	EU
Guidance for Catastrophic Emergency Situations Involving Asbestos	United States Environmental Protection Agency	2009	United States
The Environmentally Sound Management (ESM) of Asbestos Wastes in Tsunami-affected Countries in South and Southeast Asia	Basel Convention Regional Centre for South-East Asia (BCRC-SEA)	2011	South and Southeast Asia
A Brief Guide to Asbestos in Emergencies: Safer Handling and Breaking the Cycle	Shelter Centre and ProAct Network	2017	China, Kosovo and The Maldives
Guidelines for Managing Asbestos at the Bakalian Disposal Site	UN-Habitat	2021	Lebanon
Good Practice Guidance for the Management and Control of Asbestos: Protecting Workplaces and Communities from Asbestos Exposure Risks	Asian Development Bank	2022	Asia
Manual for Preventing Asbestos Dispersion During Disasters	Japan Ministry of Environment	2023	Japan
Supporting the Winterization Response in Ukraine	UNOPS	2023	Ukraine
Asbestos Waste Management Protocol for UNDP Contractors and Partners (Version 5.0)	UNDP Ukraine	2023	Ukraine
Pragmatic Guidance for Emergency Repairs of Structures That May Contain Asbestos in Ukraine	Miyamoto International	2023	Ukraine
White Paper on A Methodology for Handling of Asbestos-Containing Materials in Line with the New Legislation in Ukraine	CES Clean Energy Solutions, Neo- Eco Ukraine, iC Consulente Ukraine	2024	Ukraine



Fig. 5. Different types of common asbestos use within the Ukrainian built environment (From left: corrugated asbestos roofing for balconies, asbestos cement for waste chutes within residential apartment blocks, and flat slates with asbestos used on balconies)

Photo credit: NGO Chemical Safety Agency/Denys Pavlovskiy)



Fig. 6. Presence of asbestos-containing materials within mixed debris at dumpsites where debris arises from local demolition and debris removal works, featuring significant number of corrugated roofing sheets (the most common type of asbestos found in the Ukrainian built environment)

Photo credit: NGO Chemical Safety Agency/Denys Pavlovskiy)



Fig. 7. Temporary storage of asbestos-containing materials at two different sites in Ukraine with bagged ACMs under a roof structure (left) and bagged, wrapped and palletted ACMs in the outdoors (right)

Photo credit: NGO "Chemical Safety Agency" is a member of the Public Council of the Ministry of Environment)

4.3 Handling and management of debris and asbestos-containing debris

The war in Ukraine has generated substantial quantities of debris requiring meticulous handling and management. The debris includes destroyed infrastructure, vehicles, munitions and other materials. Given the historical use of asbestos and its recent regulation, asbestos is expected to be widely present in debris from damaged residential buildings and other infrastructure throughout Ukraine.

Several projects and initiatives on debris management are under way in Ukraine to support its recovery from the war, including those run by communities and NGOs. The Congress of Self-Government of Ukraine has been working with Miyamoto International and O.M. Beketov National University of Urban Economy in Kharkiv to assess damage criteria for buildings that may contain ACMs and develop safe practices for handling asbestos. Debris samples from damaged buildings are analysed at the university to determine asbestos contamination and develop methods for safely managing destruction waste (including asbestos-containing waste) for communities. Miyamoto International also collected samples that were shipped to Japan for independent testing, confirming the presence of asbestos in all samples from building rubble across the region.

International organizations, such as UNDP, are addressing local empowerment and promoting environmental sustainability through debris recycling programmes. These programmes involve processing debris into usable building materials for construction, as well as managing the restitution process, site clean-up and material recycling. Local and municipal governments are also actively involved in debris management efforts, including site clean-up and recycling (UNDP 2023c; UNDP 2024).

International support also addresses the risk of asbestos in the generated debris. For example, JICA has been supporting the Government of Ukraine for the “Project for Emergency Recovery and Reconstruction” in Kyiv oblast, particularly focusing on the proper handling of ACM and recycling of non-ACM. JICA is currently on the piloting stage to continuously improve the implementation of the guidelines for managing destruction waste outlined in resolution 1073, and capacity-building of local governments that are working on debris management by using equipment provided by JICA.³⁷

Several shelters have been established in the war-impacted areas of Ukraine. Shelter and Non-Food Item (SNFI) Cluster is one of the projects partnering directly with local communities and shelters in the affected areas on the ground. Although not directly dealing with debris management, the project continuously receives

requests for assistance in dealing with debris of asbestos. SNFI Cluster, along with its partners, has been conducting workshops periodically for relevant stakeholders to increase awareness on the risks and hazards of asbestos and ACM.

Examples from the private sector include Miyamoto International and Neo-Eco, which have established projects in several regions of Ukraine. From their work on the ground, Miyamoto International has undertaken and supervised a range of repair works on damaged buildings, including the removal of ACM. To ensure the safety of its own workers and contractors, Miyamoto International developed a set of pragmatic guidelines for managing asbestos during repairs in the emergency phase (Miyamoto International Inc. 2023). These efforts were further enhanced by a second set of pragmatic guidelines for the management and controlled demolition of larger structures that may contain asbestos or asbestos-containing debris (Miyamoto International Inc. 2024).

Neo-Eco addresses waste management, including debris, by identifying demolition waste based on type and assessing the potential for recycling non-ACMs or properly disposing of asbestos debris. In a white paper co-authored by CES Clean Energy Solutions, Neo-Eco and iC Ukraine, the importance of screening for asbestos-containing debris, proper handling, risk management, and gap assessments in managing of debris and ACMs was highlighted (Helbl et al. 2024).

A stakeholder meeting on 4 July 2024 in Kyiv brought together multiple relevant stakeholders and provided insight into the challenges of carrying out debris management on the ground. Key challenges include:

- It is difficult to meet the need to estimate the volume of generated debris and harmonized methods for doing so. This includes determining the composition of asbestos and ACM resulting from the war. Such data is crucial for identifying treatment options, processing capacity and overall debris management.
- On the screening of asbestos debris as well as asbestos within generated debris, there is a crucial need to increase the capacity of national laboratory for qualitative and quantitative analyses of asbestos. Although several laboratories can conduct asbestos analysis, they are not ISO-accredited and national standardization methods are also underdeveloped due to the recently established asbestos regulations. The absence of clear standards for asbestos contamination and screening of asbestos composition in the debris also impacts the ability to segregate recyclable debris from asbestos-containing debris that requires safe handling and disposal.

³⁷ Japan International Cooperation Agency (JICA), <https://www.jica.go.jp/english/activities/issues/>

- Despite ongoing work and projects, the number of facilities for sorting, treating, recycling and disposing of debris in compliance with current regulations is inadequate to manage the significant volume. For example, some debris management projects struggle to identify suitable final disposal for asbestos due to the limited capacity of available specialized landfills for accepting asbestos-containing debris. Additionally, equipment for safely treating, sorting and recycling debris is insufficient. The support for and establishment of such facilities must comply with national regulations and EU standards.
- Considering the status of asbestos as hazardous materials in Ukraine, entities that conduct waste management must acquire a licence to collect, handle, recycle and dispose of debris (including asbestos-containing debris). Currently, the number of licensed organizations and companies available in Ukraine are insufficient to handle the significant debris volume.
- A comprehensive, national-level strategy for managing, safely reusing or recycling debris as secondary raw materials for reconstruction has not yet been established. Such a framework would assist local communities, local government, national entities (e.g. private sector and non-profits) and international organizations in harmonizing their efforts in debris management.

4.4 Financial instrument on asbestos Asbestos removal and subsequent

Asbestos removal and subsequent management as a hazardous waste is a relatively new concept in Ukraine, becoming a requirement since the Public Health System Law was passed and enforced 1 October 2023. Previously, no mechanism existed to pay for this service, whereas in EU member countries, building owners are responsible for funding such activities. Asbestos removal and disposal are often part of a demolition or rehabilitation projects, or occur when asbestos must be removed to allow for continued use of a building.

Given the extent of damage in Ukraine and the significant financial burden of handling asbestos, it is unlikely that most building owners can afford to remove and dispose of ACMs within their buildings.

From past debris management efforts following natural disasters, it is clear that large-scale debris management, including asbestos handling and disposal, is often funded by national governments. For example, in the United States, the Federal Emergency Management Agency (FEMA) funds such works from federal emergency allocated funds. Similarly, in Japan, following the Great East Japan Earthquake of March 2011, the central government funded local authorities to carry out large-scale debris

For Ukraine, it is therefore anticipated that the national government will need to allocate a central budget to support war-affected regional and local governments in implementing debris management works, including asbestos handling and disposal.

Box4

Protecting human health, green recovery and EU accession

Asbestos is a risk to human health, with numerous countries globally having robust regulations in place to protect people's safety and health during work involving ACMs, and to ensure environmentally sound disposal of asbestos requirements.

Ukraine has only recently started on the road to implementing a robust regulatory framework for asbestos management, with numerous additional by-laws and specifications required to meet the requirements of, for example, the EU. To achieve EU accession, these additional steps will need to be demonstrated as implemented and enforced by Ukraine over the coming years.

Furthermore, given the extent of potential asbestos contamination within the debris, and the intent to recycle the debris into (re)construction materials, there are significant challenges to recycling the optimal amount of debris in Ukraine. Such recycling ambitions would underpin ambitions for a "green recovery" in Ukraine, both by introducing a circular economy and reducing the burden on natural raw materials (i.e. gravel, sand and aggregates from quarries).

05 Conclusion and recommendation

- ACMs pose a significant hindrance to reconstruction and recovery efforts in Ukraine, placing a heavy burden on communities and local governments in war-affected regions.
 - On the ground, the challenge of managing asbestos-containing debris has been highlighted by local and regional governments and by council authorities, with clear requests for support from the international community. There are also civil society organizations (CSOs) that have established networks with local communities, experts and academia that can contribute to solutions.
 - Urgent activities needed on the ground include:
 - Safe handling, treatment and disposal of asbestos-containing debris, including practical solutions for challenges arising in the existing debris management efforts (e.g. permits for disposal, handling in front-line shelters, etc.)
 - Development of both immediate-phase and long-term strategies for managing asbestos-containing debris, with emphasis on separation due to historical use and potential extensive contamination, along with practical steps
 - Practical solutions for handling, treating and disposing of ACMs during the rehabilitation and reconstruction process
 - Strengthening analytical and laboratory capacity to analyse asbestos
 - The assessment and recommendations focus on the immediate phase, but also consider long-term strategies (e.g. green recovery and potential EU accession).
 - A national-level coordination platform is needed to harmonize efforts on debris management, with particular attention to asbestos-containing debris
- A road map recommendation for managing asbestos-containing debris in Ukraine is presented in table 7.
- Future measures and efforts should include prioritisation of gender-responsive strategies to ensure both men and women are adequately protected from asbestos exposure and its associated risks
 - Multiple approaches exist for managing and treating asbestos-containing debris. The next steps involve defining and assessing these options (e.g. strengths, weaknesses, opportunities and threats (SWOT) analysis, time, cost, risk, liability, safety, regulation, testing capacity, etc.) to support informed decision-making by local governments on asbestos and ACM debris management.

Table 7: Recommendation of road map on the management of asbestos-containing debris in Ukraine

Activities	Leading agency	Partners
Short term		
Prepare safety awareness campaign materials concerning asbestos and human health risks for wide dissemination, to reach both men and women, addressing risks and protective measures relevant to each gender.	<ul style="list-style-type: none"> • National government • Ministry of Health • Ministry of Environmental Protection and Natural Resources 	<ul style="list-style-type: none"> • Public Health Centre of the Ministry of Health of Ukraine • Hygiene Regulation Committee of the Ministry of Health of Ukraine • WHO
Disseminate the safety awareness campaign materials among citizens and contractors.	<ul style="list-style-type: none"> • Municipalities • Regional health departments • Ministry of Environmental Protection and Natural Resources, and their regional departments 	<ul style="list-style-type: none"> • Public Health Centre of the Ministry of Health of Ukraine • Aarhus Environmental Information and Education Centre • WHO • Construction and Building Materials Workers Union of Ukraine (PROFBUD) • NGOs • Include post-war oblast and hromada administration
Establish a technical working group for asbestos-containing debris (e.g. overall debris management with a subgroup working on asbestos issues).	<ul style="list-style-type: none"> • Ministry of Environmental Protection and Natural Resources • Ministry for Communities and Territories Development • Ministry of Health 	<ul style="list-style-type: none"> • L.I. Medved's Research Centre of Preventive Toxicology, Food and Chemical Safety of the Ministry of Health of Ukraine • State Agency for Restoration and Development of Infrastructure of Ukraine
Define requirements for work in this field (drawing on the UNEP assessment report and workshop held in Kyiv in July 2024), and initiate trials for handling asbestos-containing debris.	<ul style="list-style-type: none"> • Technical working group • Ministry of Environmental Protection and Natural Resources • Ministry for Communities and Territories Development 	<ul style="list-style-type: none"> • United Nations agencies • Municipalities • Business entities in waste-management system • Contractors
Prepare clear guidance on permits and licensing for asbestos storage, treatment and disposal facilities.	<ul style="list-style-type: none"> • Ministry of Environmental Protection and Natural Resources 	<ul style="list-style-type: none"> • United Nations agencies • Business entities in waste-management system • Contractors
Improve the mechanism of maintaining a register of asbestos-containing debris and war-damaged buildings within the municipality.	<ul style="list-style-type: none"> • Municipalities • Ministry for Communities and Territories Development • Ministry of Environmental Protection and Natural Resources • Ministry of Digital Transformation 	<ul style="list-style-type: none"> • The State Environmental Inspectorate of Ukraine • United Nations agencies • United States Agency for International Development • Reform support teams of the Ministries of Ukraine
Report the presence of asbestos to oblast authorities for the oblast to determine the requirements for asbestos storage, treatment and disposal facilities.	<ul style="list-style-type: none"> • Municipalities • Authorized bodies (executive body of a village, town or city council, or military administration of a settlement, if established) 	<ul style="list-style-type: none"> • Contractors • Business entities in waste-management system • Donors

Activities	Leading agency	Partners
Short term		
Ensure that municipality debris management activities are safely performed with the correct PPE, procedures and outputs.	<ul style="list-style-type: none"> • The State Labour Service • Ministry of Health • The State Environmental Inspectorate 	<ul style="list-style-type: none"> • International Labour Organization • Ukraine Construction and Building Materials Workers' Union (PROFBUD) • NGOs
Establish and implement training courses for consultants, supervisors and construction managers on ACM identification, national and international standards, removal and treatment, monitoring and verification methods to become asbestos management professionals.	<ul style="list-style-type: none"> • Universities • Ministry for Communities and Territories Development • Ministry of Health 	
Review the current and new regulations on asbestos management by introducing asbestos management professionals as independent monitoring entities and define their responsibilities.	<ul style="list-style-type: none"> • Ministry of Health 	
Train national authorities responsible for hazardous waste management and operational health and safety (OHS) on the requirements for ACM management and monitoring.	<ul style="list-style-type: none"> • Universities • Ministry for Communities and Territories Development • Ministry for Environmental Protection and Natural Resources 	
Medium term		
Establish and maintain the required asbestos storage, treatment and disposal facilities within the oblast, with funding from central government.	<ul style="list-style-type: none"> • Cabinet of Ministers • Municipalities 	<ul style="list-style-type: none"> • International Technical Assistance Programme
Conduct a mapping project for Ukraine to show the most asbestos-contaminated areas, storage facilities and other tools.	<ul style="list-style-type: none"> • Oblasts • Ministry for Communities and Territories Development, and their regional departments • Ministry of Environmental Protection and Natural Resources, and their regional departments • Ministry of Digital Transformation 	<ul style="list-style-type: none"> • Reform support teams of the Ministries of Ukraine
Establish and maintain a national centre for the management of asbestos (with a specific focus on asbestos-containing debris), including consultations with the private sector	<ul style="list-style-type: none"> • National government with technical working group • Ministry of Health 	<ul style="list-style-type: none"> • Public Health Centre of the Ministry of Health of Ukraine • Hygiene Regulation Committee of the Ministry of Health of Ukraine • WHO

Activities	Leading agency	Partners
Medium term		
Prepare and disseminate training materials for asbestos management at all levels to the oblasts, municipalities and private sector.	<ul style="list-style-type: none"> • Ministry of Environmental Protection and Natural Resources • Ministry of Communities and Territories Development, • Ministry of Health • Ministry of Education and Science 	<ul style="list-style-type: none"> • United Nations agencies • NGOs • Volunteers • Educational Institutions
Determine the requirement for asbestos storage, treatment and disposal facilities within the oblast, where several municipalities may share a facility.	<ul style="list-style-type: none"> • Oblasts • Authorized bodies (executive body of a village, town or city council or military administration of a settlement, if established) • Ministry for Communities and Territories Development, and their regional departments • Ministry of Environmental Protection and Natural Resources, and their regional departments 	
Enforce the relevant regulations concerning asbestos within the oblast with inspectors and provide support to the municipalities	<ul style="list-style-type: none"> • Oblasts • State Environmental Inspectorate, and their regional departments • Ministry of Health, and their regional departments • Regional state labour administrations 	
Contribute to the national government's asbestos management reforms through participation in the relevant technical working groups.	<ul style="list-style-type: none"> • Private sector • Business entities in waste-management system or industry association • Contractors 	<ul style="list-style-type: none"> • United Nations agencies • Ukraine Construction and Building Materials Workers' Union (PROFBUD) • NGOs
Invest in asbestos storage, treatment and disposal facilities, once the regulatory framework has been reformed and enforced.	<ul style="list-style-type: none"> • Private sector • Business entities in waste-management system or industry association • Contractors 	<ul style="list-style-type: none"> • Delegation of the EU to Ukraine • European Bank for Reconstruction and Development (EBRD) • World Bank Group • United States Agency for International Development
Long term		
Complete further regulatory reform to ensure Ukrainian management of asbestos-containing debris is aligned with applicable EU regulations to enable EU accession.	<ul style="list-style-type: none"> • Ministry of Environmental Protection and Natural Resources • Ministry for Communities and Territories Development • Ministry of Health • Ministry of Education and Science 	<ul style="list-style-type: none"> • United Nations agencies • Ukraine Construction and Building Materials Workers' Union (PROFBUD) • NGOs • Ukrainian Construction Association

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Annex

I-A. Directives and regulations in Ukraine addressing asbestos, ACM and related products

- Council Directive 83/477/EEC of 19 September 1983, on the protection of workers from risks related to asbestos exposure at work (second individual directive issued under article 8 of Directive 80/1107/EEC)
- Article 24 of Directive 2009/148/EC of the European Parliament and of the Council repealed Directive 83/477/EEC, as amended by the directives listed in Annex (including Directive 91/382/EEC of 25 June 1991, and No. 2003/18/EC dated 27 March 2003), and stipulated that references to the repealed directive shall be construed as references to Directive 2009/148/EC (dated 30 November 2009)
- Council Directive 91/382/EEC of 1991, amending Directive 83/477/EEC on the protection of workers from the risks related to exposure to asbestos at work
- Directive 2003/18/EC of the European Parliament and of the Council of 27 March 2003, amending council Directive 83/477/EEC on the protection of workers from the risks related to exposure to asbestos at work

Before the Law of Ukraine on the Public Health System came into effect, the Ministry of Health of Ukraine and the Ministry of Environmental Protection and Natural Resources of Ukraine adopted several regulatory acts concerning asbestos and ACM, including:

- Order No. 1054 of the Ministry of Health (dated 20 June 2022) approved the Hygiene Standard “List of substances, products, production processes, household and natural factors carcinogenic to humans”. This list includes asbestos (all forms: actinolite, amosite, anthophyllite, chrysotile, crocidolite, fluoro-edenite amphibole fibres, tremolite) and mineral substances containing asbestos (talc, vermiculite, etc.) (CAS 017068-78-9). This standard also establishes the maximum allowable concentration of asbestos and asbestos-containing dust mixtures in the air of the working area and in atmospheric air.
- Order No. 1596 of the Ministry of Health of Ukraine (dated 14 July 2020) approved hygiene regulations for the permissible content of chemical and biological substances in the air of the working area, including asbestos fibre, silica-containing dust, silicates, aluminosilicates and chrysotile asbestos.

- Order No. 317 of the Ministry of Environmental Protection of Ukraine (dated 16 August 2004) approved the list of types of equipment for which standards for maximum permissible emissions of pollutants from stationary sources are being developed, including equipment (installations) for asbestos production and the manufacture of asbestos-containing products.
- Order No. 309 of the Ministry of Environmental Protection of Ukraine (dated 27 June 2006) approved the standards for maximum permissible emissions of pollutants from stationary sources. According to these standards, the maximum permissible emission of asbestos (chrysotile, crocidolite, amosite, anthophyllite, actinolite, tremolite) in the form of fine dust must not exceed 0.1 mg/m .
- Order No. 173 of the Ministry of Environmental Protection and Natural Resources of Ukraine (dated 19 June 1996) approved the State Sanitary Rules for Planning and Development of Settlements. These rules establish sanitary protection zones around enterprises involved in: asbestos products manufacturing (500 metres), asbestos extraction (300 metres) and asbestos-cement products (100 metres). Within these zones, the construction of residential buildings, social infrastructure facilities, and other objects related to permanent human occupancy is prohibited (Part 2 of article 114 of the Land Code of Ukraine).

Additionally, the CMU and the Ministry of Health of Ukraine have adopted a series of normative and legal acts concerning benefits for workers whose jobs involve asbestos, as well as the timely detection and recording of occupational diseases caused by asbestos exposure. These include:

- CMU Resolution No. 163 (dated 21 February 2001), which approved a list of industries, workshops, professions and positions with harmful working conditions that entitle workers to a reduced working week. This list includes several positions whose job duties involve interaction with asbestos and ACM.
- CMU Resolution No. 461 (dated 24 June 2016), which approved lists of industries, work types, professions, positions and indicators that qualify

for an early retirement pension under preferential conditions. This list also includes several positions whose job duties involve interaction with asbestos and ACM.

- Order No. 246 of the Ministry of Health of Ukraine (dated 21 May 2007), which approved the Procedure for Medical Examinations of Certain Categories of Workers. This procedure includes specific provisions for the examination of workers whose work environment and processes involve exposure to silicates and silicate-containing materials, including: asbestos and ACM (containing more than 10 per cent asbestos) and ACM (containing less than 10 per cent asbestos) such as asbestos-bakelite and asbestos-rubber.
- CMU Resolution No. 1662 (dated 8 November 2000), which approved a list of occupational diseases, including various illnesses caused by work involving asbestos and ACM exposure. These include:
 - Pneumoconiosis: silicosis, silicatosis, metal pneumoconiosis, carbon pneumoconiosis, hypersensitivity pneumonitis (berylliosis) and conio-tuberculosis (pneumoconiosis associated with tuberculosis)
 - Chronic bronchitis: dust-induced, toxic-dust-induced and emphysema-bronchitis
 - Tumours: cancers of the oral cavity, respiratory organs, mesothelioma and stomach
- Order 2020 of the Ministry of Health of Ukraine (dated 10 November 2022), which approved the Procedure for Collecting and Transmitting Information about Cases of Acute and Chronic Occupational Diseases (Poisonings) for the automated system of accounting and analysis. This procedure includes the collection and transmission of information about cases of asbestosis and mesothelioma caused by asbestos exposure at work.
- Other asbestos-containing products exceeding 200 tons per year
- Environmental impact assessment is a procedure for evaluating any potential consequences of planned activities, including:
 - Construction, reconstruction, technical re-equipment, expansion, repurposing or liquidation (dismantling) of objects
 - Impacts on: human health and safety, flora, fauna, biodiversity, soil, air, water, climate, landscape, natural territories and objects, historical monuments, cultural heritage objects and socioeconomic conditions resulting from changes in these factors (article 1, part 1, paras. 1 and 3)
- Order 1013 of the Ministry of Health of Ukraine (dated 5 June 2023) stipulates that the transportation of goods containing asbestos and ACM, as well as dust-generating products, must comply with: the Law of Ukraine "On the Transportation of Dangerous Goods" and the Rules for Road Transportation of Dangerous Goods approved by order 656 of the Ministry of Internal Affairs of Ukraine (dated 4 August 2018).
- Order No. 177 of the Ministry of Environmental Protection and Natural Resources of Ukraine (dated 10 May 2002) approved the Instruction on the Procedure and Criteria for State Registration of Objects that have or may have a harmful impact on human health and the state of atmospheric air. This instruction specifies a list of pollutants including asbestos, and it establishes threshold values for potential emissions, requiring state registration for facilities exceeding 0.001 tons per year of asbestos emissions.

Ukrainian legislation also regulates a range of procedures related to activities involving asbestos and ACM, including the following:

- The Law of Ukraine on Environmental Impact Assessment stipulates that facilities for the extraction, production and processing of asbestos and asbestos-containing products are classified as objects that may have a significant environmental impact and are therefore subject to environmental impact assessment (article 3, part 2, para. 5). This includes:
 - Asbestos-cement product manufacturing exceeding 20,000 tons per year
 - Friction material production exceeding 50 tons per year of finished products
- The Law of Ukraine on Waste Management
- The National Waste List (CMU Resolution 1102, dated 20 October 2023)
- The Waste Classification Procedure (CMU Resolution No. 1102, dated 20 October 2023)
- The Procedure for Issuing, Refusing to Issuance, and Cancellation of Permits for Waste Processing Operations (draft published on the website of the Ministry of Environmental Protection and Natural Resources of Ukraine on 15 June 2023)

I-B. Relevant regulation in Ukraine on ACM

To summarize the above information, it is recognized that ACM waste in Ukraine (classified as a component of demolition waste) is currently regulated and will continue to be regulated in the near future by the following legislation and regulatory-normative acts:

- The Law of Ukraine on the Public Health System
- Order No. 1013 of the Ministry of Health of Ukraine (dated 5 June 2023), on State Sanitary Norms and Regulations on Safety and Protection of Workers from the Harmful Effects of Asbestos and Asbestos-Containing Materials and Products
- The Procedure for Carrying Out of Emergency Work on Liquidation of Consequences of Military Aggression of the Russian Federation Related to Damage of Buildings and Structures (CMU Resolution 473, dated 19 April 2022)
- Resolution No. 474 of the CMU (dated 19 April 2022) on the Procedure for performing Work on the Dismantling of Objects Damaged or Destroyed Due to Emergency Situations, Military Actions or Terrorist Acts
- CMU Resolution No. 1073 (dated 27 September 2022), on the Procedure for Managing Waste Generated in Connection with Damage (Destruction) of Buildings and Structures as a Result of Hostilities, Terrorist Acts, Sabotage or Work to Eliminate their Consequences
- The Law of Ukraine on the List of Documents of a Permitting Nature in the Field of Economic Activity
- The Law of Ukraine on Licensing of Certain Types of Economic Activities
- The Law of Ukraine on the Transportation of Dangerous Goods
- CMU Resolution No. 314 (dated 18 March 2022), on Several Issues of Ensuring the Conduct of Economic Activity under Martial Law
- The Law of Ukraine on Environmental Impact Assessment
- The Aviation Rules of Ukraine “Procedure and Conditions for the Air Transportation of Dangerous Cargo”, approved by order 1802 of the State Aviation Service of Ukraine (dated 12 November 2020)
- The Rules for the Transportation of Dangerous Goods (by Rail) approved by order 1430 of the Ministry of Transport and Communications of Ukraine (dated 25 November 2008)
- The Rules for the Transportation of Dangerous Goods by Inland Waterways of Ukraine approved by order 126 of the Ministry of Infrastructure of Ukraine (dated 04 April 2017)

In addition, Ukraine has several international commitments:

- The European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)
- The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)
- The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

For the classification of asbestos-containing debris, the following regulations apply:

- The Law of Ukraine on Waste Management (effective 9 July 2023)
- The Procedure for Waste Classification and the National Waste List, both approved by CMU Resolution No. 1102 (dated 20 October 2023)

I-B. Relevant regulation in Ukraine on ACM

The transportation of hazardous waste is regulated by rules governing the transportation of dangerous cargo, depending on the type of transport. These include:

- The Rules of Road Transportation of Dangerous Goods, approved by order 656 of the Ministry of Internal Affairs of Ukraine (dated 04 October 2018)

- The Law of Ukraine on the Public Health System
- Order No. 1013 of the Ministry of Health of Ukraine (dated 5 June 2023), on State Sanitary Norms and Regulations on Safety and Protection of Workers from the Harmful Effects of Asbestos and Asbestos-Containing Materials and Products
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