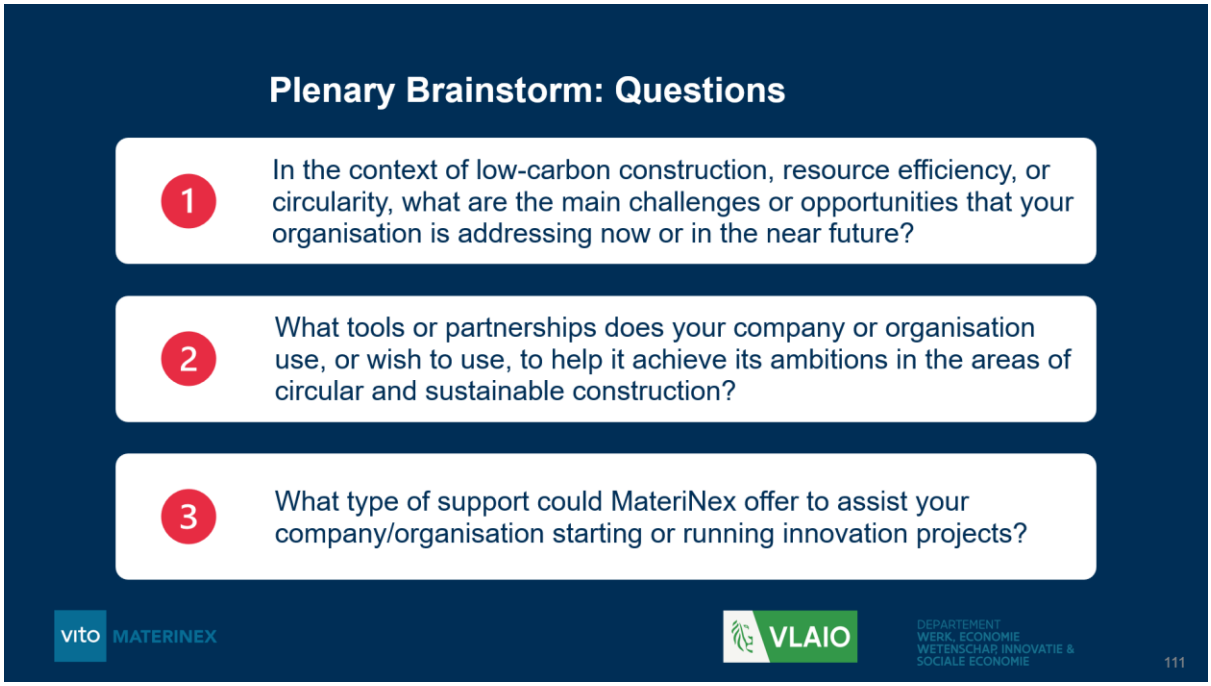
Insights from the CIG Brainstorm Session – 16 December 2025

Scaling Circularity: Materials Innovation for Tomorrow's Built Environment



Context and objectives:

During the Common Interest Group (CIG) meeting on 16 December 2025, hosted by Cordeel Group in Temse, a brainstorming session was held around the three questions listed above.

The discussions will help the MateriNex team to streamline the Materials for Building and Construction innovation theme more effectively and strengthen MateriNex's role as a facilitator.

We also hope that these exchanges will inspire and energise the CIG community, encouraging them to identify relevant projects and foster impactful partnerships.

MateriNex hosted by VITO nv
Visiting Address: Roderveldlaan 5, 2600 Berchem

info@materinex.be

Discussion 1:

In the context of low-carbon construction, resource efficiency, or circularity, what are the main challenges or opportunities that your organisation is addressing now or in the near future?

A. Summary

The responses from both industry representatives and researchers reveal a landscape of shared ambitions and distinct challenges as organizations work toward low-carbon construction, resource efficiency, and circularity.
Currently, both industry and researchers are actively seeking ways to increase the use of secondary and alternative materials, such as industrial by-products and biobased resources, in construction. There is a strong focus on improving recycling rates and integrating recycled aggregates into new concrete, as well as on developing and certifying new material solutions. Both groups recognize the importance of reliable data and standardized certification processes to support these efforts. However, they also face significant obstacles: the industry points to a lack of clear market demand, inconsistent material availability, and the need for government incentives and policy support. Researchers, meanwhile, emphasize the technical complexities of incorporating new materials, the need for better data quality, and the importance of collaboration across the construction value chain.
Looking to the future, the emphasis shifts toward designing buildings and materials for disassembly and reuse. Both industry and researchers see value in creating standards and certification schemes that recognize the economic and environmental value of reused and recycled materials. There is a shared interest in developing business models that can support circularity, as well as in leveraging digital tools and databases to track materials and facilitate reuse. Industry respondents highlight practical challenges such as sorting demolition waste and adapting to new specifications, while researchers focus on simplifying material compositions to make recycling easier, developing non-destructive testing methods, and leveraging digital tools and databases to support circularity.
Across both timeframes, common ground is found in the drive to improve material efficiency, data quality, and certification, as well as in the recognition that policy, market incentives, and collaboration are essential for progress. Unique to researchers is a focus on academic-industry partnerships and the technical validation of new materials, while industry voices stress the realities of market readiness and operational implementation.
In summary, the journey toward low-carbon, resource-efficient, and circular construction is marked by a convergence of priorities between industry and research, with both groups calling for better materials, data, standards, and collaboration. The path forward will require not only technical innovation but also systemic changes in market structures, policy frameworks, and business models to fully realize the potential of circularity in the built environment.

B. Current challenges and opportunities

Industry
Key Themes:

MateriNex hosted by VITO nv
Visiting Address: Roderveldlaan 5, 2600 Berchem

info@materinex.be

VLAIO
DEPARTEMENT WERK, ECONOMIE WETENSCHAP, INNOVATIE & SOCIALE ECONOMIE

- **Material Use & Availability:** Use of secondary materials (e.g., slag), focus on cement alternatives, availability and consistency of materials, incentives for recycling, and certification.
- **Market & Policy:** Lack of market demand, need for government implementation of circularity, and integration of reuse in design tenders.
- **Waste & Recycling:** Focus on waste management, reusing recycled aggregates, stimulating deconstruction waste, and integrating reuse in demolition plans.
- **Sustainability Criteria:** Uncertainty about what constitutes the "most sustainable" solution (biobased, low CFP, circular, etc.).
- **Technical & Economic Aspects:** Calculation of material impact (CO2), advice on €/environmental impact, and making infrastructure future-ready.

Researchers
Key Themes:

- **Material Innovation:** Incorporation of biobased materials in LCA, increasing recycled content, and developing new material combinations.
- **Data & Assessment:** Upgrading data quality, automating circularity and LCA assessments, and shared datasets for reuse.
- **Collaboration & Responsibility:** Convincing partners to adopt circular building, clarifying responsibilities in urban mining, and new ways of working together.
- **Technical Challenges:** Leaching issues, durability, technical frameworks for reuse, and integrated design.
- **Opportunities:** Natural fibers as carbon-negative, non-reinforced concrete as carbon sink, and valorization of local resources.

Topics in Common

- **Material Use & Recycling:** Both groups focus on increasing recycled content and using alternative materials.
- **Data & Certification:** Both mention the need for better data, certification, and standardization.
- **Circularity Implementation:** Both are concerned with integrating circularity into design and construction processes.
- **Market & Policy:** Both see a need for incentives and policy support to drive circularity.

C. Future Challenges & Opportunities

Industry
Key Themes:

- **Design for Circularity:** Dismountable design, material choice, and making concrete elements ready for reuse.
- **Waste Valorization:** Upcycling waste streams, especially as cement substitutes.
- **Standardization & Certification:** Setting standards with financial authorities, certificates for reused elements, and nominal requirements.
- **Business Models:** New value for recycled products, business models for increased reuse, and cost breakdowns including externalities.
- **Implementation Challenges:** Sorting demolition waste, lack of storage space, and general road construction specifications.

Researchers
Key Themes:

MateriNex hosted by VITO nv
Visiting Address: Roderveldlaan 5, 2600 Berchem

info@materinex.be

VLAIO
DEPARTEMENT WERK, ECONOMIE WETENSCHAP, INNOVATIE & SOCIALE ECONOMIE

- **Material Simplicity & Innovation:** Keeping materials basic, developing fully circular composites, and bio-based materials for concrete/bitumen.
- **Collaboration & Data:** Closer collaboration with industry, collective solutions, data quality, and databases for circularity.
- **Reuse & Testing:** Reuse of concrete beams, non-destructive testing, and design for disassembly.
- **Complexity & Performance:** Embracing complexity of circular materials, performance proof, and demonstrators.
- **Digitalization & Inspiration:** Urban mining, digitalization, and learning from industry case studies.

Topics in Common

- **Design for Reuse:** Both groups focus on making materials and elements reusable and dismountable.
- **Standardization & Certification:** Both see the need for standards, certificates, and clear requirements for reused materials.
- **Data & Digitalization:** Both mention the importance of data quality, databases, and digital tools for circularity.
- **Business & Value Models:** Both are interested in new business models and the economic value of reused materials.

Key Insights

- **Strong overlap** exists between industry and researchers, especially on material use, recycling, data, certification, and the need for circularity in design and construction.
- **Future focus** shifts more toward standardization, business models, and digitalization, with both groups recognizing the need for collaboration and new value frameworks.
- **Unique to researchers** are themes around performance proof, and academic-industry collaboration.
- **Unique to industry** are practical challenges like market demand and infrastructure readiness.

Discussion 2:

What tools or partnerships does your company or organisation use, or wish to use, to help it achieve its ambitions in the areas of circular and sustainable construction?

Across both company and research partner perspectives, the brainstorm highlights four clusters of “enablers” that would materially accelerate circular and sustainable construction.

1) Policy, norms and permitting as primary accelerators. Companies see regulation and certification as the biggest levers: faster approval and certification of new (and reused) materials, standard agreements that support insurability, and clearer treatment of reuse/circularity in ecological scores (incl. EPB). They also ask for reuse standards plus a central reuse platform and smoother digital data exchange, and for governments to embed circularity requirements in public tenders. Research partners add that research and innovation can help “shift the landscape of norms and certification” by providing robust substantiation.

2) Data availability and practical assessment tools. On the operational side, companies want material inventories, storage and logistics tools to move reusable components between sites, and discovery mechanisms for reuse (a “*‘Vinted’ of building materials*”). They also point

MateriNex hosted by VITO nv
Visiting Address: Roderveldlaan 5, 2600 Berchem
info@materinex.be

VLAIO
DEPARTEMENT WERK, ECONOMIE WETENSCHAP, INNOVATIE & SOCIALE ECONOMIE

to public databases for available (bio-based and reclaimed) materials and their cost/time impacts. Research partners emphasize expanding and sharing sustainability assessment instruments (LCA/LCC/LCI and databases), further developing TOTEM, and enriching functional units with performance parameters like durability/service life.

3) Testing and validation capacity to de-risk innovation. Research input stresses lab and modelling infrastructure (structural/climate testing, time-dependent effects, imaging-based characterization, calorimetry/strength tests for recycled binders, thermodynamic modelling) and developing demountable structural solutions.

4) Partnerships and funding ecosystems to scale. Companies cite university partnerships, access to grants (e.g., VLAIO), joint investments in recycling installations, pilot/demonstration projects, and value-chain collaboration (a virtual "Belgian Alliance for Sustainable Construction" or "Belgian Green Building Council"). Research partners align, proposing ecosystem building through partnerships and living labs (notably for certification), with companies shaping market-relevant research questions and industry picking up lower-TRL results for material innovation.

Discussion 3

What type of support could MateriNex offer to assist your company or organisation in starting or managing innovation projects?

The input for this section is based on contributions from approx. **30 participants**.

	Research Organisations			Companies		
	Prior 1	Prior 2	Prior 3	Prior 1	Prior 2	Prior 3
Support from MateriNex						
Initiating horizontal collaboration as a trusted party	7	2	1	13	6	1
Support in forming your consortium in alignment with ICON guidelines		2				1
Networking ½ day		4	2	4	2	5
Mulitiple network sessions	2		4	4	5	3
Updating innovation roadmaps based on your input in focus groups	1	2	3		5	10

MateriNex is recognized as a trusted party within its ecosystem, valued for connecting stakeholders, facilitating collaboration, and fostering a constructive context for information exchange by both companies and research organizations.

MateriNex hosted by VITO nv
Visiting Address: Roderveldlaan 5, 2600 Berchem

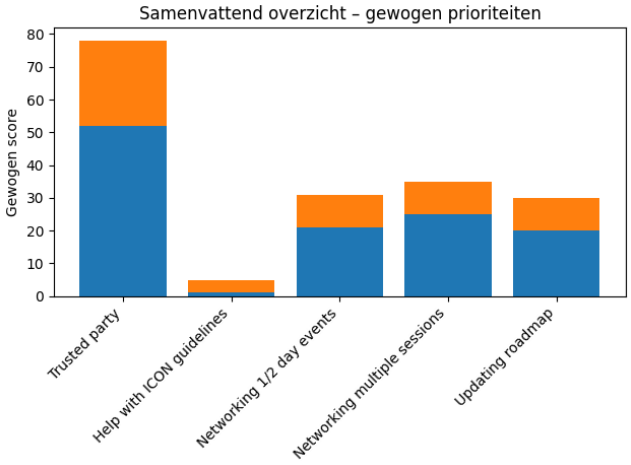
info@materinex.be

VLAIO
DEPARTEMENT WERK, ECONOMIE WETENSCHAP, INNOVATIE & SOCIALE ECONOMIE

Companies emphasize MateriNex's role in networking and supporting collaboration, while research organizations also see its potential for strategic alignment through networking and roadmap discussions.

The low priority given to support for ICON guidelines reflects participants viewing this area as procedural and policy-driven, with MateriNex's value lying more in enabling dialogue and cooperation than in interpreting formal guidelines.

Overall, the survey confirms that MateriNex's strength lies in enhancing its current trusted role, considering the varied expectations of stakeholders, providing a solid basis for its future development.



MateriNex hosted by VITO nv
Visiting Address: Roderveldlaan 5, 2600 Berchem

info@materinex.be