CIRCULAR BUILDINGS COALITION

# JUST TRANSITION TO CIRCULAR CONSTRUCTION IN EUROPE

## MEASURES FOR WORKERS

CIRCLE ECONOMY

February 2025

CIRCULAR BUILDINGS COALITION

The Circular Buildings Coalition (CBC) is an initiative by World Green Building Council (WorldGBC), Metabolic, Circle Economy Foundation, World Business Council for Sustainable Development (WBCSD), Ellen McArthur Foundation and Arup to accelerate the transition to a circular economy in the European Built Environment. Supported by Smith Innovation and Laudes Foundation, we bring together stakeholders from the built environment to overcome barriers and embrace sustainable practices. This briefing focuses on labour-related considerations for a just transition as a follow-up to the Circular Buildings Coalition's report Four Circular Building Pathways Towards 2050, which explored how a selection of circular building 'pathways' can contribute to reducing carbon dioxide equivalent ($CO_2e$) emissions and material use in the EU while providing an initial view of their social impacts. This briefing delves into two pathways identified as having high social impacts.

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## Executive summary

As the European Union (EU) stands at the intersection of the climate, housing and cost of living crisis, the transition towards a circular construction industry is a key pillar of future environmental and social sustainability. While circular economy practices offer substantial environmental and economic benefits along with local job-creation, their implementation requires significant adjustments in working conditions and practices. This briefing dives into two of the **circular building pathways** identified as having high social impacts in the Circular Buildings Coaltion's 2024 *Four Pathways Report*: 1) **Build with the Right Materials**; and 2) **Build Nothing**.[1] These pathways are explored alongside their regulatory and market-level drivers, barriers and the measures needed to safeguard workers.

Both pathways impact labour demand, requiring shifts in skills, and attention to training on occupational safety and health (OSH):

- **Build with the Right Materials** increases demand for labour in secondary material sourcing, procurement, urban mining, and quality assurance. It will require new expertise in material recovery, testing, certification, and the use of digital tracking systems. However, integrating secondary materials adds complexity, requiring more handling, quality control, and adaptive construction techniques. The lack of insurance mechanisms for secondary materials and standardised certifications further complicates large-scale adoption, increasing financial and safety risks.
- The **Build Nothing** pathway prioritises renovation, retrofitting, and adaptive reuse of existing buildings, shifting labour demand from traditional construction jobs to tailored and labour-intensive solutions for different public and private building owners. The main impacts are likely to be felt by on-site workers, assessors and evaluators, necessitating upskilling to integrate circularity into existing structures and meet technical demands while addressing the demand for multi-skilled workers. OSH risks, such as exposure to deteriorated structures and hazardous materials alongside outdated safety standards require stronger safety protocols and targeted worker protections.

Several barriers stand in the way of a just transition to circular construction for workers. These include the fragmentation of the industry, weak policy signals, low investment in skills and training infrastructure and the costs of labour-intensive circular economy business models compared to the current cost and risk-profiles of linear approaches.

Several initiatives are already addressing these barriers, as discussed in the case studies within this briefing. These initiatives focus on upskilling vulnerable workers and promoting inclusive training programs to bridge skills gaps. They also highlight the importance of increasing transparency and compliance on construction sites through standardized systems, such as social ID cards. Additionally, best practices in material reuse, including the development of practical guidelines and digital frameworks, are helping overcome challenges related to the recovery and integration of recycled materials. These efforts exemplify how integrated approaches can tackle the existing barriers and pave the way for just transition.

For the construction industry to meet ambitions and fulfil its responsibilities as an employer, measures for safeguarding the rights of workers and creating a level playing field are crucial. This briefing ends with a set of measures that governments, social partners, educators and other European Union (EU), national and local institutions have a role to play in designing and implementing. These include:

- Integration of social standards into EU-wide circular standards and guidelines;
- Social dialogue for just transition planning; and
- Provision and investment in skills and OSH.

# INTRODUCTION

The Circular Buildings Coalition is an initiative formed by Metabolic, Circle Economy, the World Business Council for Sustainable Development, the World Green Building Council, the Ellen MacArthur Foundation, and Arup, supported by Laudes Foundation and coordinated by Smith Innovation, to accelerate the implementation of circular economy solutions. It convenes industry and thought leaders who aim to create a global built environment that operates within planetary boundaries while ensuring a just transition.

This briefing is a follow-up to the Circular Buildings Coalition's report *Four Circular Building Pathways Towards 2050*[2], which explored how a selection of circular building 'pathways' can contribute to reducing carbon dioxide equivalent (CO2e) emissions and material use in the EU, alongside an initial picture of their social impacts. This briefing dives into two of the circular building pathways identified in the *Four Pathways* report as having high social impacts.

It focuses on labour-related considerations for a just transition. It is essential to apply a worker-first perspective in integrating circular economy principles into the construction industry. Without doing so, we cannot be certain that the shift towards more environmentally sustainable practices happens in support of workers and not at the expense of working conditions.[3]

This briefing is designed for social partners––-including trade unions representing workers and sectoral branch organisations representing companies and small and medium enterprises (SMEs)—governments, and other key EU, national and local institutions. It outlines the barriers and measures that need to be considered when these stakeholders are co-designing policies and measures for a just transition for the EU's construction industry. The circular pathways this briefing explores are:

- **Build with the Right Materials:** Develop regulations, certifications and insurance to promote the reuse and recycling of resources.
- **Build Nothing:** Develop and enforce regulations with a primary focus on promoting renovation, retrofitting, and adaptive reuse whenever feasible.

This briefing explores how these pathways will play out in practice for workers at different stages of the value chain. Barriers to achieving them are explored and case studies are provided from initiatives in different EU Member States to gather lessons for the worker-first measures that should be integrated into circular economy efforts. Case studies were identified through desk research and consultation with industry experts. It concludes with measures needed to support workers and thereby create a fair and level playing field as the industry shifts towards material circularity and decarbonisation. The briefing aims to support social partners, governments, and other EU, national and local institutions to design initiatives, policies and transition pathways for the construction industry that safeguard the rights of workers.

## The need for a just transition for circular construction

### An industry at the centre of Europe's green transition

Climate took centre stage in the EU Commission's *Strategic Agenda for 2019–2024*. While climate ambitions, largely in the form of energy efficiency practices, began being translated into targets, national plans, and decarbonisation strategies for the construction industry, cost of living and housing crises swept across Member States during the same period. The construction industry sits at the intersection of these crises: it has the crucial role of ensuring buildings and infrastructure are fit for the future, scaling up infrastructure for the energy transition, and helping to tackle inequalities through access to housing and places where businesses can thrive. Next to this, the construction industry is an important employer. In 2020 it comprised 3.5 million companies and employed around 11 million people in the EU.[4]

### Navigating the circular economy's potential

Circular economy practices can significantly reduce the material footprint by 6.7Gt and carbon footprints by 28% by 2050, as outlined in *Four Circular Building Pathways Towards 2050*. Embracing these practices will have impacts across the industry, with new regulations, services and products impacting how companies and workers operate. It will also call for new roles, skills and supporting measures to manage how these changes will be felt by people working both directly and indirectly in the industry.

Under the Commission's new agenda (2024–2029) there is an opportunity to scale up efforts on circularity in line with climate ambitions and contribute to 'stability, resilience, well-being and equity of our societies and to a flourishing economy'. To maintain momentum for the new agenda, social partners have clarified how ambitions for a circular built environment will play out in practice and how they will benefit workers. This is not only essential for the efficient, cost-effective, and high-quality implementation of circular practices (preventing bottlenecks), but also for social acceptance and social justice (mitigating pushback and workers being left behind). A just transition must be underpinned by social consensus, standards, coherent policies and programmes, and initiatives tailored to the needs of workers across different Member States.[5]

## Drivers of circular construction in Europe

This section explores a selection of drivers that are influencing the rate and speed at which circular economy practices are being taken up within the industry. Circular economy activities are not yet mainstream in the industry, and consequently, labour-related measures are also not yet in place to ensure workers can embrace the transition. Understanding the current regulatory, market-level and geopolitical drivers is necessary to understand the knock-on effects for workers and the measures needed to safeguard them.

### Emerging policy environment

Policies set and implemented at the EU and Member State-level set the industry's direction. *Circular Economy Action Plans* (2015, 2020) and the *European Green Deal* highlight construction as a central industry for achieving the EU's sustainability targets. In line with this, a combination of non-binding guidance and binding directives have been put in place demonstrating steps towards an enabling policy environment for circular construction.

The 2008 Construction and Demolition Waste Directive has been an important mechanism for promoting sustainable practices, with the aim of increasing the reuse of construction and demolition waste to 70% by 2020.[6] However, while it has been successful

in driving collection and sorting, it falls short at supporting high-value recycling practices over downcycling. [7] The European Commission provides guidance on Circular Public Procurement (CPP)[8] in the broader context of Green Public Procurement (GPP). The guidance encourages governments and businesses to prioritise circular approaches when awarding contracts, driving demand for sustainable construction practices, such as the renovation or use of more secondary materials in public buildings. Such guides should also create demand for the skills required to implement these strategies and provide technical support for stakeholders, such as those at the city level, to ensure they have the knowledge of circularity needed to put the guidelines into practice.[9] [10]

The Construction Transition Pathway, developed under the EU Industrial Strategy and published in March 2023, outlines key priorities for guiding the construction industry through the green and digital transformations.[11] It focuses on competitiveness, innovation, skills development, and sustainability, emphasising the actions needed to address various challenges, including SMEs' participation and how to foster high-value recycling and resource efficiency. These pathways provide a framework for collaboration across stakeholders, aligning with EU goals for circularity and resilience in the built environment.

Despite not containing specific or binding circular requirements, the increasing wave of energy efficiency policies and directives is increasing demand for more sustainable building solutions, such as through the Energy Performance for Buildings Directive (EPBD). The EPBD is predicted to create over 160,000 new jobs by 2030 through energy efficiency initiatives alone.[12] However, broader projections suggest that between 486,600 and 1.5 million additional workers may be needed to meet the demands of building construction and energy renovations.[13] The development of National Building Renovation Plans (NBRP) provides an opportunity for Member States to include measures tailored to the needs of their workforce and labour market as part of the implementation of the EPBD.

Likewise, the EU Green Taxonomy provides definitions of economic activities that can be considered environmentally sustainable and includes circular economy as one of its main objectives. It thereby provides a mechanism for increasing taxonomy-aligned investment in circular economy projects and associated skills and infrastructure development. Such taxonomies also require supporting policy and regulatory environments to financially incentivise companies to adopt circular activities.[14] Some have called for a European Social Taxonomy to increase transparency and accountability regarding the social impact of business activities.[15]

## Material shortages and supply chain disruptions

The construction industry includes extended linear supply chains, leaving it exposed to supply chain disruptions and associated increases in material input costs resulting from external shocks like the covid-19 pandemic and inter-country conflicts. In the context of these price hikes and supply-chain disruptions, 23% of EU construction companies reported production issues in August 2022 due to a shortage of building materials.[16] As carbon taxes continue to be applied to encourage polluting industries to reduce their emissions and energy prices remain high,[17] there is a growing case for the industry to invest in industrial symbiosis and circular solutions. These approaches help shorten supply chains within subregions and extend the use of materials, reducing costs and minimising exposure to global volatility.

## Digitalisation

Digitalisation is accelerating the transformation of the EU construction industry, driving it towards more sustainable and circular practices.[18] Technologies like Building Information Modelling (BIM), digital twins and Internet of Things (IoT) systems enable circular design strategies, the precise tracking of materials, resource optimisation, and waste reduction, supporting circular economy goals throughout the construction lifecycle. Furthermore, digital tools streamline project planning, reduce construction time, and minimise environmental impacts, whilst increasing the visibility and protection of workers through measures such as social ID cards (see case study three). Artificial intelligence is being increasingly used to optimise end-of-life scenarios, for example, by enabling waste sorting, automating material recovery with robotics, and streamlining reuse and recycling supply chain processes. As these technologies are integrated into new construction projects, they are reshaping the industry's skill requirements, with an increasing focus on digital expertise, data analytics, and circular design approaches. The New European Bauhaus initiative is connecting sustainability with circularity and innovation, encouraging upskilling programmes to equip the workforce with the digital expertise needed to meet Europe's sustainability and circular economy goals.[19]

## Frontrunning companies and cities

Frontrunners are important drivers of circular construction. Large construction firms with close relationships with their local and national government are well-positioned to take on innovative circular projects, as they are also often the main contractors or service providers. As such they can—and should—support the SMEs or labour suppliers that they collaborate with as subcontractors by facilitating access to the infrastructure, subsidies and training needed to scale new circular solutions. For example, in Denmark, the Climate Partnership for Construction,[20] initiated by the Danish government, brings together stakeholders from the private sector, to implement circular principles in construction. Similarly, in the Netherlands, 250 industry frontrunners have come together to form the Cirkelstad,[21] leading to Het Nieuwe Normaal (HNN), a widely supported standardised language aimed at making circular construction the norm. In France, Circolab[22] unites private firms, with government bodies to advance circular construction. Some cities are also taking the lead on circular construction, such as through the Circular Cities Declaration (CCD). Signed by over 40 European cities and regions, the declaration underscores the importance of integrating workforce considerations by engaging local stakeholders, enhancing education and training opportunities, and equipping the workforce with the skills needed for long-term sustainability.

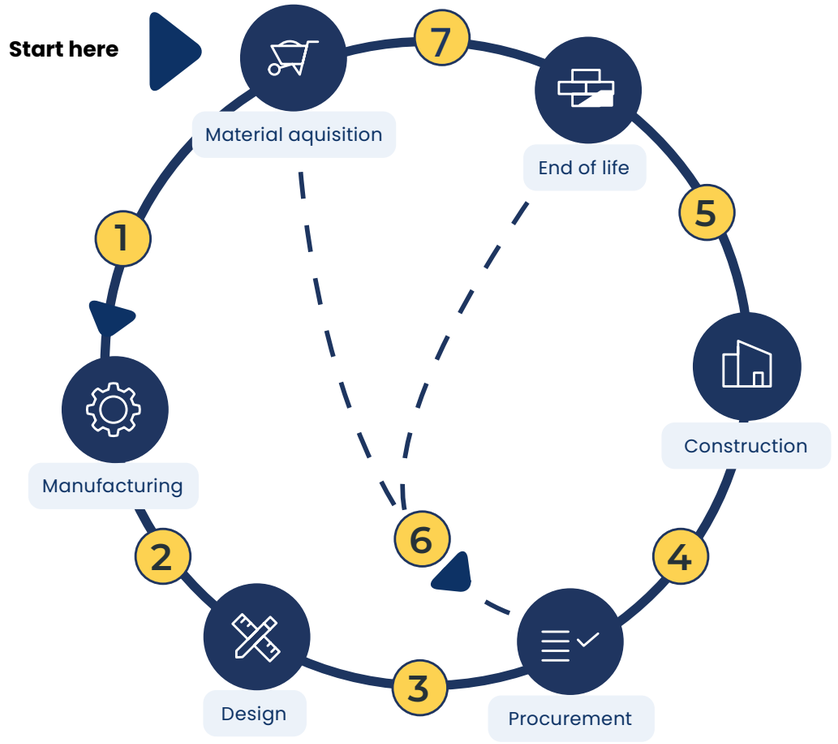
# TWO PATHWAYS TOWARDS CIRCULAR CONSTRUCTION

This section zooms into two pathways for achieving circular construction in Europe and outlines how these changes at scale would play out for workers at different stages of the value chain. It examines associated job roles, skills and OSH. These insights are based on a combination of desk research and consultation with industry experts, including social partners.

## Build with the Right Materials

**Build with the Right Materials** uses regulations, certifications, insurance and material management systems to promote reuse and recycling of resources. In this pathway, the careful selection and use of materials that align with circular principles reduces the use of virgin materials, carbon-intensive materials, and hazardous/polluting materials. It reduces dependence on virgin materials by prioritising reuse, such as recycled concrete, steel, and aluminium. The type and quantity of materials used by the construction industry varies by region, with Western European building typologies typically using more materials by weight per square metre of gross floor area, often due to greater use of concrete.[23] Consequently, regionally typical building typologies will influence the type and degree to which secondary materials can be integrated into buildings by workers across different regions.

**Figure one** illustrates the shifts in the value chain associated with the 'Build with Right Materials' pathway.




1
**Shift towards recycling practices**
With a gradual transition away from primary materials, such as steel and concrete, to refurbishing or remanufacturing secondary materials.

2
**Circular products demand and requirements**
Increase in demand of practices to assure the quality and environmental impact of products sourced from reused and recycled materials. But this will still be dependent on the products available on the market.

3
**Adequate infrastructure for circular materials**
Demand for knowledge about circular practices, digital and BIM modeling, and logistics to acquire recycled material (storage and timing).

4
**Acquisition of circular materials**
More careful inspection of material availability and feasibility for construction projects.

5
**Shift in jobs**
Fewer jobs due to the shift from onsite construction to prefabrication, but more opportunities in demounting and installing secondary components.

6
**Collaborative efforts across the value chain**
Logistics required to better coordinate the materials from a building donor for direct reuse.

7
**Prioritization of material recovery**
Industry shifts from demolition to deconstruction to recover more materials. Increase in recovery of materials for recycling.

## Labour impacts snapshot

The **Build with the Right Materials** pathway increases demand for labour at multiple stages of the value chain, visualised in Figure one, due to the labour intensity of the processes involved in material management, mining, sourcing, and production. Scaling this pathway is anticipated to increase demand for some existing occupations and require shifts in task reorientation and upskilling for others. New roles related to assessment, quality assurance, storage and tracking, and insurance are likely to emerge where specific skills and knowledge are required to reduce environmental impacts while maintaining material quality and safety standards. Scaling this pathway would create demand for skilled labour at different nodes of the value chain, from procurement to the demounting and recycling of materials. However, clear and binding targets will be needed to provide the financial incentives and level playing field needed for this pathway to achieve the scale it needs to translate into benefits for workers.

Building with secondary materials will change the way people work across the value chain, as reflected by Figure one and expanded on in Table one.

- As **material acquisition** shifts to integrating secondary materials, demand for primary materials and jobs in resource extraction would decrease. Simultaneously, local sourcing strategies may gain prominence as materials are increasingly cycled within Europe, emphasising regional labour for sourcing and transportation between facilities acting as circular material hubs.
- At the **manufacturing stage**, technologies like 3D printing for recycled concrete and prefabrication enable the use of secondary materials, shifting work to factory settings. While industrialisation typically reduces on-site labour, the use of recycled or reused materials may increase complexity, requiring more hands-on adjustments and craftsmanship at the site. Material testing and quality control will be increasingly carried out in factory settings, requiring new skills to maintain consistent product quality and reduce risks associated with recycled materials.
- At the **design stage,** there will be an emphasis on disassembly techniques, such as using screws instead of welding for easier material reuse. Designs also need to be more flexible, adapting to the availability of secondary materials, and closely linked to procurement. This shift will influence skills on-site, as workers will need to adapt to new methods of deconstruction and modular component handling.
- At the **procurement stage,** Material Scouts and Procurement Specialists will be required to navigate complex circularity standards and evaluate high-quality secondary materials and reusable building components from the donor building. Lacking insurance for recycled materials adds risk to these processes, however.
- In **construction**, workers will face new requirements for using pre-fabricated components made from secondary materials, which will require retraining in modular construction methods. While off-site industrialisation may reduce some on-site labor, the rise in material reuse and recycling could increase on-site work due to the need for custom adjustments and the handling of non-standardised materials.
- At the **end-of-life stage**, there will be an increasing demand for labour for disassembling structures, and to recover, transport and store materials efficiently at circular material hubs. These activities will require collaboration with companies working to reintegrate secondary materials into the value chain.

**Table one** lists examples of the roles and skills that are likely to shift across the value chain from **Building with the Right Materials**.

| Stages of the value chain | Associated roles | Skills |
|---|---|---|
| Material acquisition | Material Scouts, Procurement Specialists, Supply Chain Managers, Circular Economy Consultants | Assessing recycled and bio-based material quality, knowledge of low-impact materials (recycled), sustainable procurement, and supplier evaluation for compliance with circular economy standards. |
| Manufacturing | Procurement Specialists, Insurers, Production Engineers, Quality Assurance Specialists, Circular Material Scientists | Expertise in recycled material processing, and verifying safety and durability for quality assurance. |
| Design | Architects, Sustainability/Environmental Consultants, Structural Engineers, Compliance Officers, Project Managers, Lifecycle Analysts, Product Developers | Experience in design for recyclability and reuse, design for disassembly, life cycle analysis, circular material certification, and regulations regarding material use (for example, understanding of the impacts of recycling concrete), and high material efficiency. |
| Procurement | Procurement Specialists, Supply Chain Managers, Transportation Workers, Reverse Logistics Specialists, Warehouse Operatives, Wholesalers | Expertise in evaluating recycled materials, assessing compliance with circularity standards, optimising logistics for sourcing recycled materials from donor assets (also in relation to transport and storage), contract adaptation for circular services, and risk management. |
| Construction | On-site Construction Workers, Site Managers, Foremen, Logistics Managers. | Integrating pre-fabricated components made from recycled material, working with non-standard materials, modular construction, collaboration and communication with manufacturers/suppliers, increased adaptability on site, and reducing construction waste. |
| End-of-life | Waste Management Specialists, Material Recovery Technicians, Recyclers, Demounting Specialists, Urban Miners, Demolition Workers, Deconstruction Contractors | Ability to safely and effectively disassemble structures, minimising damage and contamination to maximise material value, collaboration with circular material hubs and post-processing facilities, and ensuring compliance with quality and safety standards. |

Case study 1

### BauKarussell work integration social enterprise in Austria

Work integration social enterprises have a strong commitment to the inclusive reskilling and upskilling of vulnerable individuals and can also play an important role in providing and adapting training and attracting new entrants into circular construction.[24]

Since 2017, the BauKarussell project consortium in Austria has had a dual focus, combining the collection of building components and waste materials from construction sites for reuse or recycling with the creation of job opportunities for disadvantaged individuals. Training, skills certification, and work integration placements are provided through local social enterprises, empowering unemployed individuals to acquire the necessary qualifications and certifications to find employment in the industry. This process is underpinned by compliance with the Recycling Buildings Materials Ordinance, and undertaken by authorised specialist disposal companies, safeguarding OSH.[25]

To date, BauKarussell has generated 37,000 hours of socioeconomic employment—whereby money generated through sales flows back into the economy to fund eduction and training—and developed a cooperative integrated by various stakeholders in the social economy and circular construction industry (including Österreichische Gesellschaft für Nachhaltiges Bauen, Pulswerk GmbH, Job-TransFair gGmbH, Die Wiener Volkshochschulen, Re-Use Austria, Hilfeeinrichtung der Caritas der Erzdiözese Wien, and more).[26]

The programme emphasises the skills that urban miners need to inspect and evaluate the condition of building components, including proficiency and knowledge on different products and materials, their features, and their potential for reuse or recycling. The programmes focuses on building critical skills, including:

- Identification and first quality check;
- Understanding of safe deconstruction and demolition practices;
- Knowledge of building construction materials and components; and
- Knowledge of other construction techniques.[27]

Initiatives such as BauKarussell illustrate the job opportunities emerging at the end-of-life stage of the construction value chain, while also highlighting the dependence of these opportunities on an effective supply of labour and workforce integration. The example of the BauKarrussell shows how the challenges of the **Build with the Right Materials** pathway—such as labour shortages, skills gaps, and the need for effective material recovery—can be addressed through approaches that prioritise inclusivity and workforce development.

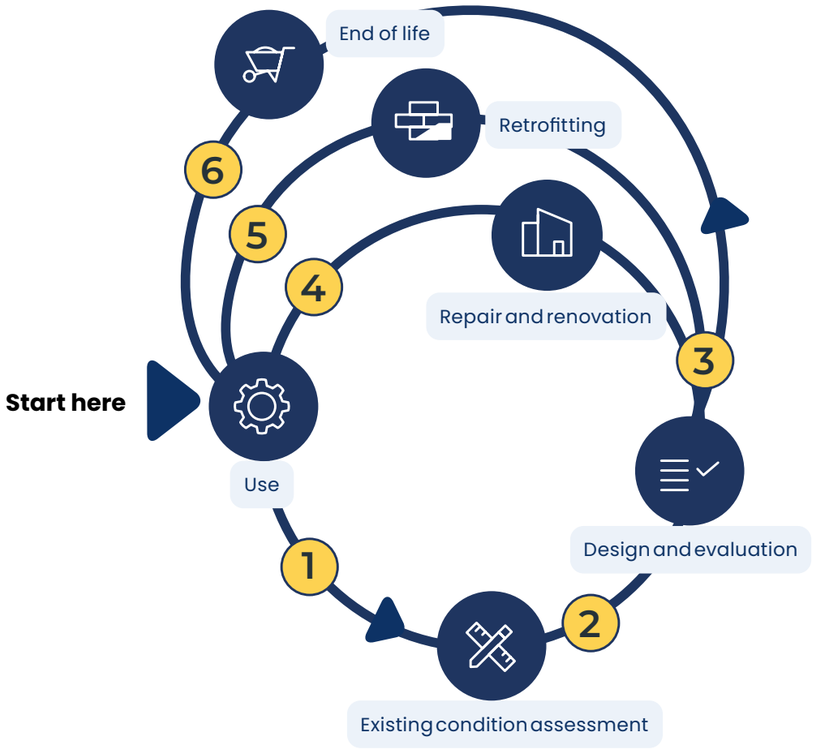
## Build Nothing

**Build Nothing** promotes renovation, retrofitting and adaptive reuse whenever feasible. With 85 to 95% of the EU's current building stock expected to still be in use in 2050, this pathway centres on extending the lifespan of existing buildings, thereby reducing materials used for new construction.[28] However, the type and quantity of building stock required differ by region in line with socioeconomic needs and demographics. The drive for renovation is also directly linked to ownership. For example, government and other public buildings offer an opportunity to scale up renovation, while renovation of private buildings and homes will be harder to scale. Scale is an important factor for the labour market, as it is needed to give a strong signal to the industry and incentivise companies and governments to invest in the right training, infrastructure, and equipment.

## Labour impacts snapshot

Promoting renovation requires that tailored solutions are developed for different public and private building owners. This pathway is expected to be characterised by a significant shift in the skills and tasks performed by the majority of current construction companies and workers in order to integrate circularity into existing energy efficiency projects. The main impacts are likely to be felt by on-site workers, assessors, and evaluators, as they will be required to move away from new building projects and towards tailored projects that extend the lifetime of existing buildings through repair and renovation, retrofitting, and to a lesser extent, recycling. Large-scale upskilling will also be needed to meet the technical demands of renovating buildings using circular materials such as reclaimed wood or circular facade systems, including efforts to reach vulnerable Intra-EU labour migrants with upskilling. These shifts are visualised in Figure two. Specialised skills required for retrofitting and adaptive reuse are currently scarce, and selective disassembly is labour-intensive, placing strain on the existing workforce. Additionally, processes that are labour-intensive, such as retrofitting, struggle with worker shortages in advanced techniques such as prefabrication or installation smart building systems, coordination challenges among traders, and the technical demands of renewable energy integration.[29]

**Figure two** illustrates the shifts in the value chain associated with the 'Build Nothing' pathway.




1

**Use of existing structures**
Shift from working on new construction to renovation, retrofitting, repair, and maintenance of existing structures.

2

**Audits, impact assessment, and regulatory changes**
Required changes in frameworks delimiting possibilities for current structures. Increase in demand for roles contributing to this assessment.

3

**Changes in design practices**
Shift towards renovation, repurposing, and retrofitting.

4

**Skills shift**
Demand for specialized skills in energy-efficient renovations, repairing, and maintenance.

5

**Skills shift**
Demand for specialized skills in retrofitting techniques and extending the durability of buildings.

6

**Skills shift**
Demand for demounting and installing skills, especially in reshoring systems.



Promoting renovation and retrofitting will change the way people work across the value chain, as reflected in Figure two and expanded on in Table two.

- Jobs in **construction** will have to undergo a significant transformation in terms of tasks and skills as workers shift from working on new construction to preserving existing structures and implementing modern energy systems as part of **renovation, retrofitting, repair and maintenance** projects. The use of social ID cards should come hand in hand with circular practices and social standards, alongside digitalisation, which will support greater worker visibility.
- **Assessment and evaluation of existing structures** will increase as decisions to renovate, retrofit, repair or even deconstruct will need to be made based on structures' condition and life cycle assessments
- **Design and evaluation** will shift from a focus on new buildings to modular, adaptive principles for renovation and retrofitting, calling for Architects and Designers to use life cycle assessments, circularity indices and material passports to extend building lifespans and enable future disassembly.
- Where some buildings reach **end-of-life** and need to be decommissioned, there will be a similar demand for labour for demounting and urban mining activities for selective disassembly and material recovery. As seen in the previous pathway, this will also call for the establishment and management of facilities that can act as circular material hubs.

**Table two** lists examples of how roles and skills are likely to shift across the value chain from **Build Nothing**.

| Stage of the value chain | Associated roles | Skills |
|---|---|---|
| Design | Architects, Interior Designers, Retrofit Designers, Sustainability Consultants, Material Engineers | Advanced knowledge of design for disassembly (DfD), modular and adaptive reuse strategies, and integrating circular practices into building systems. |
| Assessment and evaluation | Building Surveyors, Evaluators, Circular Consultants, Compliance Officers, Energy Consultants | Expertise in structural integrity evaluation, life-cycle assessment (LCA), and compliance with circular building codes. Proficiency in digital tools for circular assessments. |
| Repair and Renovation | Skilled Traders (for example, Electricians, Plumbers), Energy Efficiency Technicians | Technical skills in energy-efficient renovations, and repairing and upgrading existing building systems. |
| Retrofitting | Construction Workers, Retrofitting Engineers, Site Supervisors | Knowledge of retrofitting techniques to enhance building durability. |
| End-of-life | Demounting Specialists, Deconstruction Technicians, Urban Miners | Skills in the safe and effective disassembly of structures to recover materials for reuse, collaboration with circular material hubs for post-processing and redistribution, and proficiency in logistics for transporting recovered materials and managing their reintegration into the circular value chain. |

Case study 2

**Upskilling the demand and supply side of circular construction in Bulgaria, Croatia, Czechia, Hungry, Ireland, the Netherlands and Spain (BUS-GoCircular)**

To address the dual challenges of stimulating demand for circular construction skills within renovation and building the required hands-on capacity, the BUS-GoCircular project was set up as a follow up to the BUILD UP skill initiative as a 30-month project running from 2021 to 2023. The project aimed to create impact at two levels:

- On the supply side: Empower workers across the value chain with the right set of skills for the transition, through the analysis of required skills, qualification frameworks for circular construction, and the creation of training programmes.
- On the demand side: Foster demand for skilled workers by providing public authorities with tools to boost demand for these professions.[39]
- Delivered across seven countries (the Netherlands, Bulgaria, Czechia, Spain, Hungry, Croatia, and Ireland) the project produced a range of tools aimed at promoting supply- and demand-side outcomes related to circular renovation, including:
- Qualification frameworks: Skills need analysis for key professions including architects, financial managers, building owners and data analysts, a comprehensive task-based qualification framework for circular strategies in construction, and application of the framework to multifunctional green roofs, façades, and interior elements.
- Training materials: Train the Trainers' programme guide and mentorship programme, including digital and e-learning platforms, and national and EU training packs.
- Resources for market stimulation: An action plan for public authorities, guidance on skill recognition methods and training on procuring circular construction skills.[40]
- The integration of circularity into Vocational Education and Training (VET): An advisory document was published to develop specific learning targets and curricula to be implemented locally.[41] This supported the integration of circularity into the Dutch VET system, guided by the Foundation for Cooperation on Vocational Education, Training and the Labour Market (SBB).

The project exemplifies an initiative focused on the implementation of interventions to adopt circular practices with a focus on workers' capacity development that promotes life-long learning and the creation of pools of skilled workers with support of social partners.[42]

**OSH Considerations for Build with the Right Materials and Build Nothing:**

- OSH measures and training related to the handling of hazardous materials, such as airborne asbestos, synthetic mineral fibers, and polychlorinated biphenyls (PCBs) are important for worker safety in relation to both pathways to prevent long-term health consequences.[30] [31] Circular strategies that prioritize the use of non-toxic, reusable and sustainable materials reduces the risks of exposure to such substances.
- Retrieving components and materials during the deconstruction of older buildings could expose workers to hazardous materials. These risks are heightened when these materials are recycled with the intention of reuse.[32]
- On the other hand, circular design approaches such as design for disassembly, modular construction, and digital tracking of material health provides an opportunity to reduce such risks for new constructions.
- Renovation of older buildings can also pose safety risks due to structural deterioration, outdated safety standards, weakened foundations, or degraded materials.[34] [35]
- Injury and illness are also a risk within material recovery facilities (MRFs) and should be mitigated with training, proper material handling equipment, and equipment-based ergonomics interventions.[37]
- Innovations to facilitate safe recovery of materials, such as robotic sorting, automatic, and ergonomically designed handling processes, can reduce the risk of injuries and long-term impacts.

A comprehensive approach to OSH developed in collaboration with sectoral social partners on the EU and national level is essential. This should include the incorporation of standardised deconstruction protocols, robust risk assessments, quality assurance and control, and targeted OSH training programmes. Strengthening regulatory compliance and promoting awareness of OSH hazards is also critical for safeguarding workers engaged in circular renovation and deconstruction activities.[38]

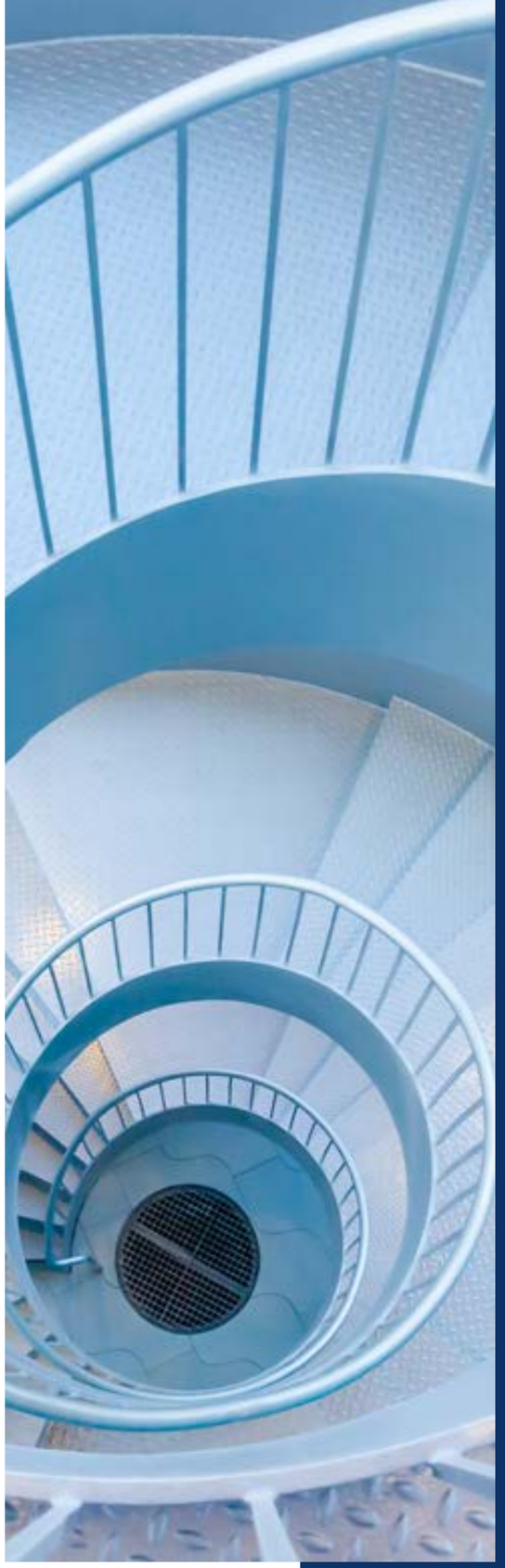
Whilst the activities and skills utilised in the two pathways differ, their risk-profiles are comparable. Both call for capacity development regarding technical skills and OSH issues alongside measures that can address other widespread issues currently creating barriers to safe work in the industry. The following section outlines some of these key barriers to a just transition for workers. Measures for addressing these barriers and promoting safe and fair work in the circular economy are then given in the final section of this briefing.

# BARRIERS TO A JUST TRANSITION

## Industry fragmentation

The EU construction industry is a major employer, characterised by a high degree of business atomisation, transnationalisation and a mobile, intra-EU workforce. The average construction enterprise employs 3.1 million people.[43] Cross-border movement of workers is common and workers are typically assigned to projects via postings through long chains of subcontracting facilitated by temporary employment agencies. These subcontracting chains increase exposure and sensitivity to external shocks, price competition and, of particular interest to this briefing, challenges with enforcing labour standards.[44] This includes enforcing basic terms and conditions, and health and safety on site, as responsibility is often passed on to the next link in the chain and there is typically little transparency on construction sites.[45] [46] This lack of transparency can exacerbate challenges, leaving workers vulnerable to labour standard violations and precarity.[47] [48]

Although some workers in the industry benefit from this mobility, the industry's overall fragmentation has contributed to an image that is not always sustainable and/or attractive to younger generations. Whilst creating a sustainable image of the industry through circular approaches and increasing industrialisation may help to increase its attractiveness, fragmented supply chains combined with the complexity of circular approaches may lead to delays, increasing project costs, reducing efficiency and reducing risk appetite in the industry.[49] In the following section, we outline the importance of policy in reducing complexity and integrating social standards into circularity measures.





Case study 3

### Using social ID cards to increase transparency and compliance on construction sites (EU and Belgium)

As the industry continues to diversify and expand, the need for standardised processes and compliance increases.[50] Social ID schemes have been put in place by different Member States to tackle issues related to industry fragmentation, such as undisclosed work, social dumping, skills, fraud and adherence to social agreements. In some Member States this is taking place on a voluntary basis, while others have set a legal basis.[51] In the context of the circular economy, Social ID cards play a crucial role in ensuring fair labor practices, improving occupational safety and health (OSH), and enhancing supply chain transparency. By certifying worker training and qualifications, these schemes help ensure that only properly trained personnel handle hazardous materials, reducing OSH risks associated with material recovery and reuse. Additionally, Social ID systems can support workforce mobility and upskilling, helping workers transition to new roles that require specialized circular economy skills, such as deconstruction and prefabrication.

The Social Identity Cards in Construction (SIDE-CIC) project was established by European social partners, the European Federation of Building and Woodworkers (EFBWW) and the European Construction Industry Federation (FIEC) to map the use of ID cards in the construction industry across Member States and explore the technical and legal feasibility of connecting existing national social ID card schemes. Between 2023 and 2025, the project will explore how ID cards can tackle standardisation challenges and help shape a more inclusive and regulated construction industry.[52] The project's primary objectives are to:

- Guarantee the enforcement of EU rules on construction sites;
- Develop a more transparent environment for workers, employers, and labour authorities; and
- Foster fairer labour mobility in the construction industry.

Belgium's ConstruBadge, for example, was first introduced in 2014 and evolved from earlier initiatives addressing undeclared work and social fraud. The ConstruBadge is a visual ID tool used for real-time identification to combat social fraud, especially on multi-employer worksites.[53] The badge includes information about the worker linked to a central database, allowing for the verification of employment status and compliance with labour laws. The scheme aims to increase transparency in the work environment, reduce risks associated with undocumented labour, and enhance accountability for contractors and subcontractors. It also aims to foster the enforcement of labour regulation compliance, including tax and social security contributions, and facilitate better site management to enhance safety protocols and emergency response measures.[54]

Case study 4

## The Interreg NWE-project: Facilitating the Circulation of Reclaimed Building Elements (FCRBE)

Only 1% of building elements are reused in North-Western Europe after their first application, often due to a lack of structured efforts and approaches for integrated reuse strategies into more standardised contemporary building practices.[57] To respond to challenges relating to standardisation, the FCRBE project was implemented between 2018 and 2023.[58]

The project aimed to achieve a 50% increase in volumes of reclaimed building elements in circulation across the northern regions of France, Belgium, and the UK by 2032.[59] To achieve this, the project provided practical guidance on reuse and space to standardise methods for quality assurance and procurement strategies for recycled materials. In turn, this helped enhance technical capabilities among procurement specialists, policymakers, and project managers involved in the assessment of secondary materials and related contracting processes. This was approached through a number of actions:

- **Development of reuse toolkits and guidelines for workers:** The documents developed included tools and methods for contracting authorities, building developers, architects, procurement officers and other building professionals to implement reuse actions and good construction practices. This was supported by resources for reuse, such as booklets and roadmaps. In addition, several digital frameworks were created to help and foster reuse practices for reporting and digital deconstruction.[60] These resources provide practical advice on procurement strategies, quality assessment, and environmental impact considerations
- **Practical guidelines for specialist trades:** In consultation with trade associations, six guides on reuse were developed for specialised trades such as general contractors, finishing companies, woodworkers, roofers, demolishers, and infrastructure contractors. These guides allowed for tailored safety protocols and best practices specific to each trade, ensuring safer working conditions.
- **Improved communication on deconstruction projects:** The tools developed in this project have been tested and promoted in 37 pilot operations throughout various large (de)construction projects, aiming to promote effective communication efforts and the smooth integration of these outputs into field practices and policies.[61] These pilots serve as practical examples, showcasing how reclaimed materials can be effectively utilised, thus encouraging wider adoption within the industry.
- **Promotion of standardisation and alignment of policy frameworks:** Emphasising the critical role that policymakers play in shaping and standardising practices, FCRBE addressed the required adaptation to fiscal policies, harmonised reuse targets in public procurement, and standardised frameworks for assessing material suitability and environmental benefits.[62] [63]

By aligning stakeholders, addressing regulatory challenges and developing capacity-building tools, the project underscores that overcoming barriers to secondary material use in mainstream construction practices requires an integrated and standardised approach.

Case study 5

## Dublin City Council's Bedsit Amalgamation Programme

Dublin City Council's Bedsit Amalgamation Programme focuses on the refurbishment and amalgamation of apartments built in the 60s and 70s. They aim to bring them up to appropriate standards and improve their energy efficiency so that they become comfortable and affordable homes for senior citizens. Across Dublin, over 280 bedsits have been reconfigured into 140 modern one-bedroom apartments.[70] As part of this programme, 35 apartments were renovated at St. Birkin's Park with key Nearly Zero Energy Buildings (nZEB) features, making them compliant with EnerPHit standards for Quality-Approved Energy Retrofit with Passive House components.

These actions required a labour-intensive approach, presenting unique opportunities and challenges for the workforce. To address this, the Dublin City Council included training prerequisites in their tender criteria to stimulate demand for the required knowledge and skills. The contract included a clause on the requirement of competition of the Passive House Tradesperson's training programme, which was funded by the Dublin City Council and delivered via five sessions combining theory and practice. As a result, between ten and 12 personnel received specialised training, and were equipped with essential skills for energy-efficient retrofits, including insulation installation, airtight construction, and mechanical ventilation system implementation.[71]

The training was seen as a key marker of the programme and EnerPHit certification's effectiveness. This project further stimulated the demand of nZEB skills and knowledge, and the success of the project and the effective certification of later on. By embedding training and funding for this training into the procurement processes, Dublin was able to streamline its nZEB ambitions and provided a model for how to promote circular solutions while overcoming bottlenecks in labour and funding.

## Weak policy signals

Despite positive developments in circular economy policies at the EU level and the growing number of binding energy efficiency targets, binding circularity targets are lacking. This results in weak policy signals, hampering labour market transformation in an already fragmented industry. Circular and social procurement guidelines are, for example, currently non-binding, meaning that stakeholders in the public sector under pressure to minimise costs may still be discouraged from procuring circular projects, as they may be deemed expensive or risky. This has a knock-on effect on labour and skills gaps, as well as social standards: without clear incentives from the public sector that investing in skills development and social standards will pay off through procurement contracts, companies are unlikely to embrace these investments. The 2014 Public Procurement Directive is likely to be addressed by the new Commission. This follows evaluations showing that despite ambitions for procurement in the EU to be social, innovative and green, many of these targets were not met due to a lack of binding clauses and legal uncertainty.[55] Current policy frameworks often lack adaptability, focusing on technical specifications instead of performance-based outcomes. This limits innovation and social progress and creates inefficiencies in material reuse. Despite efforts to promote recycling, existing frameworks fall short of encouraging high-value recycling, favouring downcycling instead. This undermines the economic and environmental potential of secondary materials.[56]

## Costs and risks associated with circular practices

A study in the Netherlands estimated that circular construction projects require additional investment costs of 1.7 to 7% compared to linear methods of construction and demolition.[64] Given that the processes and materials used by the construction industry are strongly driven by costs, real and perceived costs and risks are a major barrier to scaling construction projects and the required investment in the workforce. Several factors currently influence the cost performance of circular construction projects, particularly within the end-of-life, production, design and planning, and construction phases:

- Circular construction approaches are time and labour-intensive, presenting a larger challenge for Member States with higher labour costs.[65] [66] The use of secondary materials, for example, is associated with additional expertise required to store, process and ensure quality or modify the materials to fit design specifications. The complexity of deconstructing rather than demolishing buildings also requires expertise.[67]
- The lower environmental impact, and therefore real costs, of circular construction are currently not reflected in subsidies and cost structures. At the same time, the embodied carbon and associated costs of extracting, producing, and transporting buildings products and materials are not taken into account in current pricing mechanisms.
- Risk models used by lenders largely do not account for risks associated with raw material use, such as resource scarcity and the impact of geopolitics or climate change on access to raw materials. Using secondary materials can help mitigate these risks.[68]
- Circular products, such as those made from secondary materials, are not currently easily insured in Europe.

As a result the labour required to engage in time-intensive circular approaches is often seen as greater than the cost of procuring less sustainable approaches or products.[69] In an industry that works to drive costs down, the squeezing of labour costs limits market demand for circular skills.

## Skills gaps and training infrastructure

Skills are an important factor for labour supply and promoting innovation, alongside other factors such as wages, working conditions, performance of the economy and geographic differences in infrastructure and digitalisation.[72] Targeted skills pathways are needed to ensure that the integration of labour-intensive processes into existing workflows do not add strain to traditional roles or exacerbate existing labour shortages. Leveraging the employment opportunities associated with circular strategies must therefore come hand-in-hand with investment in skills alongside investment to cover the substantial costs of scaling up recycling technologies, logistics, material processing, and reintegrating recovered materials into the built environment. A targeted approach, set at the EU level and implemented by Member States, is particularly important given the cost factors and industry fragmentation discussed above. The construction industry often struggles to upskill, develop and increasingly attract its workforce.

As demand for training and education on circular approaches is largely driven by market demand for sustainable buildings, large companies, Member State governments and national sectoral social partners have an important role to play in both developing the workforce and stimulating demand for circular skills. Public-private partnerships are key for establishing training and education programmes that can drive circular construction, with sectoral social partners ensuring the needs of SMEs at the table. VET and other training schemes, supported by social partners, should also be strengthened. Establishing such training requires collaboration on two fronts: firstly, to review the current state of skills and qualifications available in large companies', Member State governments', and national sectoral social partners' local industry, as well as outlining which ones are increasingly necessary as circular approaches are introduced into projects. Secondly, these entities must work with VET institutions to evaluate current training provisions and develop relevant certifications needed to upskill the current and future workforce, and ensure subsidies are available to fund the required training. Collaboration with TVET will be particularly important for renovation and retrofitting in order to support companies and workers that have been trained and encouraged to perform increasingly segmented, focused and automated tasks, in shifting back to more varied tasks and multi-skilled forms of craftsmanship.[73]

Case study 6

### DRIVE 0 promoting circular renovation in Italy, Estonia, and Slovenia

The Drive 0 project focuses on circular renovation based on 100% renewable energy and the use of both technical and biological materials, alongside integrated efforts to minimise losses in performance quality. The project worked to create local employment opportunities in modular construction and circular renovation practices and promote upskilling.[74] Participants involved in the Drive 0 pilots received training to implement modular construction and prefabricated solutions, and were supported in developing the knowledge and skills needed to reduce construction times and minimise material waste.[75] The training was centred around local projects fostering effective renovation practices:

- Case 4 - **Villa within the new 'Borgo Digani' building complex, Argelato, Bologna**: The project focused on renovation of typical rural architectural villa buildings in Bologna. The case achieved the implementation of circular renovation, based on the concept of urban mining and locally reused and recycled materials, alongside detailed life cycle analysis and life cycle costing to understand the environmental and economic implications of the strategy.
- Case 5 - **Apartment buildings, Saue, Estonia**: The project implemented deep energy retrofits to address Estonia's pressing challenge of outdated residential buildings. This intervention used prefabricated panels made from locally reused and recycled materials and bio-based components, minimising environmental impacts and reducing on-site construction time.
- Case 6 - **Deep circular energy retrofits in Slovenia**: This pilot addressed the inefficiencies of older, thermally inefficient houses by carrying out circular deep energy retrofits on three single-family houses. The project used recyclable mineral wool insulation and prefabricated panels, which shortened installation times and reduced construction waste.

By promoting modular construction techniques and enhancing skills in renewable material integration, the project directly addresses skill shortages, a critical labour challenge in the **Build Nothing** pathway. This demonstrates how labour shortages can be effectively tackled by building local capacity, promoting community engagement, and providing training sessions.

# MEASURES TO SAFEGUARD WORKERS AND ENSURE A JUST TRANSITION

The construction industry stands at the juncture of multiple transitions, setting high expectations for its role in navigating them and the environmental and socioeconomic crises that underpin them. Measures that safeguard workers' rights and create a level playing field will be crucial for the industry to meet circular economy goals and fulfil its responsibilities as a major employer. Sectoral social partners—representing both workers and companies via branch organisations—governments, educators and other EU, local and national authorities all have a role to play.[76] Whilst the circular activities and skills utilised in the two pathways **Build with the Right Materials** and **Build Nothing** differ, their risk profiles are comparable and as such require similar measures that must be adapted and applied to workers at the different stages of the value chain where risks are most likely to be felt. The measures outlined in Table three set out particular priorities for stakeholders that should work together to promote a more socially just and circular construction industry.

**Table three** explores measures for a just transition and lists relevant stakeholders.

| Measures for a just transition | | Lead stakeholders |
|---|---|---|
| 1. Integration of social standards into EU-wide circular standards and guidelines | • **EU Commission and Member State Governments must set binding circular economy targets and standards that provide a clear direction for the industry while supporting workers,** creating a strong business case for circularity through standardization, pricing, and subsidies. This is needed to scale circularity in an already complex industry and scale measures beyond the 'plug-and-play' approach as seen with the energy efficiency of residential buildings.<br><br>• **National authorities and municipalities should ensure circularity targets and standards include transition plans for workers, just as skills pipelines are being pushed for integration into the Renovation Wave Strategy** [77] or calls for country-level recommendations by the European Commission to strengthen National Building Renovation Plans (NBRP). [78]<br><br>**Example:** For instance, Dublin City Council's Bedsit Amalgamation Programme demonstrates how prerequisites and funding for training could be included in standards set by local and national governments in their procurement processes.<br><br>• **Transparency and disclosure initiatives** must be implemented to create visibility for workers and ensure they benefit from the policy direction towards a socially just circular transition by the European Commission and National Authorities.<br><br>**Example:** Municipalities and Social partners should adopt models like the social value scoring used by Belfast City Council for tendering projects is an apt model for ensuring procurement promotes socially and environmentally impactful projects, for example. [79]<br><br>• To reduce breaches of labour rights, **circularity guidelines, standards and targets must ensure they adhere to directives such as the Posting of Workers Directive and the Enforcement Directive**, which aim to ensure fair working conditions, protect workers' rights and maintain a level playing field for businesses. Likewise, construction workers would benefit from being included in the *Quality Jobs Roadmap* that is planned by the new Commission. [80] | • European Commission<br>• European Agency EU-OSHA<br>• National authorities<br>• Municipalities<br>• The European Economic and Social Committee (EESC)<br>• Social partners |

| Measures for a just transition | | Lead stakeholders |
|---|---|---|
| 2. Engage in sectoral social dialogue for just transition planning | • **Social partners representing construction workers and companies in the EU and Member States** play an important role in promoting a just transition. Given the imperative to simultaneously transform the image of the industry to attract new talent and to roll out targeted and effective upskilling for the existing workforce, governments must collaborate with social partners, including companies, on a long-term vision for the industry and measures to help drive this direction through tripartite dialogues.<br>• **Social partners and governments must work together to identify hotspots for reskilling**, OSH risks and market stimulation that should be prioritised through social dialogue. Such efforts would improve communication about the benefits and innovation that come with introducing circular activities more widely in the industry, creating momentum for a person-centred transition.<br><br>**Example:** The BUS-Go Circular Project offers an interesting model for an integrated and targeted approach by focusing on key occupations necessary to incorporate circularity into existing renovation frameworks, while also stimulating market demand and updating qualification standards.<br>• **Social partners, governments, and EU-funded projects should use social dialogues as a platform to share lessons** learned from the field and ensure that these insights are widely adopted in the market and integrated into educational and knowledge institutions.<br><br>**Example**: EU-level collaboration through projects like the SIDE-CIC project can ensure that lessons from Member States more advanced in certain workforce measures can be shared with others and used to advocate for new measures by national bodies.<br>• **Stakeholder groups should initiate future projects that build on the circularity-related barriers** highlighted in this paper and show commitment towards overcoming these barriers at the EU level. These can pave the way for **social partners, companies and public institutions in Member States** to develop bottom-up solutions suited to the needs of their local industry and labour market, such as for OSH. | • Social partners<br>• National governments and authorities<br>• National Enterprise Agencies<br>• European Commission<br>• European Investment Bank |

| Measures for a just transition | | Lead stakeholders |
|---|---|---|
| 3. Ensure adequate provision and investment in skills and OSH | • **The European Commission must advocate for worker-first initiatives** that prioritize skills development and OSH alongside circular economy targets, ensuring financial incentives are available for investments in skills, infrastructure, and equipment. This requires moving away from programmes that channel EU funds towards innovative pilot projects that see skills development as a by-product to projects that place labour considerations, such as OSH, at the centre.<br>• **Clear skills pipelines and micro-credentials are needed to train and attract people to a more sustainable industry.** The future of the Just Transition Mechanism will play an important role. Social partners should ensure that announcements about 'significantly increasing funding for a just transition across the next long-term budget' reach workers in the construction industry and can be utilised for both skills and OSH transition funding in collaboration with VET. [81] [82]<br><br>**Example:** Initiatives such as Aanvalsplan facilitates collaboration between entities on lifelong learning aligned with labour shortages in key industries including construction. [83]<br>• **Social partners should lead on collective and tripartite agreements on skills development, cooperating closely with VET, companies and municipalities** on setting up training plans, curricular and recognition of skills mechanisms. Sufficient funds for training, supervision and controls essential for OSH must also be available. As the impacts of circular activities on OSH become clearer, tripartite mechanisms should be used to formulate adequate responses and protections.<br>• **Direct financial support provided by front-running companies and public authorities** is needed to create individual and joint funds to support workers in upgrading their skills and attracting people into the industry.<br><br>**Example**: National employment services, such as the Swedish Job Security Councils, can play an active role in the establishment and dissemination of funds to those most in need of upskilling, as well as communications around key capacity development areas including OSH.<br>• **EU funds should also be utilised as complementary instruments for investing in skills and OSH.** This could be achieved through making OSH safeguards—for instance, in relation to hazardous materials or waste handling—a primary consideration in such packages and the transposition of circular economy standards into national policy and laws.<br><br>**Example**: The Just Transition Fund,[84] the Fit for 55 package ,and the European Social Fund Plus (ESF+) and its future iterations beyond 2027.[85] | • European Commission<br>• European Innovation Council<br>• European Investment Bank<br>• Higher education providers, including VET<br>• Municipalities<br>• National Enterprise Agencies<br>• National employment services<br>• Social partners |

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