Contribute to accelerating the transition to a circular economy in the built environment through a funded collaboration with the Circular Buildings Coalition.

Learn more here: www.circularbuildingscoalition.org

Supported by:
Laudes Foundation
Metabolic
“Metabolic is excited to join the Circular Buildings Coalition and support the transformation of the built environment to a circular economy. The circular economy is a new economic model for addressing human needs and fairly distributing resources without undermining the functioning of the biosphere or crossing any planetary boundaries.”

Circle Economy
“We believe the built environment should be a ‘living’ system in which building materials and products are optimally used and reused—a system that operates within the boundaries of our planet, preserves the (business) value of its resources, and ensures the wellbeing of its inhabitants.”
https://www.circle-economy.com/programmes/built-environment

Ellen McArthur Foundation
“By applying the principles of the circular economy to the way we design buildings, infrastructure and other elements of the built environment, we can reduce greenhouse gas emissions, while creating urban areas that are more liveable, productive and convenient.”
https://ellenmacarthurfoundation.org/

World Green Building Council
“We believe it is time for a peace treaty with nature. We envision a future where the built environment not only does less harm, but actively regenerates our planet, climate, and human health, and offers the highest wellbeing and quality of life to all.”

World Business Council for Sustainable Development
“There needs to be an acceleration of the transformation towards a net zero carbon, circular, healthy, inclusive and resilient built environment. This transformation to succeed will have to involve the full building value chain, from materials and equipment suppliers, architects, construction companies, utility and service companies to developers, investors, owners and users and urban planners.”

ARUP
“Since 2016 Arup has been the knowledge partner for the built environment with the Ellen MacArthur Foundation, combining our 75 years of deep built environment delivery expertise with over 10 years defining and framing the conversation on the transition to a circular economy. We are thrilled to continue supporting the Foundation in the Circular Buildings Coalition, and looking forward to collaborating with the partners in accelerating the adoption of circular economy principles in the European built environment.”
**WHAT THE CBC AIMS TO DO**

The main barriers to transitioning to a circular economy in the built environment have similar underlying roots at local, national, and European levels. Separately, these challenges are being addressed by many global and local impact-driven organisations that are already leading the way on the ground. How can we move forward? As a coalition, we aim to accelerate the transition towards a circular economy in the built environment in Europe by:

1. **Creating a common understanding of the challenge and opportunities ahead**
   A broadly supported understanding of the systemic challenges will help the industries set priorities for intervention. The CBC has released an initial report entitled ‘Towards a Circular Economy in the Built Environment; overcoming market, finance and ownership challenges’ to provide a review of the challenges of creating markets for secondary materials, growing flows of finance into the development of a circular economy in buildings, and establishing new ownership and business models that can facilitate the transition (download here). It is based on stakeholder interviews in the industry, literature review, desk-top research and bottom-up modelling of material flows in this sector.

2. **Cultivating alliances and joining forces to formulate key ambitions, frameworks and policy**
   Currently, many initiatives and stakeholders are undertaking excellent work, yet need to be coordinated in order to reach a shared understanding and amplify their impact. Led by WBCSD, the Coalition thus aims to create a measurement framework for circularity in buildings, for example, which will be of practical value to decision making (See white paper: Measuring Circular Buildings by WBCSD). Similarly, led by the WorldGBC, the Coalition aspires to create industry-wide ambitions for circular buildings, supported globally. It also aims to mainstream analysis tools and practices to kick-start policy discussions in geographies in which circular ambitions are not yet well-defined.

3. **Amplifying proven solutions**
   A large number of projects and initiatives exist that can serve as blueprints to accelerate the transition towards a circular economy in the built environment, such as policy innovations (e.g. procurement that demands the reduction of virgin material use), technical innovations (e.g. recycling cement) or building projects (e.g. reusing materials). To drive a step-change in this transition, the Circular Buildings Coalition challenges initiators of these projects to think deeply about how such initiatives can be scaled: replicated in other geographies, taken up by other companies, and improved and made more effective in their methodologies through blueprint projects.

**WHY THE CBC EXISTS**

The construction industry is a key engine of economic activity, directly creating 18 million jobs and accounting for roughly 9% of the EU’s GDP. The industry contributes approximately 277 Mt CO₂e per year, representing almost 9% of the EU’s annual greenhouse gas (GHG) emissions. It also generates 35% of all waste in Europe. Given its immense ecological footprint and impact on human wellbeing, the built environment is a key lever point in achieving the goals put forward in the Paris Agreement as well as many other sustainability objectives.

The transition to a circular economy in the built environment is essential to eliminate this 35% of waste, reduce pollution and circulate materials and assets at their highest value. It is also an essential enabler to decarbonisation. The Circular Buildings Coalition has been established as a vehicle to coordinate built environment stakeholders to accelerate this transition. It is an initiative of Metabolic, Circle Economy, World Green Building Council (WorldGBC), World Business Council for Sustainable Development (WBCSD) and the Ellen MacArthur Foundation in collaboration with Arup, funded by the Laudes Foundation.
CALL FOR BLUEPRINT PROJECTS

We invite industry frontrunners to share their ideas on how to overcome existing barriers to scale or create demand for their solutions that accelerate the transition to a circular economy in the built environment. Organisations submitting blueprint projects will be keen to contribute to enlarging the market for their solutions, or solutions like them, to benefit all while contributing to the public good of accelerating the transition towards a circular economy in the built environment. Furthermore, engaging the blueprint project process will help increase recognition for their work and increase visibility.

What is a Blueprint Project?
A blueprint is an existing solution that is developed or modified for the benefit of the public, which can bridge critical gaps in the shift to a circular built environment, and which can be replicated and/or expanded upon by others.

How does it work?

**Phase 1**
Eight selected organisations will receive 20,000 euros to produce a white paper which:
- Includes proof of the feasibility of the solutions;
- Demonstrates how the solution addresses one of the systemic challenges;
- Creates a plan for the solution to be scaled;
- Includes information of the tool/process (e.g. a methodology that would allow the tool to be used by others in the industry).

Blueprint projects are intended as a contribution to the sector, and the CBC will openly publish and disseminate the solution so that it can be taken up by others as a guide and inspiration. The first phase is self-contained, meaning that the white paper is a stand-alone document.

**Phase 2**
Blueprint projects selected in the first phase will also be asked to apply to a second phase, in which four selected organisations will receive 75,000 euros to support the execution of the scaling plan developed in the first phase, to pilot the dissemination of its solution.

Throughout the first and the second phase, there will be opportunities to receive input from the organisations participating in the Circular Buildings Coalition.

HOW TO APPLY?

Both nonprofit and for-profit organisations in EU27+UK, Norway and Switzerland can apply. Partnerships are encouraged.

For more detailed information and to apply with a blueprint project, follow the link below.

www.circularbuildingscoalition.org/open-call
1. Blueprints for the financial sector

Some causes for limited finance of circular buildings include a lack of well-established circular business cases, the perceived risks of circular construction, the limited presence of financial incentives for circular construction, and the lack of appropriate instruments to steer and monitor the impact of investments in circular buildings.

The coalition aims to develop and support tools that enable the financial sector to direct significantly more funding to circular construction and asset management sectors. This requires the development of novel financial models, incentives and insights that contribute to the creation of successful business cases, allowing the financial sector to become a key player in the transition towards a sustainable built environment.

We are calling for blueprint projects that are potentially scalable and that demonstrate the following ways:

- **Capturing the unrealised salvage value (residual value of its materials minus dismantling costs) of a building.**

  Entering the salvage value of products and materials that will remain at the end of a building’s life cycle can improve solvency ratios while allowing businesses to finance and trade these materials with future contracts. In one estimate, the whole life cost of ownership decreased by 5% over 10 years for a retail fit-out when such contracts are used. We are looking for new tools to capture this value, and connect financial institutions to demolition companies to improve accounting for salvage value.

- **Revisiting existing accounting practices to account for ‘real’ depreciation (in line with observed technical degradation) per building layer.**

  The prevailing practice of chunking building layers into indivisible assets (e.g. building structure and envelope) to depreciate them fundamentally contradicts the principle of retaining materials and building components at their highest value; many building layers (e.g. structure) do not materially degrade at the generally assumed rates of depreciation. We are looking for blueprint projects that facilitate the scaling of accounting practices in line with circular principles.

- **Accounting for the positive externalities presented by the long-term positive social, environmental and economic impacts of buildings aligned with circular principles.**

  This includes accounting for how circular construction should approach systemic, transitional and physical climate risks in monitoring the value of assets with alternative discount rates, carbon credits or other tools.

- **Increasing transparency by the widespread adoption of measurement frameworks to make this value visible and actionable.**

  This includes mainstreaming approaches such as material passports and harmonising frameworks for measuring the extent to which buildings align with circular principles.

2. Blueprints for markets for secondary materials

In a future circular built environment, buildings will not be static material deposits, but banks of potential secondary materials that can be reutilised in continuous cycles. A well-functioning market for secondary materials is a critical component of this future. To achieve this, the policy and infrastructure landscape of the construction sector needs to undergo a significant transformation, with important roles to play for both the public and private sectors.

The **private sector** has an important role to play in developing businesses to access these urban material banks through ‘urban mining’. The private sector should develop the businesses harnessing the technologies to extract these materials, and establish platforms to aggregate supply and demand in order to create a safe, reliable and predictable flow of materials for professional and private customers alike. While builders and developers are currently still hesitant to use secondary materials, citing higher risks and difficulties in insuring their projects, the policy landscape is changing rapidly, potentially creating a more profitable secondary material market rewarding businesses prepared for the transition.

The **public sector** has an important role to play in creating the supporting infrastructure required on a municipal and regional level, including waste processing and storage infrastructure available at local and regional scales to limit the transportation factor in the cost structure for secondary materials. It also has a critical role in creating a supportive policy environment that mandates the generation of data through reporting requirements regarding all phases of the building lifecycle.

Even in front-running countries, such as the Netherlands or France, where many of the required elements to create markets for secondary materials exist, the size of the secondary markets are still insignificant in comparison to markets for virgin materials. We are calling for blueprint project ideas that:

- **Significantly increase the demand for recovered building materials.**

  This includes policy templates, strategies or other proposals that increase the demand for secondary products and materials.

- **Connect the supply (of reused and recycled materials) with demand at scale.**

  This might include solutions that increase the predictability, transparency or volume of secondary material flows. For example, this could be a standardised process and framework for communication between demolition companies and circular building material markets or a platform that facilitates exchanges.

- **Strengthen the role of the public sector in facilitating material salvage and reuse.**

  This could include a standardised circular procurement framework, a circular area-development plan template or a guideline to mainstream the inclusion of circular criteria in land-use planning.

To submit a blueprint project, see:
www.circularbuildingscoalition.org/open-call
Therefore, to accelerate the transition towards a circular built environment, we are calling for blueprint projects that:

- **Demonstrate the value of new business and/or ownership models** such as Product-as-a-Service (PaaS) in new cases. For example, the demonstration of PaaS in different building layers, development models, building typologies, or geographies, perhaps by means of a business model template.

- **Facilitates the wider adoption of business models aligned with circular principles, for example by improving enabling conditions.** This could include standardised PaaS procurement frameworks, standardised legal templates for PaaS agreements, financial models for circular business models, or templates for facilitative policy and regulation.

- **Encourages new forms of collaboration.** This could include network/matchmaking facilities, or new governance models that encourage collaboration.

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3. Blueprints for new business and ownership models

There is a lack of a track record of financially sustainable ownership models that align the interests of investors, building users, and developers with long-term climate and circularity goals. In the lion’s share of the construction industry, the ownership of buildings and infrastructure (and the products and materials they are made of) does not lie with the organisation that designed and developed them in the first place. This leads to a split incentive, making circular design difficult and financially less attractive.

There are some ownership models, such as cooperative developments, land trusts, or types of developments, that keep a building asset in perpetuity. Early indicators suggest that such models could overcome the split incentive problem by incentivising a whole-life outlook on the building. These ownership models may pertain to land tenure, entire buildings, and building components/ construction products. In other cases, the implementation of circular economy principles to new business models or building design strategies requires a different configuration of the ownership structures of building layers or during different construction phases. Open building concepts, for example, may contribute to the construction of fundamentally more adaptable and reusable buildings, while in some cases dividing the ownership of a building among owners of building layers. The Product-as-a-Service business model, as another example, reduces maintenance costs and transfer the accountability for the performance of services to service providers, guaranteeing a level of service and reducing operational risks. This model can pose real questions as to who is the right actor (from a business perspective) or legal actor (as prescribed by prevailing rules and regulations) to own building assets, such as a facade in the case of Facade-as-a-Service.⁷

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To submit a blueprint project, see:
www.circularbuildingscoalition.org/open-call
WHY WE NEED TO TRANSITION TO A CIRCULAR BUILT ENVIRONMENT

Globally, the construction sector accounts for approximately one third of total material consumption, contributing to a threefold increase in global material extraction since 1970.

In the EU27+UK, the sector consumes about 1094 Mt (megatonnes) of materials, with the residential sector consuming almost three times the amount consumed by the utility sector.

In the EU, demolition, including renovation, generates roughly 124 Mt of waste a year, which comes close to the weight of one tiny house for every inhabitant in Hungary and Austria.

After this demolition, a huge amount of value is being lost by discarding or low-value recycling of construction materials and products. Furthermore, Western European countries produce 1.5 times as much demolition waste per inhabitant compared to the EU average and more than 3 times as much compared to Central and Eastern Europe or Southern Europe. Much of this could have retained its value when re-used.

Our climate goals cannot be achieved without transforming the construction sector.

The industry contributes approximately 277 Mt (million metric tons) CO2e per year, representing almost 8% of the EU’s annual greenhouse gas (GHG) emissions. We estimate that in a ‘business-as-usual’ scenario, the EU27+UK’s construction sector will exceed its allocated carbon budget for limiting global warming to 1.5°C in 2026. Furthermore, the budget for 1.7°C and 2.0°C will run out in 2029 and 2031 respectively if no action is taken. A few materials have an outsize impact on this: concrete without steel reinforcement bars accounts for 74% of the total mass of resources consumed and is responsible for 36% of all carbon emissions. Steel, with only 3% of the total mass, accounts for 30% of the total impact. Combined, they make up more than 5% of the EU27+UK’s total emissions.
As the sector is implementing the ‘Renovation Wave’, it should ensure this is done using materials with low embodied impacts, such as circular materials.

To achieve climate neutrality in 2050 for use-phase emissions, the EU’s Renovation Wave strategy targets a 3% annual renovation rate. The embodied carbon impacts of these renovations will be increasingly important as the Renovation Wave is being implemented. If current renovation practices in the EU27+UK continue as usual, the energy and non-energy-related renovation activities will consume 918,000 kilotonnes of virgin materials between 2022 and 2050, resulting in the emission of 978 Mt of embedded GHG emissions. In a policy-compliant scenario – i.e. if renovation activities increase in line with the 3% rate – this would increase to approximately 1500 Mt.

Figure 3: Material consumption per geographic region for energy and non-energy-related renovations. All figures are in kilotonnes.

Figure 2: CO₂ budget of the residential and utility construction sector.

EU27+UK’s construction sector will exceed its carbon budget for 1.5°C around 2026
EU27+UK’s construction sector will exceed its carbon budget for 2°C around 2031

Figure 2: CO₂ budget of the residential and utility construction sector.
In the EU, transitioning to the decarbonisation of the built environment. Circular principles is an important pathway towards resource use and waste. The implementation of value for as long as possible, while minimising virgin value by keeping existing resources at their highest planetary boundaries, and creating new forms of value.

At its core, a circular economy has two objectives: economic, environmental and societal benefits.

Adopting circular economy principles in the built environment represents a transformative approach to resource management that can generate economic, environmental and societal benefits.

A building developed according to circular principles optimises the use of resources while minimising waste and impact throughout its multiple life cycles.

For all actors in the construction industry, implementing circular principles can increase resource productivity, asset utilisation and value.

Environmental benefits: If the EU27+UK’s construction industry were to become ‘zero-waste’ while current demand remained unchanged, secondary materials could replace up to 12% of virgin materials (in an ideal scenario). Circular interventions such as optimising resource use by utilising the existing building stock through maintenance and retrofittting would further reduce virgin material demand.

Economic benefits: In the EU, transitioning to a circular economy could generate a net economic gain of €1.8 trillion per year and an increase of up to 7% in the region’s GDP, made possible through the improvement of resource productivity (of about 3%), which would generate cost savings as high as €600 billion a year and an additional €1.2 trillion in other benefits.

Societal benefits: Applying circular principles in the construction sector will demand a new approach to building and deconstruction and could create new job opportunities, strengthening local labour markets.

This includes setting standards for measuring and reducing virgin material use, and reducing waste and embodied carbon impact. Stakeholders in the construction industry who anticipate these changes by adopting circular principles will be well-positioned to lead resilient organisations. They also reduce the risks to their businesses associated with the transition. While this policy transition is happening at different speeds in European countries, at EU level the following forthcoming changes will be important to anticipate:

EU regulation is defining whether a building can be considered sustainable and contributory to the transition towards a circular economy.

The EU Taxonomy has prepared technical screening criteria (now under consultation) which include a limit on the maximum share of virgin materials in the construction of the building for it to be considered compliant. Adopting circular principles is one way to access financial flows aimed at sustainable activities.

Energy prices are volatile and impact the cost of construction products dependent on energy-intensive processes. In 2022, energy prices soared as a result of the war in Ukraine and ensuing trade embargos.

This led to an increase in the once-stable prices of concrete, cement and bricks, because the production processes of these materials are energy intensive. Higher transport costs drove the prices up even further. Even though the direct impact of this war may prove to be transitory, it illustrates the risk of the construction industry’s reliance on energy-intensive products. Well-functioning and stable markets for secondary materials could take some of the pressure off these markets by enlarging the pool with materials that are less exposed to such energy price risks.

The cost of energy-intensive processes may further be impacted by the cost of carbon, which reached a historic high of €100 per tonne in February 2022 (up 150% from a year before), and is expected to rise further, as the EU will continue to reduce the yearly supply of emission allowances. The EU Emissions Trading System (EU ETS) currently covers industrial sectors producing construction materials, and a new EU ETS for buildings and road transport fuels will be established by the European Commission (EC). By implementing circular economy principles, construction companies can mitigate these risks by reducing their dependence on energy-intensive materials.

Markets for construction materials can change rapidly as a result of upcoming regulations. For example, the production of synthetic gypsum (FGD gypsum), now being used in 30% of plasterboard, is expected to drop from 15 million tonnes per year in 2010 to 5 million tonnes per year in 2050, as this material is produced as a by-product of the operation of coal-fired power plants, which are set to close. This seven-billion-euro industry needs to transition, and is already looking ahead and investigating how it can do so. Furthermore, changes to European legislation, such as the Energy Performance of Buildings Directive (EPBD) text adopted in March 2023, incorporate a requirement to calculate the life-cycle Global Warming Potential (GWP) of new buildings, including embodied carbon, which will be an avenue to start including maximum embodied carbon targets. In addition, the Construction Product Regulation (CPR) and the Extended Producer Responsibility (EPR) could address some of the issues regarding transparency, safety and quality. All these changes are likely to create more favourable market conditions for secondary materials. Adopting circular economy principles can enable construction companies to adapt to these changing markets and regulations more effectively.
REFERENCES


2. For more detail, see Buildings as Material Banks, https://www.bamb2020.eu/

3. Examples include Rotor DC (Belgium), New Horizon (Netherlands) and Restado (Germany).

4. For more detail, see https://www.circle-economy.com/resources/facade-as-a-service

5. While yearly emissions from construction might decline for various reasons, such as the further decarbonisation of the industry that produces construction products, and declining population growth reducing demand for new construction, it is still evident that with the current trend of annual emissions, the CO2 budget will run out very soon.


We invite industry frontrunners to share their ideas on how to overcome existing barriers to scale or create demand for their solutions that accelerate the transition to a circular built environment. This paper outlines what types of initiatives we are looking for.

To apply follow the link below.

www.circularbuildingscoalition.org/open-call