



Sustainable and Circular Construction

Roadmap report

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Introduction

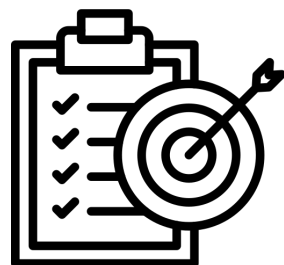


Aalto University
Startup Center

www.d2xcel.eu

Introduction and objectives of the Roadmap report

This report was developed as part of a broader initiative to identify and capitalize on market opportunities within the **Sustainable and Circular Construction** sector. The report serves as a guide that maps out the market potential, challenges, and strategic actions necessary for the successful scaling of businesses in this sector.



The primary goal of the Sustainable and Circular Construction Roadmap Report is to equip companies and stakeholders within the construction industry with the knowledge and tools needed to navigate the **transition towards sustainable and circular practices**.



Main function of the report is to highlight opportunities that the participating startups may have not recognised. It provides a structured approach to understanding market dynamics, customer needs, and emerging trends, thereby helping businesses position themselves effectively in the evolving marketplace.

Overview of the Participants

Ventures



Recoma saves waste that nobody else can or wants to recycle, and gives it new life as an innovative, sustainable building product in the circular economy



Skanio - Transforming the building & elevator survey process by creating a European digital service.



Soletairpower manufactures carbon dioxide capture systems retrofittable with buildings.



Minimum energy - Automized energy and decarbonization planning



ParaStruct develops circular materials, processes and applications, which enable processing of otherwise unusable mineral and biogenic wastes into circular building components.



Following the evaluations by the selection panel, 10 of the most promising European ventures in **Sustainable and Circular Construction** were chosen through a competitive process. Companies were selected based on leadership potential, product/technology strength, market opportunity, go-to-market strategy, and business clarity.



Cybe offers the only one-stop-shop and global ecosystem for affordable buildings to live in that are Net Zero, with a Reduced Carbon footprint and Comfortably



Firemesh - Ensuring Property Safety with Firemesh Reliable Sprinkler System Testing



Hydrovolta - Sustainable Water Treatment for a better Future



Ecorbio is a startup focused on designing and developing cleantech solutions to produce high-quality, truly sustainable biochemicals.



FacadeGenius - Collaborative facade design platform for Net Zero Buildings

Market opportunity Stakeholders

European
Innovation
Council



Funded by
the European Union



Market opportunity Mentors

European
Innovation
Council



Funded by
the European Union



Yoad Mick
IMAGYM Training



Hannele Mennala
MovED



Petri Rinne
Coventures



Mateusz Wielopolski
Better Building



Mick Scheinin
MacWell

Methodology

We state here some of the underlying assumptions and 'facts' about the construction industry that serve as the basis and context of this analysis.

- Work in the construction industry is typically labour intensive, but at the same time there is also a lot of technology involved.
- Construction is a 'brownfield' industry, i.e. a sector whose practices have evolved over thousands of years
- Building regulations may vary between countries, but nevertheless the industry is quite regulated, as safety of our dwellings is paramount
- The construction sector is the largest emitter of greenhouse gases, at 37% of global emissions, particularly due to the significant carbon footprint of some of its most used materials, like cement, steel and aluminum.¹

1. United Nations Environment Programme, & Yale Center for Ecosystems + Architecture (2023). *Building Materials and the Climate: Constructing a New Future*. <https://wedocs.unep.org/20.500.11822/43293>.

Methodology

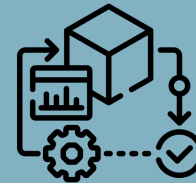
- 6 in-depth interviews were conducted with industry stakeholders to extract expert opinions across the following categories:
 1. Market trends and impact
 2. Competitive advantage and uniqueness (value proposition)
 3. Customer segments and relevance
 4. Channels and delivery
 5. Revenue streams and financial viability
 6. Risks and challenges
 7. Competition
- Surveys: Collected 17 survey responses to validate and quantify the insights gathered from interviews. The survey included 13 structured questions.
- Business Model Analysis: 10 venture business model canvases evaluated to assess strategic approaches and innovation in the sector.
- Validation process involved multiple layers of engagement to ensure the accuracy of the findings. Initially, offline workshop was conducted with the Aalto advisory pool, consisting of business advisors, to gather feedback on the preliminary insights and roadmap format. Additionally, D2XCEL stakeholders were engaged, by providing the feedback on the final version of the report.
- The gathered data was analyzed by focusing on key categories, identifying strategic opportunities and potential barriers. The analysis provided a comprehensive view of the sector, enabling the development of targeted insights for growth and scalability.



6 Stakeholder interviews



17 Survey responses



10 Venture Business Model Canvases analyzed



Validation through stakeholder feedback and offline workshop with advisory pool

Total of 20+ Participants

Results, Insights, Roadmap

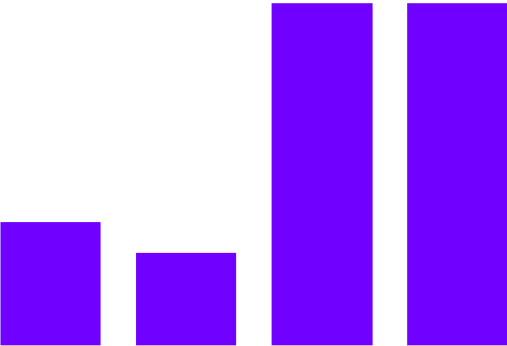
Opportunities, Market trends: Surge in Green Materials and Smart Technologies Driving Sustainable and Circular Construction Growth (1)

Lars Miikki

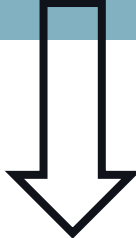
Project Manager at Metropolia University



" Key market trends in the Sustainable and Circular Construction sector include the **increasing demand for low-carbon building materials**, the **shift towards circular economy models**, and **growing regulatory pressures** such as the **EU's Green Deal and CO2 pricing**. Additionally, digitalization trends like **Building Information Modeling (BIM)**, **digital twins**, and **Artificial Intelligence (AI)** are **critical for optimizing material use, lifecycle management, and decision-making**. AI can further enhance predictive maintenance, energy efficiency, and resource allocation. **Startups focusing on innovative materials, circular design, and digital tools—including AI—are well-positioned to thrive in this evolving market.** "

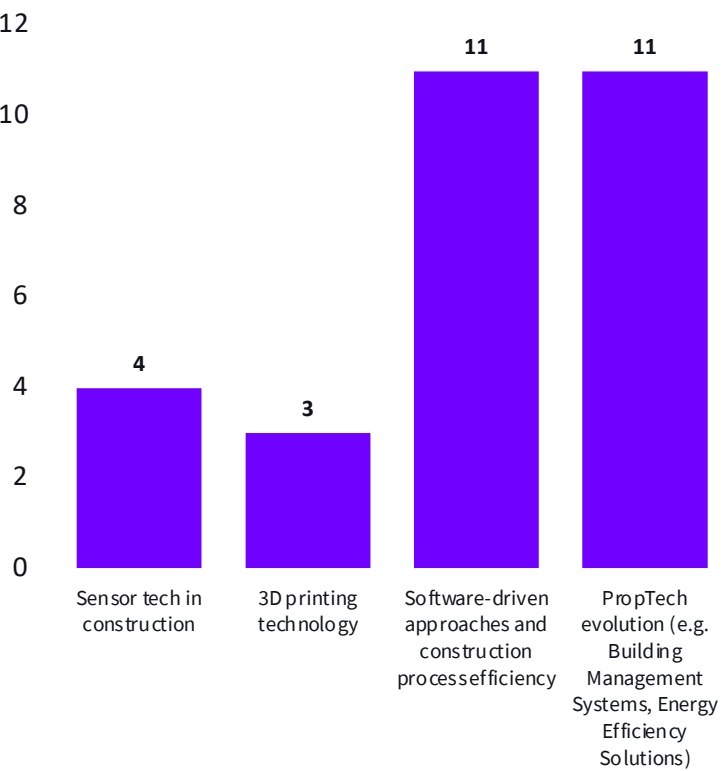


In the Sustainable and Circular Construction sector, the most important market trends are centered around enhancing **construction process efficiency** through **software-driven solutions** and **innovations in PropTech**. Key areas for future growth include **sustainable materials suppliers** and **modular building systems**, both of which are seen as crucial for advancing the sector. Startups with compelling value propositions tend to focus on introducing **new technologies and refined business models** that emphasize sustainability, addressing both **environmental and economic challenges** effectively.

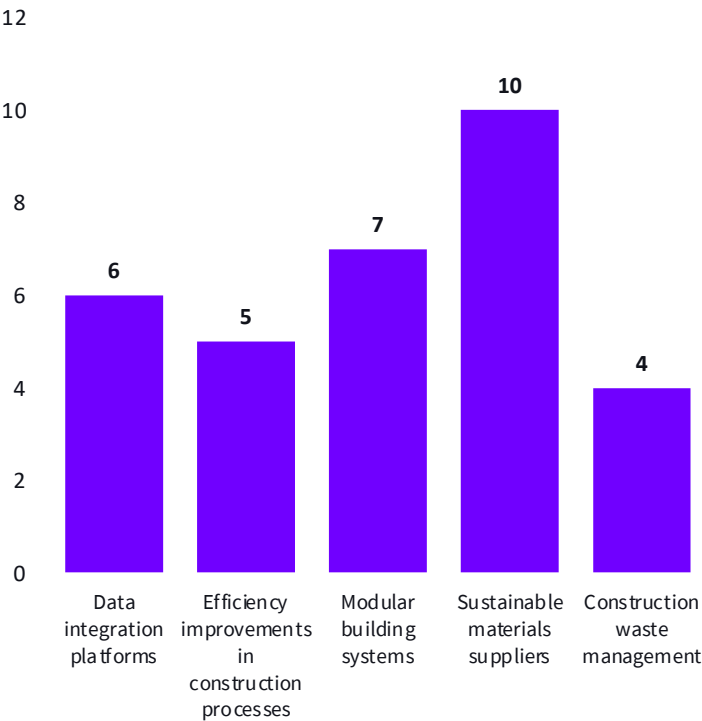


Opportunities, Market trends: Surge in Green Materials and Smart Technologies Driving Sustainable and Circular Construction Growth (2)

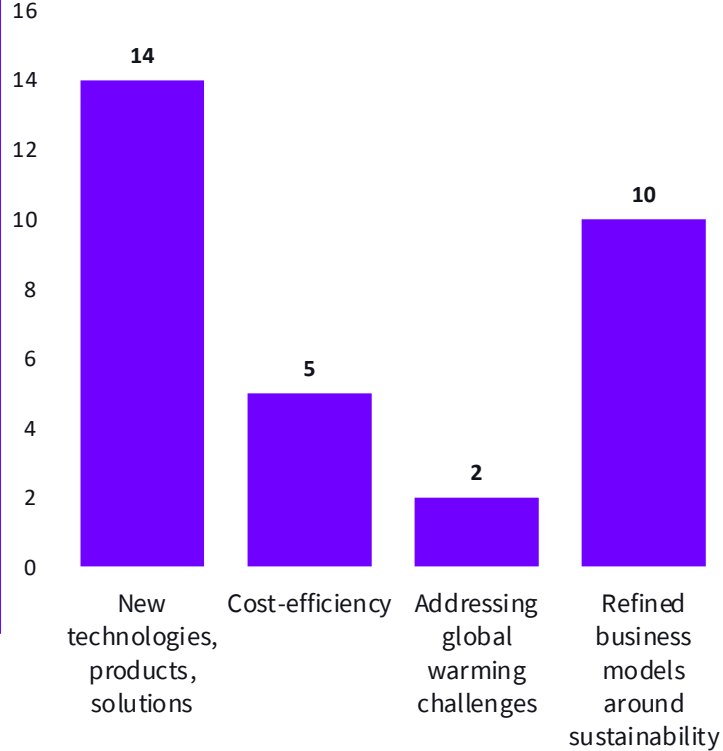
Market trends believed to be **most important** for **startups** in the Sustainable and Circular Construction sector based on survey responses.



Sectors within Sustainable and Circular Construction considered to hold the **most promise** for **future growth** according to survey participants.



Factors that make a startup's **value proposition** unique and compelling in the Sustainable and Circular Construction sector according to the survey.



Technology: AI and Data Integration as Catalysts for Growth

*These **technologies** are expected to transform the construction industry by **improving efficiency, reducing environmental impact**, and enabling the **transition to more sustainable and circular practices***

BIM, IoT, 3D printing, and **low-carbon materials** are considered key technologies, ready for immediate and widespread adoption.

AI, digital twins, modular construction, and **recycling technologies** are recognized as critical for driving long-term innovation and sustainability.

Blockchain, material passports, and **circular economy platforms** are emerging technologies that will play a crucial role in advancing the circularity of construction practices.

Petri Rinne

Entrepreneur at Coventures



*“The sustainable and circular construction sector **urgently needs advanced recycling technologies, low-carbon materials, and efficient resource management tools**. Scalable, modular construction and energy-efficient solutions are also critical to reducing waste and improving sustainability in the industry.”*

Jussi Muurikainen

Founder at Liquido.vc



*“Critical needs include **platforms for integrating diverse data sources** and **tools for improving construction process efficiency**.“*

Scaling: Public Procurement and Digitalization as Key Drivers for Growth in Sustainable and Circular Construction (1)

How to position as a start-up for rapid growth in an industry that is increasingly focused on sustainability and innovation?



Offer **innovative, scalable solutions** with a **focus on sustainability**



Leverage **data-driven technologies** like **IoT** and **AI** to enhance efficiency



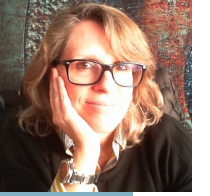
Design products/services with **strong regulatory support**.



Build a strong value proposition, to provide **cost savings**, with **environmental impact**



Form **strategic partnerships**



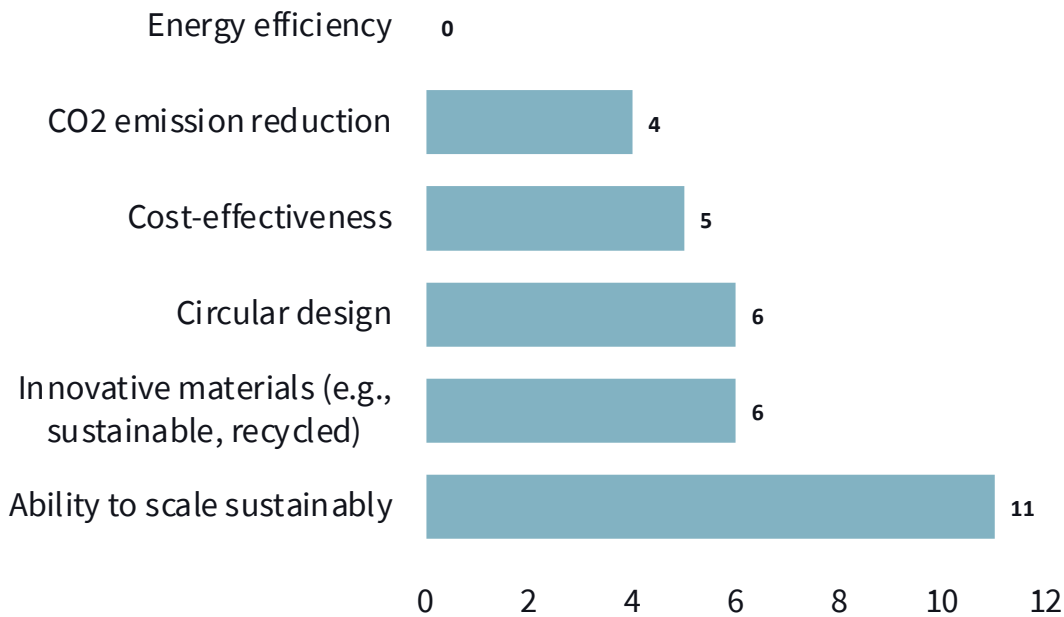
Roberta Gilardi

CEO at G-Gravity

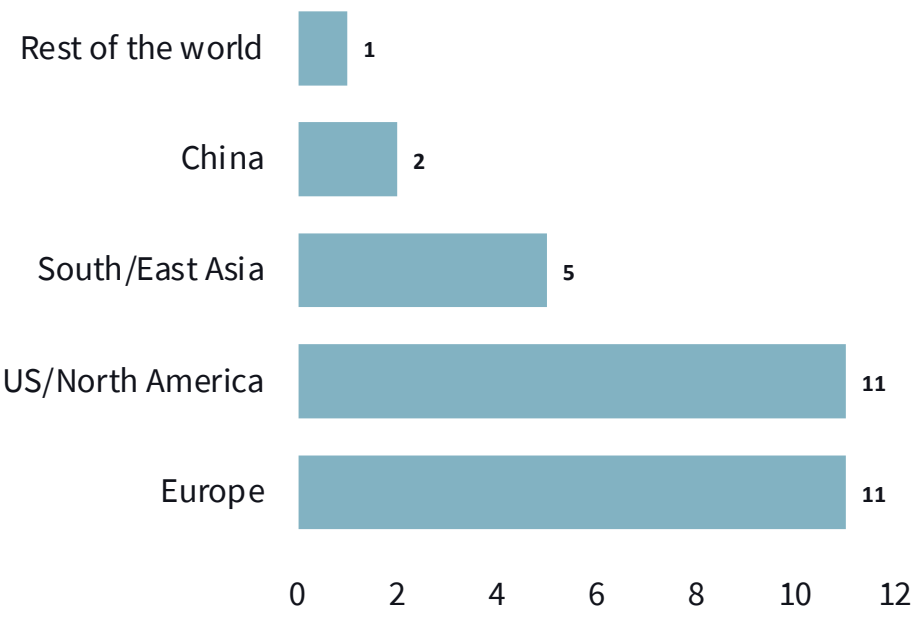
*"The current state of scaling innovation in the sustainable and circular construction sector is **promising but faces several challenges**. On the positive side, there is a **growing demand for sustainable practices**, driven by regulatory pressures, consumer expectations, and a heightened awareness of environmental impact. Innovations in materials, energy efficiency, and modular construction are gaining traction, and circular economy principles—such as recycling building materials and reducing waste—are being increasingly integrated. **To truly scale, the sector needs a robust ecosystem that includes partnerships between public and private sectors**, more accessible financing for green projects, and standardized frameworks for measuring sustainability impact. ... The path to scaling innovation sustainably in construction requires **coordinated effort across stakeholders**. "*

Scaling: Public Procurement and Digitalization as Key Drivers for Growth in Sustainable and Circular Construction (2)

*Attributes or capabilities identified as **indicators** of a **competitive advantage** in the Sustainable and Circular Construction sector.*



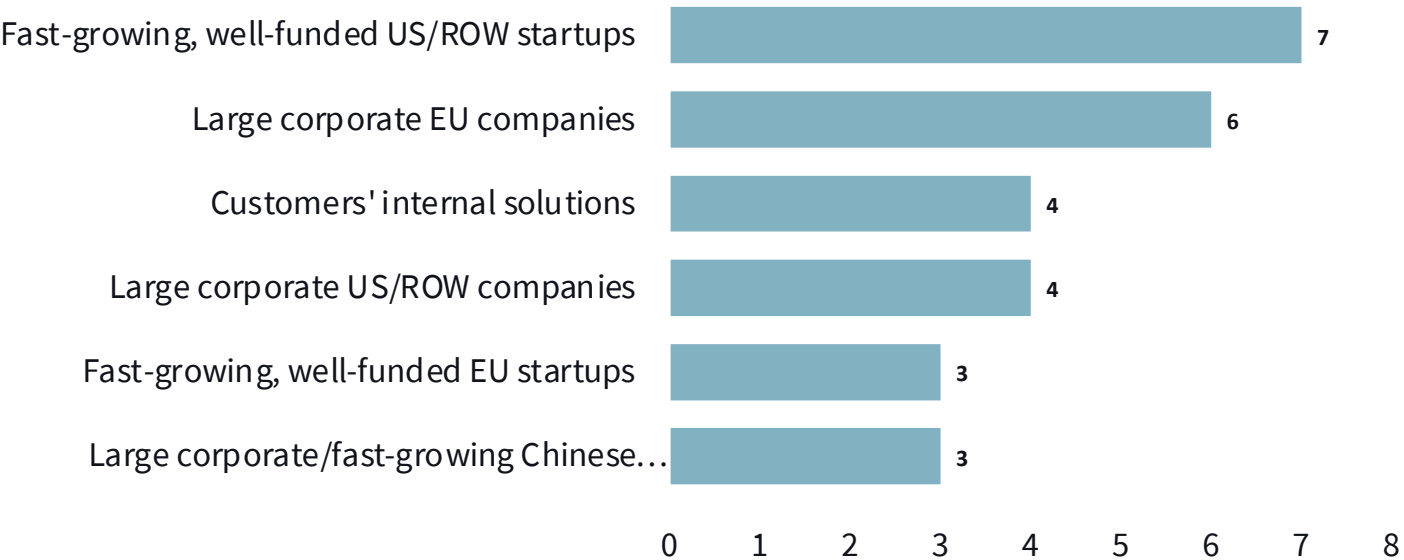
*Geographic markets perceived to offer the **greatest opportunities for growth** in the Sustainable and Circular Construction sector.*



Competition: Construction industry is dominated by large companies

Start-ups face **competition** from various types of organizations in the construction industry. These enjoy many **competitive advantages**, e.g. **large scale, significant resources**, and already **established market position**.

Main competitors for growth companies in the Sustainable and Circular Construction sector according to survey respondents.



Teemu Lehtinen

CEO at Kirahub

“Traditional construction companies that adapt to sustainable practices could become significant competitors in the future.”

Contrasting competitive advantages

Large established companies	Well-funded tech start-ups
<ul style="list-style-type: none">Established market positionFinancial resourcesEconomies of scaleIntegrated supply chainsBrand recognition and trust	<ul style="list-style-type: none">Venture capital fundingInnovative technologyAgility in market adaptationDigital transformation expertiseRapid scaling potential

Challenges for start-ups in Sustainable and Circular construction: Resistance to change

Industry resistance to change is blocking start-up opportunities

Fragmentation and Persistent Conservatism

- ❏ They hinder the adoption of innovations like sustainable materials and circular economy

High Costs and Investment Barriers

- ❏ High upfront costs for sustainable technologies, limited adoption of sustainable solutions

Slow Adoption of Technology

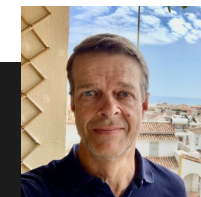
- ❏ An 'industry-wide hesitation' to invest in digital tools like BIM and IoT

Resistance to regulatory and Market Changes

- ❏ Regulatory pressure and growing investor interest in sustainability, but internal resistance to change

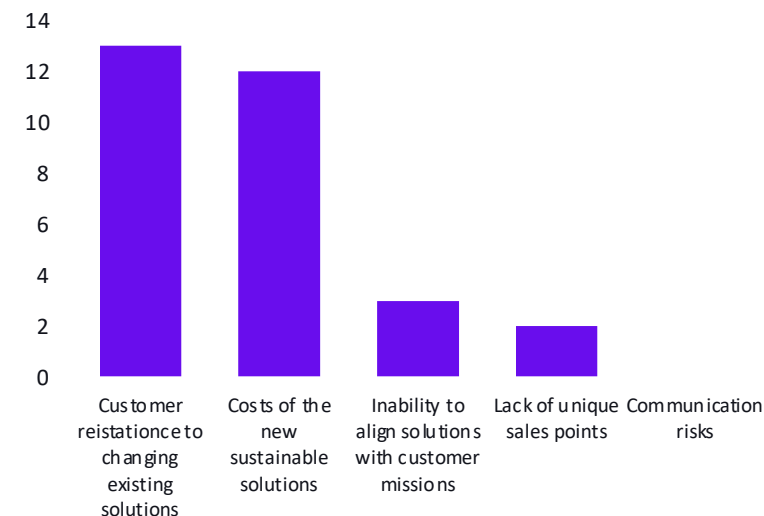
Petri Rinne

Entrepreneur at Coventures








*“Technological and operational **challenges hindering** sustainable and circular construction include design tools, material availability, technology integration, energy efficiency, waste management, cost-benefit analysis, skill gaps, scalability, data collection, and **regulatory barriers**.”*

Key risks that could impact the Sustainable and Circular Construction sector in the next 3-5 years?



Risks for start-ups as they are seeking to bring new technologies into an established sector

Start-ups face several risks in the construction sector, requiring **careful risk management strategies**.

-  High upfront costs and investment barriers
Without sufficient financial resources or investment, start-ups may struggle to scale their operations
-  Regulatory Uncertainty
Changing compliance requirements create challenges for planning and execution
-  Market fragmentation and slow adoption of innovation
Convincing potential customers to adopt new technologies can be a long and resource-intensive process.
-  Supply chain challenges
Disruptions or material shortages can delay projects and increase costs
-  Lack of skilled labour
Shortages in skilled workers hinder start-ups' ability to develop and implement new technologies

Lars Miikki

Project Manager at Metropolia University



“Key risks and challenges in the Sustainable and Circular Construction sector include the **high upfront costs** associated with sustainable materials and technologies, which can limit adoption, **especially for smaller companies**. **Regulatory uncertainty** and constantly evolving **compliance requirements**, both at the national and EU levels, pose significant challenges for long-term planning. Additionally, the **availability of skilled labor** to implement circular practices and new technologies is a growing concern. Lastly, **supply chain disruptions**, particularly for sustainable materials, can hinder project timelines and increase costs..”

Pontus Stråhlman

Partner at Voima Ventures



“**Political risk is a trouble for competition**. Many changes to construction are not only done by consumer demand but even more by political demand. “

Customer segments and distribution channels: Residential and Commercial Markets Drive Demand, Digital Platforms Enhance Material Reuse

The most important customer segments in the construction industry, and their distribution channels are indicative of a well-established sector, with many strategic options open to pursue for start-ups.

Small and Medium-Sized Enterprises (SMEs) in Construction

- Local Partnerships and Resellers
- Digital Platforms

Real Estate Developers

- Direct Sales and Partnerships
- Public Sector Tenders

Public Sector and Municipalities

- Government and Public Sector Tenders
- Partnerships with Public-Private Initiatives

Retrofit and Renovation Projects

- Project-Based Contracts
- Industry Networks and Conferences

Lars Miikki

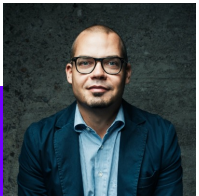
Project Manager at Metropolia University



*“One customer segment that is currently **underserved** in the Sustainable and Circular Construction sector **is small and medium-sized construction companies**. These companies often **lack the resources and knowledge** to implement sustainable and circular practices at scale.”*

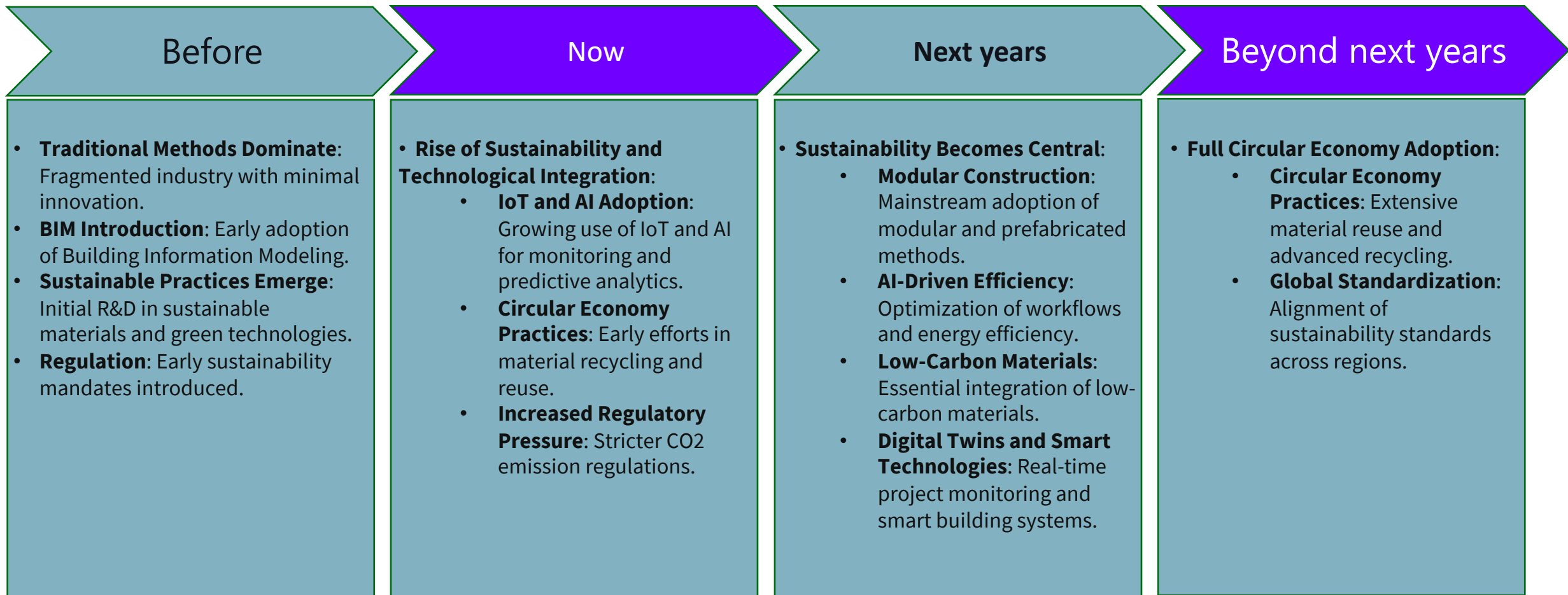
Teemu Lehtinen

CEO at Kirahub



*“**Construction business is very local, heavily regulated** so it is hard to come up with new channels. Somehow tapping into the local networks through resellers, through partnerships, through kind of major players is a way to go. **Not too much channel innovation happening**. Digital platforms and industry-specific networks are key for engagement.”*

Roadmap: The evolution of the construction industry



References



Aalto University
Startup Center

www.d2xcel.eu

References

1. [Construction sector](#)
2. [Environmental sustainability in the building sector](#)
3. [Circular construction and materials for a sustainable building sector](#)
4. [European construction sector observatory](#)

Other Market Opportunity Roadmaps



Logistics Market Opportunity roadmap



AI-Powered Digital Services for Sustainable and Smart Cities Market Opportunity roadmap



Sustainable Freight Transportation Market Opportunity roadmap



Large-scale Stationary Energy Storage Market Opportunity roadmap

Authors

 [Nikita Akmaikin](#)

*Project Manager
at Aalto Startup Center*



 [Dr. Roy Nyberg](#)

*Start-up entrepreneur
and Mentor*



 [Dr. Henrik Keinonen](#)

Staff Scientist at CKIR



Interview participants



 [Lars Miikki](#)

*Project Manager at
Metropolia University*



 [Roberta Gilardi](#)

CEO at G-Gravity



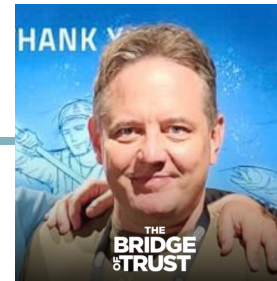
 [Petri Rinne](#)

*Entrepreneur at
Coventures*



 [Pontus Stråhlman](#)

*Partner at Voima
Ventures*



 [Jussi Muurikainen](#)

Founder at Liquido.vc



 [Teemu Lehtinen](#)

CEO at Kirahub



THANK YOU!



d2xcel.eu



info@d2xcel.eu