

Stimulating demand for circular construction skills - a guide for public authorities

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Executive summary

The EU has committed to making its built environment greener in the coming years. With the introduction of the “Fit or 55” package and the proposed revision of the Energy Performance of Buildings Directive, local infrastructure and building investments are becoming increasingly driven by requirements and opportunities to apply sustainable energy technologies and circularity concepts. However, the competencies and skills needed to support a successful transition to a low-carbon and circular built environment remain a key issue that local actors are struggling to solve.

The EU-funded BUS-GoCircular project aims to address and overcome the challenges of stimulating demand for a circular construction skilled workforce, along with the hands-on capacity building to increase the number of skilled professionals within the workforce across the value chain. Local and regional governments can use a wide range of policy levers to stimulate this demand.

Through good practice and replicable examples from Europe and beyond, this document aims to raise awareness among practitioners and policymakers about their ability to promote a more circular construction sector and upskill professionals. It also highlights the various levers at the disposal of local and regional governments and public administrations to support this transition.

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Introduction

The [circular economy](#) proposes an alternative economic model, taking over from the current linear ‘take-make-waste’ economy. A circular economy seeks to extract the maximum value from resources and assets in use and keep materials in circulation for as long as possible through processes including reuse, repair, remanufacturing and recycling. Recent geopolitical events (e.g. the COVID-19 pandemic, the energy crisis, inflation, and geopolitical tensions...) have highlighted Europe’s dependency on building materials supply. Therefore, the ultimate goal of a circular economy is to establish an ecologically safe, low-carbon, resilient and just society. As the sector that extracts the most resources (50%) and emits the most CO₂ (36%), the construction sector can benefit from applying circular economy principles. These principles could reduce by 50% the embodied emissions of building materials, as many EU-funded projects have shown¹. To achieve this, the way that we design, construct, maintain, and reuse buildings and their materials have to change. Applying circular economy principles to buildings can help to preserve and reduce embodied energy, support climate mitigation targets, and minimise waste. Multifunctional green roofs, façades and interior elements (the specific focus of the BUS-GoCircular project) can help to increase biodiversity in our cities, reduce the heat island effect and improve the well-being of inhabitants. Yet, to have more circular buildings, we need more workers, a greater variety of people and professions with the relevant skills to design, construct and maintain circular buildings.

Why do skills matter?

Achieving a circular economy at scale will not happen unless the workforce acquires the relevant skills and competencies. Upskilling and reskilling the construction workforce and developing the skill sets relevant to circular construction will ensure that the built environment brings about positive social, environmental, and economic benefits. The European Commission has estimated that the number of jobs in the EU linked to the circular economy grew by 5% between 2012 and 2018 to reach around 4 million.² Circularity is expected to have a positive net effect on job creation if workers acquire the relevant skills.

¹ Build Up Portal, [Circularity and Low-Carbon Building Materials in Construction](#), (2022)

² European Commission, [A new Circular Economy Action Plan - For a cleaner and more competitive Europe](#), (2020)

However, estimates show that more than three-quarters of companies across the EU report having difficulties finding workers with the necessary skills. For this reason, European Commission President von der Leyen proposed in her 2022 State of the Union address to make 2023 the European Year of Skills, in a bid to strengthen competitiveness, better target investments, and cooperate with companies. A skilled workforce has the potential to contribute to sustainable and more innovative growth, and improve companies' competitiveness³.

Box 1 : The European legislative framework for circular construction

The construction sector accounts for 50% of material extraction in Europe, 36% of CO₂ emissions and generates more than 35% of Europe's waste. The European Union committed to becoming climate-neutral by 2050, and achieving an economy with net-zero greenhouse gas emissions. Regarding the impacts of the building sector, many policy initiatives and incentives have been launched to reduce the building sector's footprint.

The European Commission recognised the construction sector as one of eight sectors with high potential for circularity in its second Circular Economy Action Plan (2020). This has led to various sector policy initiatives, including the revision of the Construction Products Regulation (CPR) and the development of the EU's Level(s) assessment framework for sustainable buildings, to be incorporated into Green Public Procurement (GPP) criteria and technical screening criteria for circularity of buildings in the second phase of the EU Taxonomy for sustainable investments.

As part of the Green Deal, Europe has launched the Renovation Wave to intensify renovation efforts throughout the EU, including circularity as a means of achieving this goal. The Commission's 2021 "Fit for 55" energy and climate package will also reinforce the path towards a more carbon-neutral Europe.

In response to EU law and policy initiatives, some countries have embedded circularity principles at the national level. With its Anti-waste and Circular Economy Law adopted in 2020, France has paved the way to circularity with measures such as a new Extended Producer Responsibility (EPR) for construction products and mandatory pre-demolition diagnosis.

Local authorities can boost demand for skilled professionals

Public authorities have an important role to play in the transition towards a more circular built environment and have a range of policy levers at their disposal to stimulate demand for relevant skills. These range from developing a circular economy roadmap and dedicated public procurement training programmes to providing financial incentives.

³ European Commission, [Commission kick-starts work on the European Year of Skills](#), 12th October 2022.

The various competencies that local authorities can use directly (e.g., training for their employees) and indirectly (e.g., embedding mandatory circular criteria in urban planning documents) to influence construction skills are outlined below:

- **As a master planner:** local and regional governments can embed in their roadmaps, plans or strategies objectives and measures to encourage the upskilling and reskilling of the construction workers;
- **As building owners and public procurers:** public authorities are owners of large building assets, large buyers of construction and demolition services, and employers of practitioners responsible for building programmes. By stimulating demand for more circular buildings and the underlying skills, public authorities can lead the transition;
- **As an economic developer:** by supporting training organisations and companies which are adopting more circular business models to develop their activities (by offering lower rents, reserving land for certain economic activities), local authorities may influence the market trend and help in jobs creation;
- **As a financial partner and regulator:** in a new market that is still adapting its business model, financial grants, subsidies, and tax incentives are key levers to develop a new economic sector and to encourage workers to upskill;
- **As a network facilitator:** social housing companies, private developers, and different stakeholders can be encouraged by local authorities to change their demolition, renovation and building practices in the local area. Many tools, such as digital platforms, training sessions, and storage platforms, could help to support this transition and upscaling;
- **As an urban planner:** the most indirect lever, but also the most impactful in the long-term, is to embed circularity requirements in urban planning regulations.

Public authorities will need to use a combination of policy levers to support the upskilling and reskilling of the construction workforce. Also, different levels of governance will need to collaborate to support this transformation.

Local policy levers to promote circular construction skills

1. Set targets in a circular economy strategy

Roadmaps and strategies help to set a direction, set the level of ambition, and engage stakeholders in the process. They also help to integrate circularity as a cross-cutting topic within sectoral policies (housing, procurement, urban planning, economic development...).

Many [cities](#)⁴ have adopted their circular economy strategies (such as [Copenhagen](#), [Paris](#), or [Prague](#)), and construction is often highlighted as a key sector.

Public authorities can set short-, mid-, and long-term goals for the number of jobs they want to create in the construction sector. For instance, the [City of Rotterdam](#) conducted a baseline study for the number of circular jobs in the city and identified circular opportunities in key sectors, including construction.



Rotterdam has established a roadmap for circularity running from 2019 to 2023.

The city of Rotterdam wants circularity to become standard practice by 2030, aiming to reduce primary resource use by 50%. To achieve this, Rotterdam seeks to create 3,500 to

⁴ The Circular Cities Declaration, an initiative managed by ICLEI - Local Governments for Sustainability, brings together cities and local authorities transitioning towards a circular economy.

7,000 jobs that contribute directly to the circular economy. To understand where the focus should be, at the end of 2017, Rotterdam initiated a project to map the next steps needed to inspire the circular transition within the city. A baseline assessment was carried out to measure the number of circular jobs across various sectors and their distribution around the city. It was estimated that 10% (31,000 jobs) of all jobs in Rotterdam were circular - above the Dutch average (8.1%). A higher representation of design and digital technology roles were located in the centre, while more direct circular jobs such as repair services were rather located on the city's outskirts.

Developed under the [URBACT](#) programme, Riga City Municipality has an [Integrated Action Plan](#) for the transition to a circular economy specifically in the construction sector. One of the actions is to incorporate within the next two years an introduction to a circular economy course in higher education and master's programmes. Another action is to introduce lifelong learning programmes for construction professionals, targeting the development of three training courses for specialists in the circular economy in construction within the next four years.

2. Procure and own circular buildings

Circular public procurement is a powerful tool that public authorities can use to stimulate demand for circular buildings and the relevant skills. By embedding criteria in tenders for certain building standards, certifications, or qualifications, public buyers can send a signal to the market and encourage the development and learning of circular construction skills. Those criteria can be embedded in the different phases of a building's life cycle: construction, maintenance and repair, renovation, and demolition.

Public authorities can have a more direct influence on the demand for circular construction skills through the management of publicly owned assets and infrastructure. Local authorities can boost this demand by requesting on-site training on their construction sites, and by training their own employees in charge of the tenders.

Provide internal training for practitioners and policymakers

To publish more circular tenders, either for demolition, renovation, construction or maintenance, the local authority's staff has to be skilled and/or trained. The Dutch Ministry of Infrastructure and Water Management has developed a [Circular Public Procurement Masterclass](#) to train its staff on how to procure more circularly. Similarly, the department

responsible for building construction and maintenance should be aware of circular construction challenges. Training its staff is the most direct way that local authorities can promote circular skills. Internal training could involve practitioners as well as policymakers.

However, if the internal staff is not yet skilled for this challenge, it may be helpful to acquire circular construction skills from a consultancy agency that could support the circular targets all along the project.

Procure selective demolition, and deconstruction services

The construction sector will only become fully circular if building materials are reused and repurposed at the end of the functional life of buildings. For buildings that cannot be renovated or retrofitted, public authorities can ensure that these are selectively demolished and deconstructed. For instance, four demonstration cities of the EU-funded [City Loops project](#) - Bodø (Norway), Mikkeli (Finland), Roskilde and Høje-Taastrup (Denmark) - have used [pre-demolition inventories and material audits](#) to identify building components and materials with reuse or recycling potential. To conduct such a process, public authorities need to hire people with the relevant competencies in reusing or recycling building materials. Proficiency in 3D visualisation tools, life cycle analysis (LCA) and life cycle costing (LCC), material passports (BIM), and online material marketplaces can help architects and other professionals to identify potential new uses for secondary materials. Though certain technologies can help, human skills are necessary to determine which materials have reuse potential.

For all buildings being demolished with a floor area greater than 1,000 m², it is now mandatory in France to complete a diagnosis of how the construction products, materials and waste will be managed and reused following the works. This is one among many measures introduced through the 2020 French Anti-waste and Circular Economy Law⁵ to manage and reuse construction waste.

Once the materials to be reused have been selected in the pre-demolition audit, it is crucial to ensure that the contractor can carry out selective demolition. As this task requires human labour, it presents an opportunity to hire Social and Solidarity enterprises and increase public tenders' impact on inclusion policies.

⁵ Journal officiel de la République française, LOI n° 2020-105 du 10 février 2020 relative à la lutte contre le gaspillage et à l'économie circulaire (1), (2020)

Furthermore, contractors can only reuse and recycle materials if there is the appropriate infrastructure in place to collect, sort, and reuse construction materials. Public authorities can invest in and support resource management systems such as material exchange platforms, industrial symbiosis, sorting and recycling facilities, as well as the knowledge and underlying skills to manage and execute these material loops.

Prevent construction waste by design

As the saying goes, the best energy is the one we do not consume. The same principle also applies to waste. Considering that the best waste is the one we do not produce, one of the first things to consider is whether a building could be renovated instead of being built from scratch. However, if and when new construction appears to be necessary, the building's end-of-life phase has to be conceived from the planning stage. The [BAMB project](#) (Buildings As Material Banks) aims to limit resource consumption in the building sector by developing multifunctional buildings, and thereby extending building lifespans and limiting premature demolition. In this way, buildings are no longer perceived as a static object, but rather as a temporal and dynamic storage of materials that can be disassembled and reused for new purposes. To ensure materials data storage and traceability, material passports have to be developed. This requirement should be then embedded in tenders to recruit the designer.

Integrating reused materials (either in a renovation or a new construction project) is also a way to boost demand both for secondary materials and for the necessary skills. The City of Paris has renovated [Les Canaux](#), a building intended to host social and solidarity companies, with an objective of 100% reused materials, bio-geo-sourced and/or containing 15% recycled material. The renovation project involved over 40 local companies to handle and transform the different materials (metal structures, floors, sanitary fittings, interior elements...).



Les Canaux, a demonstration project for the City of Paris
with reused materials - © The City of Paris

Public authorities could also be inspired by the City of Haarlem in the Netherlands, which has embedded environmental and circular criteria in its tenders. These requirements are used as award criteria for road works and civil engineering works. Tenderers have to provide information on what will happen with the materials once they are used and the possibilities for reuse and recycling. This information is filled in the [DuboCalc](#) tool, which compares offers based on their ecological footprint, including circularity.

Maintain, retrofit and refurbish

Throughout the functional life of a building minor repairs and maintenance work have to be done to extend a building's lifespan. Retrofitting and refurbishment works can help to reduce the energy consumption of buildings and upgrade them to new building standards. The type and nature of green roofs and façades maintenance work needed will evolve throughout the lifecycle of a building. Therefore, the skills required to maintain, refurbish, retrofit, or upgrade buildings will also evolve over time.

The Spanish Royal Decree on the *residential rehabilitation and social housing of the Recovery, Transformation and Resilience Plan* states that building design and construction techniques should ensure circularity⁶. By enabling flexible and adaptable building designs,

⁶ Real Decreto 853/2021, de 5 de octubre, por el que se regulan los programas de ayuda en materia de rehabilitación residencial y vivienda social del Plan de Recuperación, Transformación y Resiliencia.

such as modular construction that promotes material reuse, retrofitting or refurbishment works can be an opportunity to adapt a building to evolving needs. Building capacity among the construction workforce on building standards such as [ISO 20887 on designing for disassembly and adaptability](#), will ensure that the use phase of buildings can be prolonged for as long as technically possible. As these construction techniques are relatively new, public authorities can help to test them by supporting pilot projects.

Include training clauses in tenders

Including training clauses in tenders is one way that public procurers can have a direct impact on stimulating demand for circular construction skills. When the winning contractor is awarded a contract, these clauses ensure that they commit to training their staff during the project in a specific set of skills.

As a result, contractors have to dedicate some time, budget, and means to train their employees (construction workers and site supervisors), possibly directly on-site. By embedding these clauses within the tender, public administrations give professionals a direct opportunity to upskill. Such clauses have been trialled as part of the [BUS League](#) project in four countries (Bulgaria, Ireland, France, and Spain)⁷.



On-site assessment of energy efficiency skills of workers in Spain - © BUS League project

⁷ [D.3.2 Using Public Procurement to Incentivise Upskilling - Best Practice Guide](#) - BUS League

To go further, a circular experimental building could be an opportunity to develop proper training on circular construction, as Paris did with the [“Circular building pathways”](#) training. The City of Paris has thus developed its training programme during the “Les Canaux” renovation project described above. They relied on this project to raise awareness and train Paris’s technicians as carpenters, masons, and apprentices on new circular construction techniques.



Circular building pathways training for masons - © The City of Paris

This training is supported by two training organisations, the association Les Canaux for the workers’ course and Ekopolis for the project owners’ and project managers’ course, as well as by the organising partners, the City of Paris and the architect agency Grand Huit, which was also the building renovation tenderer. After the first session, the training was made available to external stakeholders, covering the entire value chain, from project management (architects, design office) to site technicians (workers, craftsmen, technicians), supported by external funding from the regional government (Île-de-France Region) and the French Agency for Ecological Transition (ADEME).

Box 2 : Recognition for skilled professionals

In recent years, several initiatives have been undertaken around Europe, aimed at recognising the skills of professionals, such as the [Train4Sustain](#) project. Many of these initiatives have taken the form of "skills passports" or "professional cards".

Developing these schemes for recognition provides many advantages for professionals, as well as for public procurers:

- Professionals have information about themselves in a friendly and attractive format that they can show to others (if they have a card or similar) or through digital media, by publishing their recognition scheme on their CVs, website, blog, or social media;
- This increases visibility and highlights the qualification of professionals, favouring their recruitment and giving them a competitive advantage;
- This motivates professionals to continue training, which results in a better professional performance and a higher quality in the services offered;
- The information is authenticated and validated by the issuing bodies and should therefore be hosted on an official website, which lends credibility and transparency to the system;
- With the prior authorisation of the professional, the data is published for free consultation, so that companies and users can hire the services of a professional according to the competences they hold.

Embedding this type of recognition (passport, skills card) within the tenders is definitely a pushing action to increase demand on skills.

3. Act as an economic developer

Relocating production and factories back into cities can help to develop local material loops. Therefore, local authorities can reserve land and zone areas for companies that have or aim to develop a circular business model.

In 2012, in northern Amsterdam, the municipality launched a tender to build a new hotspot on sustainability and circularity in the post-industrial neighbourhood of Buiksloterham, to be turned into a mixed-use residential and commercial area. The City of Amsterdam awarded four plots of land to pioneer initiatives which focused on sustainability and circular urban development. A team of landscape architects, engineers, creatives and social entrepreneurs had been hired to develop it, and the city secured the land for a 10-year lease.



De Ceuvel hotspot in Amsterdam - © Metabolic

Two years later, in 2014, [De Ceuvel](#) was born: a cultural urban hub which aims to be the symbol of the social transition to a contemporary circular lifestyle. The hub hosts companies that foster circular, energy, and sustainable mobility solutions. Some events such as training and lectures are also organised to raise awareness among entrepreneurs as well as the general public.

As a demonstration project to reconcile cities and factories, a new kind of in-town factory [Earth Cycle](#), was built in the northeastern Parisian suburb of Sevran. Supported by the [UIA program](#), it has set up an innovative industrial process to reuse soil extracted from excavation sites of the new subway and other construction sites as a raw material. The significant innovation lies in the creation of an industrial process using extracted soil as raw material. Three kinds of materials are produced (bricks, clay panels, wall plastering/rendering) and used in construction sites in urban areas after having received appropriate technical certification.



The urban factory has opened in September 2021 - © Cycle Terre

Upskilling building workers and unemployed people by developing new local jobs is also one of the goals of the project. A partner specialised in inclusion and employment policy is also part of the consortium.

4. Provide financial incentives

There is a wide variety of subsidies that public authorities can employ to stimulate demand for circular construction skills, namely: grants, direct payments, loan guarantees, and special tax breaks.

Provide direct financial support

Financial support in the form of subsidies, grants, and investments signal public commitment towards the development of new industries and are critical in directly stimulating demand for circular construction skills in both the labour market and the construction sector.

In 2014, the City of Hamburg adopted its Green Roof Strategy to mitigate the effects of climate change and better manage rainwater. As part of the strategy, the City's Ministry for Environment and Energy committed to providing [€ 3 million until the end of 2024](#) in financial support to building owners to cover up to 60% of the costs of the installation of green roofs. These subsidies are intended to incentivise private building owners to demand green roofs,

which in turn would result in hiring the relevant labourers with the skills and qualifications to install these green roofs.

Another example of subsidies employed in stimulating demand for circular skills is Skillnet Ireland, the business support agency of the Government. Through its sector-specific [Construction Professionals Network](#), it provides partial funding for construction companies that train and skill their workers in circular construction.

Lastly, given the novelty and complex nature of demand-driven policies, investing in spaces where novel innovative policies to promote the transition to a circular construction sector is critical to “getting it right”. Such a policy experimentation space has been set up in the [Policy Lab](#), a collaboration between Slovenia and EIT Climate-KIC, which will lead to a funding strategy and investment plan, among other actions.

Provide financial and tax incentives

Tax incentives based on the environmental impact and circularity of a construction project can be instrumental in reducing negative externalities such as the use of materials (instead of labour), as can the pricing and taxing of carbon emissions.

Specifically, they can be employed to stimulate demand for the use of circular materials, and as a result, skills. An example related to energy efficiency improvements (but replicable for circular measures) is the recent [“Eco Bonus”](#) scheme of the Italian government, which allows the deduction of up to 65% of the costs incurred for energy efficiency upgrades from the taxable income. This deduction can reach 75% if the energy performance improvements are in communal spaces of apartment buildings. Furthermore, depending on the renovation work done, the maximum amount deducted can reach € 100,000. In 2022, the [Super bonus](#) went even further – paying for thermal insulation, heating systems and solar panels.

Another fiscal measure is tax rebates, which could come in the form of an annual property tax rebate for owners whose new built or renovation projects meet specific circular and environmental criteria. The Dutch government has introduced tax incentives and defined a pre-validated list of criteria that determine the eligibility of projects for tax rebates. These incentives include faster depreciation of environmental investments (up to 75% in the first year) and a further tax rebate for the purchase of assets.

The introduction of a virgin resources tax, or the so-called Value Extracted Tax — which focuses on resource use, similar to the widely-used Value Added Tax (VAT) for consumption — can be instrumental in shifting the tax burden from labour to resource use and consumption, incentivising materials savings and cycling. Certain countries such as the United Kingdom,⁸ France,⁹ and Belgium¹⁰ offer reduced VAT rates of around 5% for the renovation of dwellings under certain conditions. These kinds of tax cuts provide fiscal incentives to homeowners to hire construction workers. Extending these VAT reductions for the installation and maintenance of green roofs and façades, as well as material reuse, could encourage private building owners and homeowners to incorporate more circular features on their buildings.

Almost without exception, landfill taxation in Europe is a nationally set tax, where in some countries the municipalities collect the proceeds. This financial instrument is highly conditional to the municipality having the legal authority to levy a tax and control the transport of waste out of the city. [Europe-wide research has shown](#) a strong correlation between a reduction in landfilling and landfill taxes and bans. At the same time, estimates suggest that for every 10,000 tonnes of waste generated, incineration creates 1 job, landfilling creates 6 jobs, recycling creates 36 jobs, and up to 296 could be created through refurbishment and reuse.¹¹ As a result, adjusting fiscal incentives to promote repair, refurbishment, and recycling while disincentivizing landfilling and incineration could support job creation and the development of new skill sets.

Use European funding to invest in skills

The European Union has a number of funding and technical support mechanisms in place designed for investments in upskilling and reskilling programmes. The [European Social Fund Plus \(ESF+\)](#) with a budget of more than €99 billion for 2021-2027 is the EU's main instrument for investing in skills. Through Cohesion Policy funding, Luxembourg will benefit from €67 million in funding between 2021-2027 to, among other things, help improve the skills of unemployed people and employees, as well as improve the energy efficiency of

⁸ HMRC, Buildings and construction (VAT Notice 708), 2022

⁹ Direction de l'information légale et administrative (Premier ministre), Taux de TVA pour les travaux de rénovation d'un logement, 2021

¹⁰ BDO, What will change in VAT in 2022 and beyond?, 2022

¹¹ EPA (2002) Resource conservation challenge: campaigning against waste. Available online. and the institute for local self reliance here

public buildings, and reduce CO2 emissions in the construction sector.¹² The EU's [Recovery and Resilience Facility](#) can also help Member States invest in green skills and jobs and circular economy activities.

Another example is the ERASMUS-funded [GUPP \(Global University Pathway Program\) programme \(2019-2022\)](#). It aimed to address challenges in the construction sector, by responding to the need to accelerate a resource efficient and circular economy transition, in line with the EU's energy and environmental goals. In parallel, GUPP enhanced educational sector capacity building by integrating innovative learning tools and resources, and providing high-quality flexible training for public authority staff and professionals. Twelve new micro-learning units designed for local authority procurement staff have been developed and piloted on 100 people in the four partner countries (Ireland, France, Greece and Slovenia). The curricula covered diverse topics such as an introduction to Green Public Procurement (GPP), EU Level(s), Life Cycle Assessment, Life Cycle Costing, circular economy and GPP and BIM (Building Information Modelling). The lectures are available on [this platform](#) until 2025.

5. Raise awareness and build capacity

Besides financial incentives, demand for training and education on circularity skills is largely driven by market demand for sustainable buildings. By using their position in stakeholders' networks and value creation chains, local authorities can organise and conduct large-scale communication campaigns to promote demand for "green" and environmentally-responsible buildings. Public authorities can also engage stakeholders through capacity building and training programmes, and help them to develop relevant skills and capacity.

For example, the [nZEB Roadshow](#) project organised in Bulgaria, Croatia, Greece, Italy and Romania local "nZEB Days". These multi-component events included policy conferences, construction fairs, practical demonstrations, games for children and adults, career orientation, lessons for elementary schools, media and public events. It also delivered various training courses for local designers, construction workers, homeowners' associations and municipal officials, often delivered in collaboration with product suppliers participating in the fairs. The municipalities provided space, facilities and communication support to the

¹² European Commission, More than €67 million for Luxembourg to support its green and digital transition, jobs and inclusion, 2022.

organisers while benefiting from the increased knowledge about the local value chain and establishing contacts with a variety of stakeholders.



A nZEB Roadshow's event in Bulgaria - © nZEB Roadshow

Over a little more than two years, 33 NZEB roadshow events were organised in the five countries, attracting over 11,000 registered visitors. 896 construction specialists attended the project-related training courses at the NZEB days and another 3,236 at other events.

Project [O-House](#) is another example of public authorities promoting circular construction. The project was initiated by Kongsvinger regional council in Norway and is the prototype of a residential building that uses up to 50% recycled building materials, with the rest sourced locally as much as possible. O-House is also a mobile prototype that is being shown in other municipalities to educate stakeholders and increase confidence in the circular economy. This approach helps the regional council to promote circular construction and lead by example, while working closely with local stakeholders and representatives of the supply chain.

More specifically on circularity skills, the [City of Brussels](#) decided in 2019 to reduce its unemployment rate by employing workers in niche activity areas such as high-quality renovation works and [circular construction](#). Brussels' Be Circular initiative provided skills development programmes that include various circular construction training modules. In October 2020, a brand new programme to train and guide Brussels companies towards circular construction called [Build Circular.Brussels](#) was launched.

Through free training supervised by experts and personalised support on circular construction, the programme is aimed particularly at SMEs and VSEs (very small enterprises), which represent nearly 90% of construction companies. Project owners and

contracting authorities have free access to the programme website, on which companies that have undertaken these training courses are mentioned. This support measure was part of the Brussels recovery plan from the COVID-19 pandemic and plans to train and support nearly 600 construction companies. The programme has been entrusted to the Brussels-Capital Construction Confederation (CBB-H) and to BRC Construction, two active players in the Employment-Environment Alliance.

6. Facilitate and promote networking

By developing synergies between stakeholders to exchange reused materials (contracting authorities, social housing companies, private developers, construction companies...) and by providing tools (digital and physical platforms, databases, toolkits...), local authorities can boost circular construction skills at scale.

Industrial symbiosis at the local level goes hand in hand with working with local stakeholders. Africa's first and multiple award-winning industrial symbiosis programme, the [Western Cape Industrial Symbiosis Programme \(WISP\)](#) in Cape Town, attempts to connect companies so that they can identify and implement business opportunities by using unused or residual resources (materials, energy, water, assets, logistics, and expertise). The programme has three facilitators, each specialised in a sector. They provide technical expertise and capacity to businesses to help them become more resource efficient and overcome challenges. The programme helps to identify opportunities to reuse and recycle secondary raw materials generated in manufacturing processes, including [construction waste](#). While the service is free of charge, in exchange, companies are asked to provide information about the impact of the synergies. The programme is funded by the Western Cape Government and delivered by GreenCape, a non-profit organisation. The programme has led to the creation of 69 permanent jobs in member companies, as well as 25 temporary positions and 218 economy-wide jobs.



*The Mayoral Committee Member For Economic Opportunities And Asset Management, Alderman James Vos
visiting a WISP member © Invest Cape Town*

More focused on the construction sector, the city of Oslo (Norway) maintains a database of demolition projects to serve as a material bank for construction projects in the city. When sites owned by the city are demolished, social enterprises are given the chance to reclaim materials.

To upscale circular construction not only for public works, Toulouse Metropolis (France) has put in place a support desk as a single point of contact for local stakeholders, within the LIFE [Waste 2 Build](#) project. A charter has been signed by private and public contracting authorities.



*Signatories of the charter within the
Life Waste2Build project - © Synethic*

The signatories will have free access to innovative tools to increase the synergies between construction sites and to increase their traceability (digital and physical platforms) and to allow the actors to increase their skills (training dedicated to contracting authorities, bidders...). This metropolitan “support desk” concept is intended to be deployed throughout the region.

7. Plan for the long-term

Despite having a lower impact on skills in the short-term, urban planning is definitely the most important lever in the long-term. Defining clear objectives on the types of buildings and their environmental requirements within urban planning and zoning documents is a key action to upscale circular construction, and therefore, to increase demand for skills. These documents impact the way that buildings and construction materials are used and reused as well as their physical character, and they also define which areas of a city or region will be repurposed. By means of spatial planning, the municipality can divide and classify the physical environment in a way that promotes circular resource management.

The [City of Brussels](#) has mapped out abandoned and unoccupied buildings across the city. Having such a map can help to predict construction projects in the pipeline across the city and define what resources will be needed to undertake these renovation and reconstruction projects. It can give a signal to the labour market on the number of vacancies and the skills required to undertake these upcoming projects.

A similar approach has been taken in the Czech City of Brno, which has [mapped the city's brownfield sites](#). The map provides not only a complete list of brownfield sites and their locations, but also provides useful information regarding the ownership of the building sites, legal aspects and other risk factors that might hinder the area's development.

Brno is also a pioneer in the field of circular procurement related to urban planning. The intention of the City of Brno is to plan, design and build a "Smart District" called [RE:Špitálka](#) that is as sustainable as possible, using various modern technologies or approaches to this end. The Smart District will serve as a pilot district to test fulfilment of the city's goals for 2050 (in the areas of environment, prosperity, resources, services and governance) within a shorter time frame, so that the deployed measures can be evaluated and possibly further extended to other areas of the city.



The plan is based on the principles of redesign, rebuild, reuse, resource, resilience, responsibility and responsiveness. To implement these principles, especially those related to circular construction, the procurement authority places a lot of emphasis on preparation and tries to manage the project from the beginning (e.g, before selection of the contractor for design and construction), so that the environmental objectives are met. It actively brings together stakeholders and external experts, prepares studies, white papers, and evaluates financing models. This approach emphasises preliminary market consultations and tests what is viable in the field of circular economy on a regional level. Although the direct impact on circular skills is yet to be seen, it sends an important market signal and actively articulates the demand for circular economy initiatives needed to fulfil the city's long-term goals.

Recommendations for local governments to promote circular construction skills

This document has highlighted some of the policy levers and measures that local, regional and national governments can already use to stimulate circular construction skills. The table below is a recap about the recommendations exposed throughout the document :

	Short/mid - term	Long-term
Direct impact on skills	<ul style="list-style-type: none"> • Provide internal trainings for practitioners • Develop specific on-site training • Include clauses in tenders to provide dedicated training on relevant circular construction skills for staff and new recruits • Procure selective demolition services • Make pre-demolition audits on all buildings compulsory • Design the building's end-life phase at the design stage • Integrate reused materials in a new construction • Provide dedicated funding to up- and reskill unemployed and disabled people • Develop free training for building companies 	<ul style="list-style-type: none"> • Set up a circular economy strategy with a clear focus on upskilling in the circular construction • Use European funding (i.e. ESF+) to invest in skills development projects • Develop a financial incentive (i.e. Eco-bonus) on reused materials • Tax rebates for building projects meeting circular criteria • Increase landfill taxation rates • Embed circularity principles within the urban planning and land zoning documents • Develop raising awareness campaign on circular construction
Indirect impact on skills	<ul style="list-style-type: none"> • Save and reserve land for companies with a circular business concept • Provide direct financial support to these companies • Develop and program (chart, single desk...) to connect and help stakeholders • Develop tools (online platforms, database...) to connect stakeholders 	

Providing the construction workforce with the skills and tools necessary to transition towards a more circular built environment will not only help to reach energy efficiency and climate targets, it will also enhance competitiveness and future-proof the construction sector.

With a wide range of actions, local governments are well positioned to support skills development. However, it appears the biggest challenge will be to develop circular skills at scale. Oftentimes at the forefront of leading experimental projects, local authorities might use these demonstration actions to engage in dialogue with the regional, national and European levels. Legislative barriers could thus be overcome and as a consequence, circular construction principles might be erected as the norm.

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Colophon

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