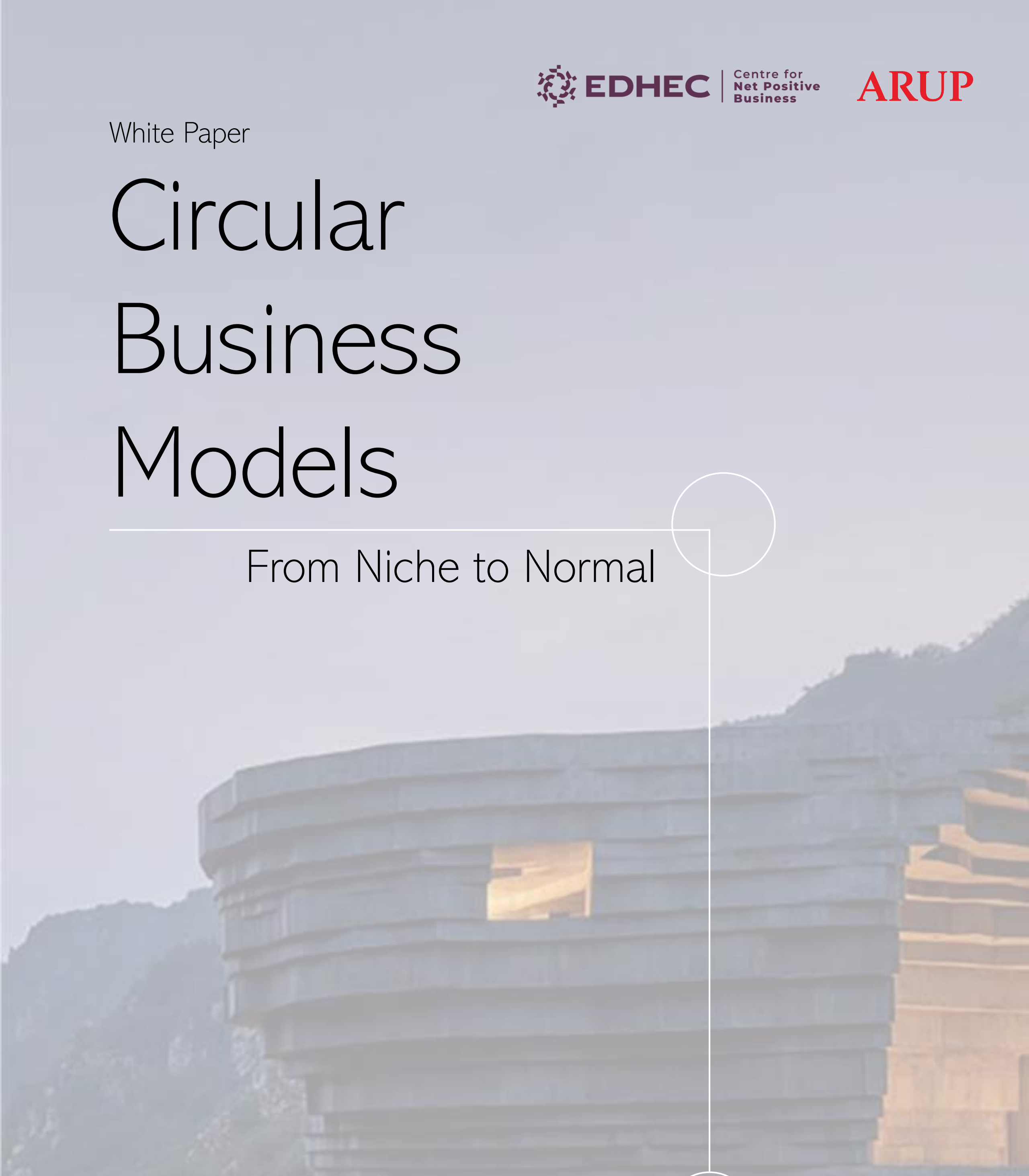
EDHEC | Centre for Net Positive Business

ARUP

White Paper

Circular Business Models

From Niche to Normal



NOV
2025

About the

Regenerative Built Environment Programme

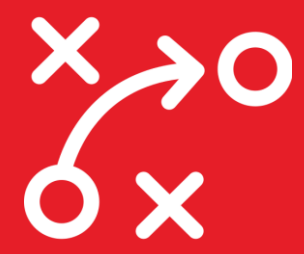
We are the largest market-led initiative to develop new business and drive net positive impact across the value chain

The **Circular Leaders Group** supports this shared effort, reinforcing our position as the largest market-led initiative to develop new business and drive net-positive impact across the value chain.

Together with our partner network, we work

across 3 Strategic Playing Fields:

1. Retrofit at scale
2. Circularity across the value chain
3. Digitalisation of built futures



Based on Co-creation

Working together across the built environment value chain, including material suppliers, manufacturers, technology providers, designers, service providers, investors, public authorities and platform operators.

Focus on 3-5 year Horizons

We focus on strategic opportunities that balance urgency for action with the time needed to develop, test and scale systemic solutions.

This paper is produced for EDHEC's *Future Of* participants to introduce circular business models in alignment with the November 2025 workshop dedicated to this topic.

This white paper explores how circular business models can be a strategy to enhance the competitiveness, resilience and sustainability of built environment industry players. Over 70% of manufacturer executives recently surveyed in a World Economic Forum study believe circular business models will boost their revenues by 2027, with 65% believing their business resilience will also be improved (sector agnostic).[1] Although the transition to circularity presents challenges, such as significant upfront investment, there is a clear and growing imperative for businesses to prioritise the adoption of circular business models.

How mature is your CBM?

Executive Summary and Introduction

Scaling Circular Business Models (CBMs) requires systemic innovation and a shift in mindset regarding how we do business. Scaling involves adaptation, economic transformation, and diversification instead of simple reproducing existing models on a greater scale. Transitioning to these models is no longer a sustainability strategy – it is a business resilience strategy.

The built environment sector stands at a pivotal moment in the face of polycrisis and growing demand for circular and resource-efficient solutions. Long reliant on linear models of extraction, construction, and disposal, the industry is now embracing circularity – not just in isolated pilot projects, but increasingly at scale. This shift is driven by urgent climate imperatives, resource scarcity and rising extraction costs, and the growing recognition that circularity offers both environmental and economic resilience.

Circular principles such as designing for disassembly, reusing materials and extending asset lifecycles are being embedded across the value chain, from architecture and engineering to construction and urban planning. Companies like Wienerberger, a leading European manufacturer of clay building materials, are adopting CBMs to decarbonise while minimising supply chain risks (see the case study on page 6). At the systemic level, frameworks from the Ellen MacArthur Foundation, World Green Building Council, and European Investment Bank are guiding industry-wide transformation.

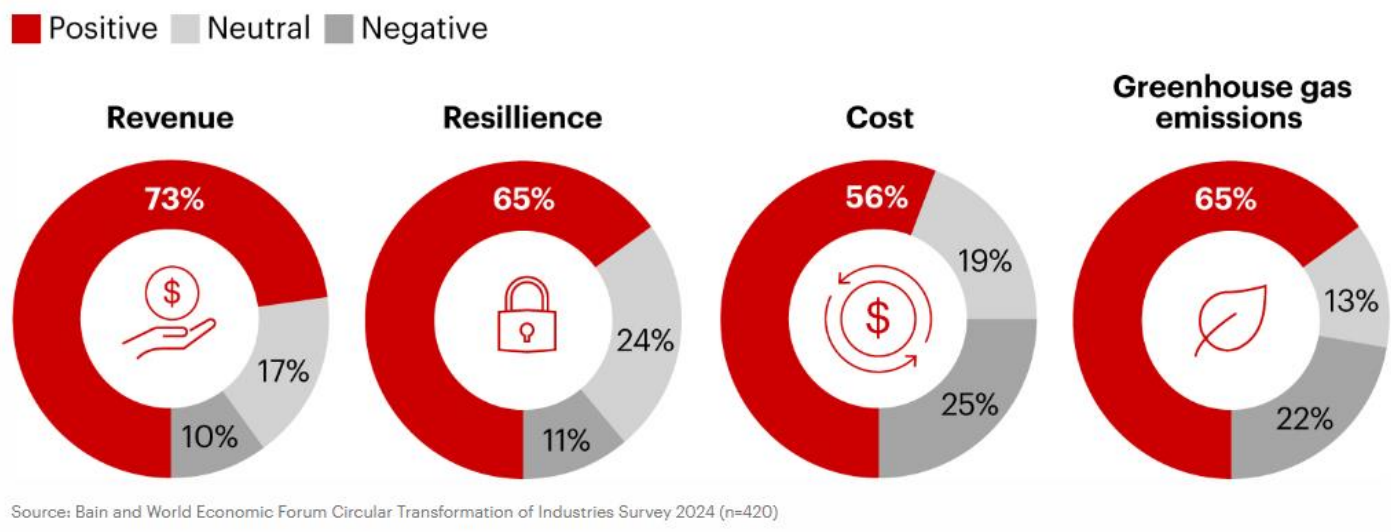
This white paper explores how the built environment sector is moving beyond experimentation to mainstream adoption of CBMs. It examines the technological, financial, regulatory, and cultural conditions that are accelerating this shift, and highlights the opportunities for stakeholders to lead in shaping a regenerative future.

What is a circular business model?

A business model that is designed to keep products, components, and materials in use for as long as possible, reducing waste and resource dependency. It does this by rethinking design, extending product lifecycles, and recovering value at end of life. Core strategies include reusing and recycling resources, prolonging product life through maintenance and refurbishment, and enabling shared use. These models go beyond waste reduction as they transform how businesses create, deliver, and capture value across the entire system.

Businesses anticipate that circular strategies will generate benefits beyond economic gains

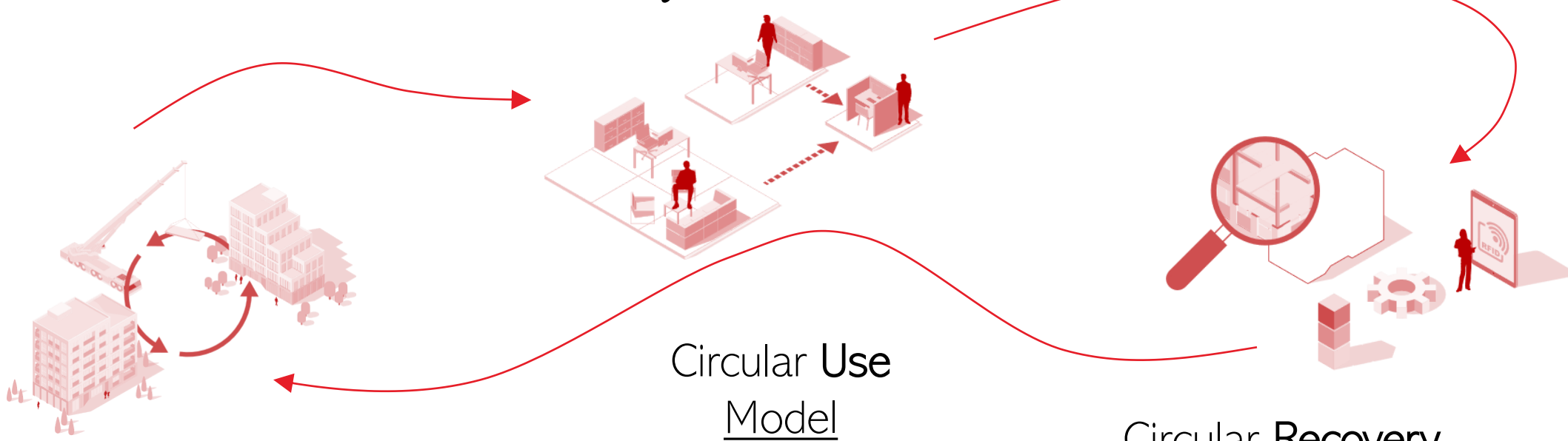
Percentages of businesses globally engaging in circularity that expect a positive / neutral / negative impact three years from 2027 [2]



Source: Bain and World Economic Forum Circular Transformation of Industries Survey 2024 (n=420)

Circular Business Model Archetypes

What does a CBM look like? There are several business model archetypes that the built environment can leverage to deliver great value for people and planet. Below are three such archetypes that are based on the *ReSOLVE* Framework and *Circular Buildings Toolkit* framework. Although defined separately, they would ideally interact and evolve together, supporting the development of broader circular ecosystems.



	Circular **Design** Model	Circular **Use** Model	Circular **Recovery** Model
Features	• Product and process design for circularity from first principles • Circular supply of materials and resources	• Sharing platforms, product-as-a-service • Lifetime extensions • Sell and buy-back schemes • Tracking facilities and services	• Support lifecycle - services • Recovery providers • Refurbishment and maintenance • Recycling facilities and services
Benefits	• Reduces material consumption, costs, energy and emissions • Collaboration is facilitated across the value and lifecycle chain	• Unlocks new business models; sharing, servitisation, digital platforms • New services and income streams increase revenue	• Value is created from waste, enabling new revenue streams • Strong job creation potential in recovery, reuse, and recycling
Challenges	• Requires collaboration, investment and market acceptance of reused materials • Limited data on lifespan and OPEX	• Ongoing payments shift CAPEX, OPEX and tax impacts • Long payback needs new financing • Consumer demands may limit uptake	• Lack of regulation hinder accountability • Infrastructure needs investment • Design and disassembly quality affect reuse potential

Global Disruptive Triggers Driving CBMs

Global disruptive triggers are influencing how companies adopt and scale CBMs. This is shifting the focus from isolated pilot projects to integrated strategies that drive system-wide and international adoption. As these innovations intersect, they create new pathways for scaling impact across the built environment and support the transition toward a global dynamic.

Siemens Mobility's Railigent-X AI platform boosts fleet performance and cuts maintenance costs by up to 15%. For buildings, IoT systems provide real-time data to guide operations and reduce costs. [3]

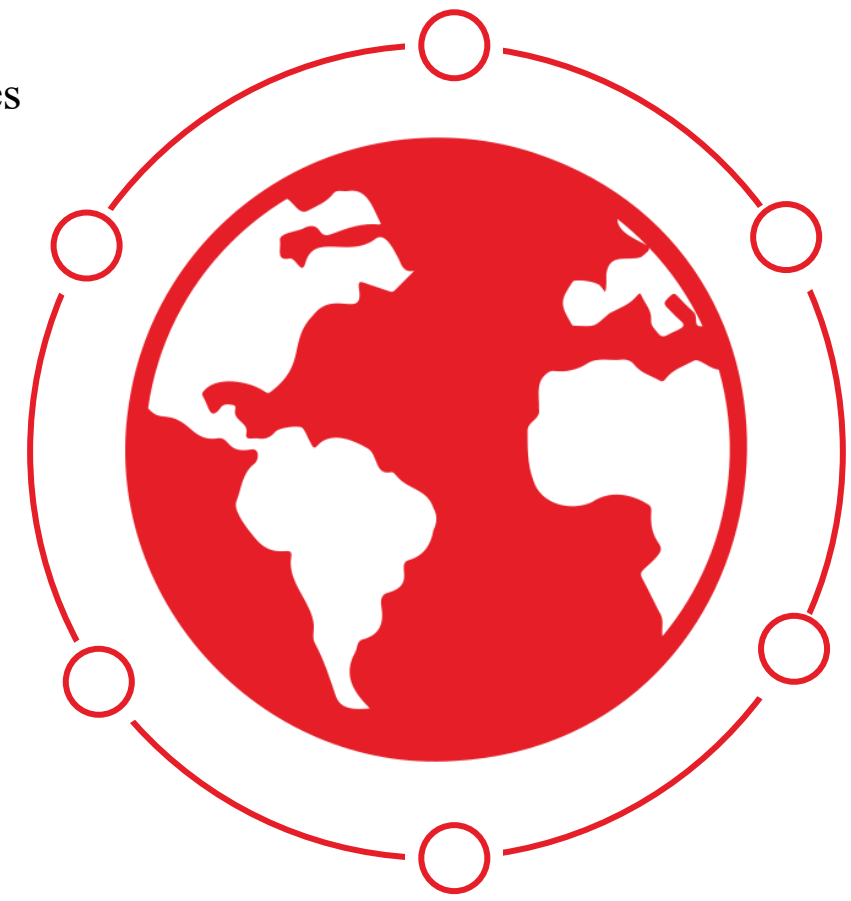
AI, IoT & Predictive Technologies

Internet of Things (IoT) combined with blockchain improve supply chain transparency, reduce losses, and support end-of-life recovery. AI and Big Data optimise resource use, predict maintenance, and identify circular opportunities.

CircoTrade is a B2B platform for listing, valuing, and trading reclaimed building components via futures contracts, easing reuse barriers and boosting secondary material adoption. [4]

Catalysts for Scaling Circular Solutions

Finance, tech, and enabling policies are accelerating circular adoption by making models scalable, investable, and operationally viable.



Resource Scarcity & Policy Leading to Urban Mining

Urban mining addresses resource scarcity and policy restrictions on virgin material by recovering materials from existing buildings and infrastructure. This transforms waste into resources, moving away from extractive models.

Product Innovation

Bio-based materials and circular design are reshaping products, enabling regenerative models and disrupting linear production.

Shifting ownership models

Ownership models are shifting toward usage-based and long-term stewardship.

The CIRCBUILT project develops scalable bio-based construction products from agricultural and forestry waste, showing circular innovation meets standards and lowers impact. [5]

Policy Pressure

Governments and institutions are introducing circular procurement, carbon accounting, and material passports to mainstream adoption (EU Circularity Guide).

Schüco's circular façade systems enable reuse and disassembly, shifting from one-time ownership to long-term stewardship through material-as-a-service models. [6]

Case Studies and Best Practice

Wienerberger [9]

About

A reused brick made from salvaged materials was developed to cut nearly 27.7 kg of CO_2 / m². It's designed for disassembly and reuse, already used in a Stuttgart bus depot, and meets EU circular construction targets.

Success

Outperformed timber in environmental impact, won the German Sustainability Prize 2025 award as well as being backed by a reuse and recovery system.

Failure / barriers

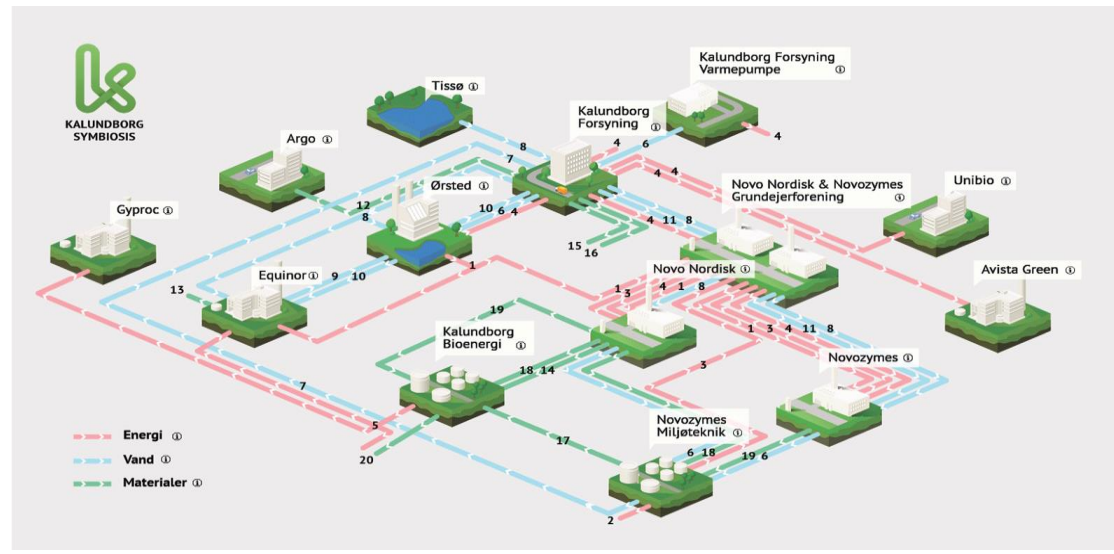
Existing business model lacked the capabilities to manage reverse logistics, material traceability, and service-based offerings.

Transition points

Supply chain shocks and EU policy shifts triggered a pivot from product sales to service-oriented, circular strategies. This required new digital tools and ecosystem partnerships.

Context specific elements

The business model shifted from selling bricks to offering a reusable façade solution. Bricks were designed for disassembly and tracked digitally across life cycles. A partner network was built to handle reverse logistics and refurbishment. Internal teams co-developed the model through workshops and market testing, aligning with EU circularity targets and client demand for low-carbon, service-based offerings.



Kalundborg Systems [10]

About

Several companies* and the local government in Kalundborg, Denmark, work together to exchange water, steam, and energy, which helps save resources and reduce CO_2 by over 635,000 tons annually (*Novo Nordisk, Novozymes, Equinor, Gyproc Saint-Gobain.) [11]

Success

Kalundborg conserves 4 million m³ of groundwater, recycles 62,000 tonnes of materials, cuts 586,000 tons of CO_2 annually, and uses surplus industrial heat to supply district heating for over 40,000 households. The symbiosis is internationally recognized as a benchmark by the Ellen MacArthur Foundation. [12]

Failure / barriers

Kalundborg faces barriers including regulatory misalignment, lack of circular infrastructure, and economic viability constraints that end collaborations when profitability declines.

Transition points

Water scarcity in Kalundborg triggered the initial industrial collaboration in 1961 and the symbiotic exchange in 1972. Formalized as a non-profit in 1996 with board members from each partner, enabling strategic governance. [13]

Context specific elements

Kalundborg's CBM is anchored in a locally embedded culture of trust and non-competitive collaboration, where companies proactively consider the impact of their decisions on symbiotic partners. [13] This is enabled by a governance structure involving 17 public and private entities, including the municipality, which acts as a facilitator. [11]

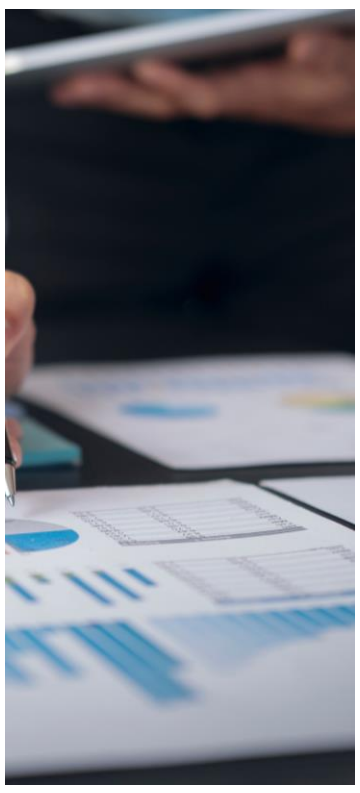
Barriers for CBMs

These barriers relating to regulations, finance, and stakeholder engagement frequently slow or deter the implementation and scaling of circular models.

1. Economic Rationale and Communicating Value

CBMs can deliver great value for companies through new value streams or strengthening brands, for example. However, CBMs do not have appropriate narratives that convey the full economic rationale of the business model, hindering internal buy in and access to resources needed to scale. This economic rational is vital, particularly as high upfront investments and ongoing costs are cited by 65% of businesses as a key barrier. Many circular initiatives also struggle because financial frameworks fail to reflect the diverse and often indirect benefits (e.g., climate resilience, improved urban productivity) and the longer / different timescales that value is created over. [1]

Innovative financial strategies, such as blended finance models, are necessary to bridge financing gaps, reduce risk, and attract private capital to nature-positive, circular solutions. Investors must integrate circular economy principles and natural capital considerations into their decision-making processes, particularly using frameworks like the Taskforce on Nature-related Financial Disclosures (TNFD).



2. Regulation and Policy

The lack of regulatory alignment and limited access to recycled materials are obstacles cited by 60% of businesses. Current building codes and urban planning policies often pose substantial barriers to innovative construction methods and low-impact material use. For example, policy changes are needed to facilitate the widespread uptake of Relocatable Buildings by simplifying processes for temporary planning applications and operating licenses.[1]

3. Organisation Culture Change and Management

Organisational transformation, including change management processes, development of capabilities and staff engagement, may be required to deliver CBMs. Working through these changes takes time, and often CBMs and the associated organisational changes required are under pressure from short term timescales to assess returns on investment. Friction in change management processes and cultures of risk aversion can set CBMs up to fail before they have had a chance to deliver positive impact.

4. Technology and Infrastructure

CBMs frequently encounter challenges concerning the digital and physical infrastructure needed to facilitate the monitoring of material for recycle and reuse. This is caused by the limitations of current technologies and the absence of scalable technologies for reverse logistics and deconstruction. To improve these technologies the integration of BIM, Internet of Things and material passports needs to be improved. [12]

Building Blocks for Scaling CBMs

A clear understanding of value propositions, creation, delivery, and capture forms the foundation for the 5 building blocks required to scale CBMs.

Adaptability to Feedback and Environmental Changes

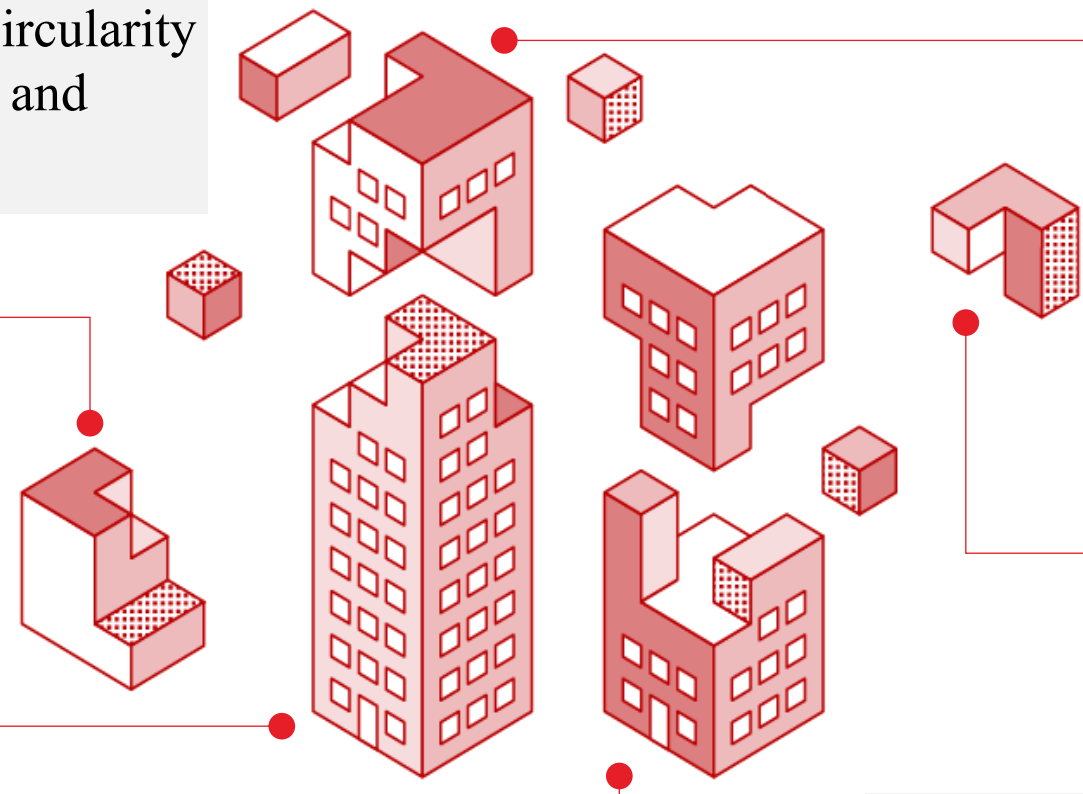
CBMs often depend on the context-specific adaptation and by responding to how circularity reshapes value creation and competitive dynamics.

1

Platform Thinking and Stakeholder Engagement

Enable circular models by maximising asset use, facilitating material value exchange, and supporting ecosystem coordination for transparency and value retention.

2



3

Enabling Technologies

Digital enablers such as AI, IoT, Digital Twins, and blockchain support transparency, traceability, and real-time decision-making through tools like material passports and flow monitoring. Even in low-tech settings, clear visuals and trusted data are vital to understand performance.

4

Blended Finance

Together with partnerships this can help to unlock funding from public grants, private capital, and green finance. Public-Private Partnerships (PPPs) and strategic coalitions ensure risk-sharing, integrated urban development, and early partner inclusion.

5

Impact Metrics

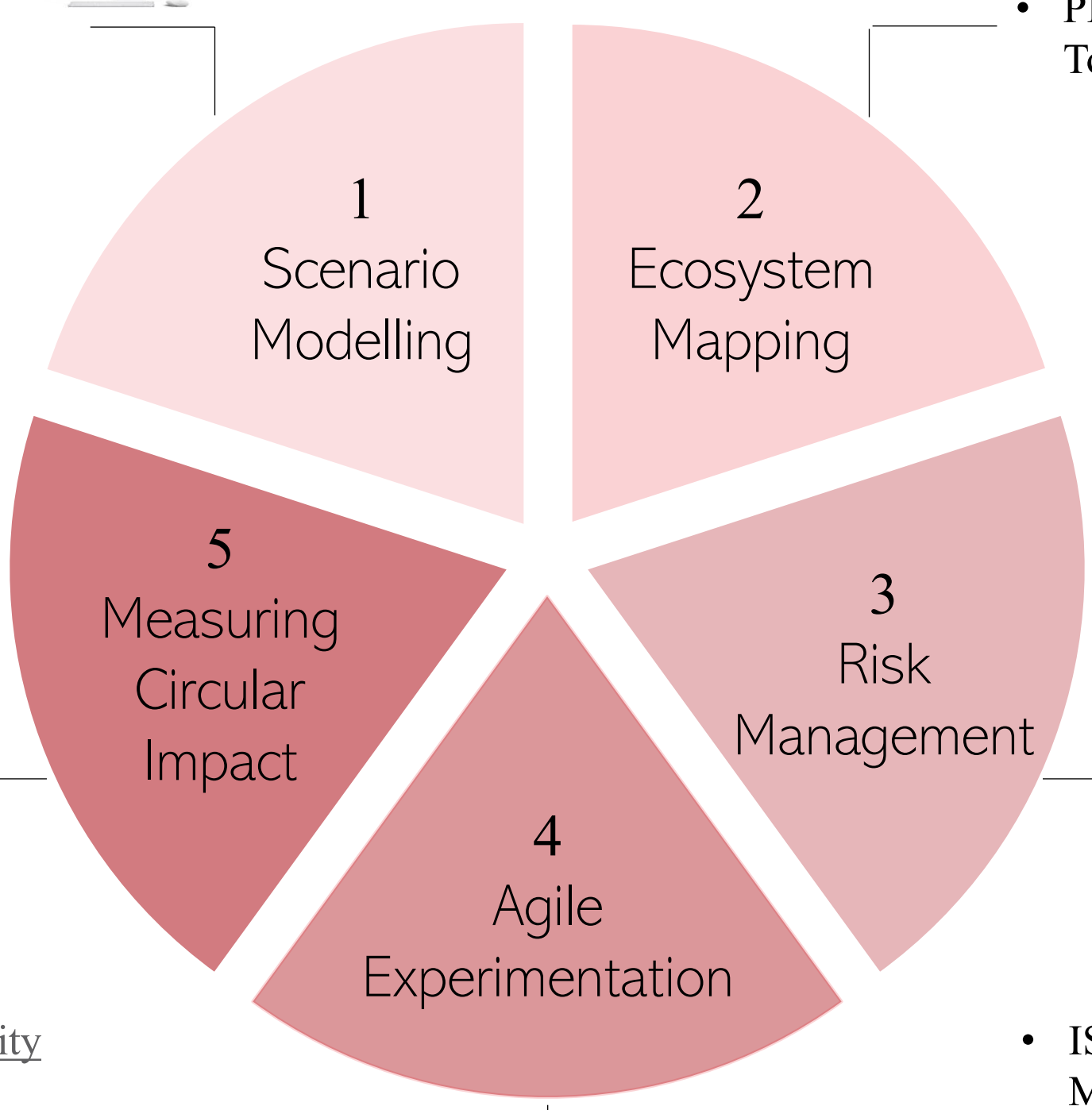
Such metrics must go beyond waste reduction to capture resilience, brand value, and environmental benefits. New tools should measure lost value from externalities and guide investors toward projects that restore natural systems, while financial metrics and blended finance strengthen credibility and internal buy-in.

Tools and Playbooks for Breakthrough Scaling

There are multiple tools and resources to support you in scaling your CBM and unlocking circular value, starting with those proposed below.

- Circular Buildings Toolkit
- Three Horizons Framework

- SWOT
- PESTLE Analysis Tools



- Material Circularity Indicator
- LCA

- SCRUM Guidelines

- ISO 31000 Risk Management Frame-work

Explore all tools through the provided links!

1. Strategic foresight helps organisations anticipate changes in stakeholder behavior, technology, and regulations by applying methods like horizon scanning, visioning workshops, and scenario planning.

2. & 3. Ecosystem mapping and risk management support the stakeholder alignment needed to scale circularity beyond pilots by identifying strengths, vulnerabilities, and preparing for disruptions.

4. Agile experimentation drives circular innovation through living labs and pilot projects that test reuse strategies, asset flows, and collaboration, with regular team reviews to continuously improve CMBs.

5. Structured measurement tools help track circular progress by assessing reuse, circularity, and environmental impact, while consistent metrics aligned with policy goals enable scalable and long-term circular value.

Conclusion

Europe's Built Environment sector must adopt circular business models to stay competitive and meet climate goals.

The construction sector alone is responsible for nearly 40% of Europe's total carbon emissions, and around 30% of these come from the materials used. CBMs focused on reuse, refurbishment, and material recovery can directly reduce this impact. Analyses show that adopting circular practices could cut embodied carbon by up to 13% by 2030, and as much as 75% by 2050, while also lowering costs and creating new revenue streams. [13] To capture this potential, industry leaders and policymakers must act now to integrate circular business models into every stage of the construction value chain.

The time to act is now.

Businesses should move away from running circular pilots in isolation. Instead, they should map the required capabilities, capacity, and organisational structure needed for the CBM to be fully integrated and scaled. A successful transition to a circular economy requires shared governance, equitable access to opportunity, and leadership that facilitates collaboration across teams and sectors. CBMs can only scale if leaders align incentives, budgets, and KPIs around collective impact, ensuring a "just transition". To turn these principles into action, start by reflecting on your organisation's readiness and approach to circularity.

1. How ready are you and your organisation to scale circular business models?
2. What new forms of collaboration or leadership would you embrace to make circularity real?
3. How can your circular initiatives deliver impact beyond financial growth?

Activity: In addition to the questions above, reflect on the curve below, and mark where you currently are for your business model.

The *tipping point* is when circular business models shift from small pilots to widespread adoption.

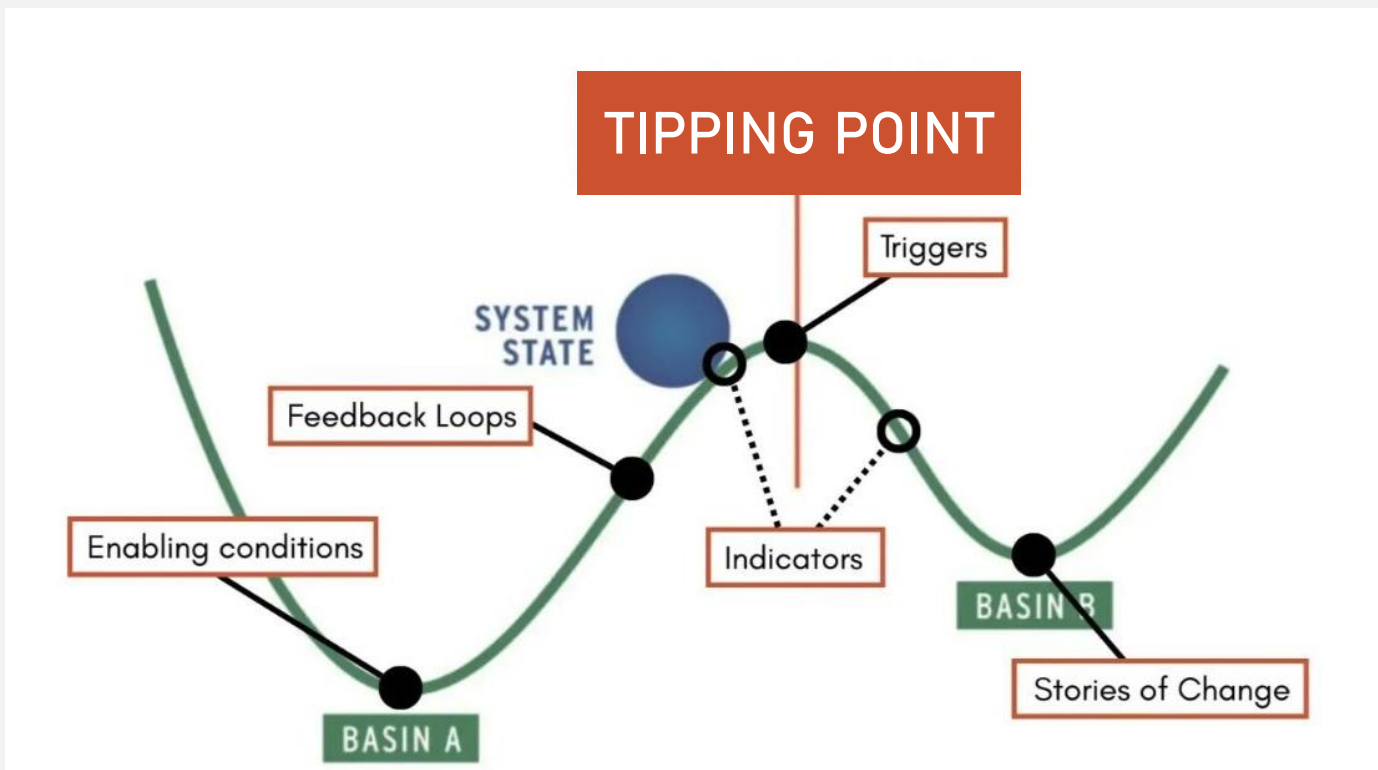


Illustration by Andrew Bernier, adapted from Walker, B. & Salt, D. (2006) *Resilience Thinking: Sustaining Ecosystems and People in a Changing World.* Island Press: Washington, DC.

Workshop Participant Testimonials

Laura Nessi (Somfy): “The pilot purgatory really caught my eye… we are launching more and more initiatives on the small and local scale. The very next objective for us will be to scale. And to scale, I understood that partnership is key.”

Gitte Tang Kristensen (Danfoss): “What I’m very happy about is the engagement and the motivation that we see here” … “I think it’s important that we use this drive and this sense of urgency that we feel, partner up and actually get to action.”

Marie Lamblet (Saint Gobain): “To feel the energy to all the stakeholders and circular players”… “We are all facing the difficulty of a financing scheme, because today we are in a linear economy. On top of that, we need collaboration – alone, we cannot make this happen, and we need to rethink the way we interact” … “We need, from an advocacy point of view, all of the ecosystem to follow.”

Mona Delluc (Holcim): “We have a large representation of companies across the value chain, and we’re all talking about circularity” … “In terms of readiness, it seems like many companies are ready and even structured around that”… “When it comes to scaling up, it seems we all have the same question mark, and there’s not just one answer to that”… “We always here that it’s a business case, and a financial way to be viable, but it’s more than that, and it’s about political will and will in general. This is where it all falls down to regulations willing to push changes in that direction, and these seem to be the only thing that can do so durably.”

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