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Abstract	This deliverable aims to summarize the key findings of the WP4 research within the CREATE project, leading to policy recommendations for Circular Economy in the Built Environment (CEBE) governance. As a result, this deliverable presents five key enablers for effective CEBE governance: (1) using evidence during the decision-making process; (2) enhancing PPP collaborative governance; (3) developing CEBE policy instruments knowledge access for local stakeholders; (4) reducing existing CEBE policy incoherence; (5) using the small wins framework to capitalize the local innovation. Each section addresses a core challenge identified as a barrier to effective CEBE governance and proposes policy recommendations that can support a transformative pathway toward a circular built environment.
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INTERNAL REVIEW

1 INTRODUCTION

This deliverable aims to summarize the key findings of the WP4 research within the CREATE project, leading to policy recommendations for Circular Economy in the Built Environment (CEBE) governance. These findings and recommendations are based on studies conducted between 2022 and 2025.

The first component of the research focuses on identifying circular data and the use of tools in the decision-making process at the city level. This led us to examine the tendering process of the Hezelpoort project in Nijmegen, highlighting the levers and barriers associated with the use of circular criteria to enable circular cities.

The second component of WP4 concerns analyzing the governance context within the CREATE project's Living Labs. Beyond cataloguing existing CEBE policy instruments in each country and at various levels of governance, we also conducted interviews with local stakeholders in two Living Labs—Rennes Métropole and the Arnhem-Nijmegen region. These interviews explored stakeholders' awareness and use of these policy instruments, as well as their perceptions of the coherence of the overall CEBE policy regime.

This study revealed key barriers, including limited access to knowledge among local stakeholders and significant policy incoherencies that hinder effective CEBE implementation. However, the findings also underscore the capacity of local stakeholders to navigate the complexity and contradictions within the CEBE policy regime in order to develop circular urban project.

As a result, this deliverable presents five key enablers for effective CEBE governance: (1) using evidence during the decision-making process; (2) enhancing PPP collaborative governance; (3) developing CEBE policy instruments knowledge access for local stakeholders; (4) reducing existing CEBE policy incoherence; (5) using the small wins framework to capitalize the local innovation. Each section addresses a core challenge identified as a barrier to effective CEBE governance and proposes policy recommendations that can support a transformative pathway toward a circular built environment.

2 USING EVIDENCE IN DECISION PROCESS TO ENABLE CIRCULAR CITIES

Levers and limitations of using circular criteria during a tender procedure

By analyzing the case study of the Hezelpoort urban project tender procedure in Nijmegen, we explored how circularity assessment tools are developed, used, and experienced within municipal decision-making and tendering processes to enable circular building projects (see Chartier and Pot, 2024).

The Hezelpoort project involves the construction of a double tower of 383 apartments—including 211 social housing units—and 573 parking spaces. The project includes a 25% circularity target, with specific goals for the use of recycled and biobased materials, as well as removable components. For this tender, a specific assessment tool—the "dashboard"—was developed to support the decision-making process. The dashboard was designed to evaluate the circularity of developers' proposals using key performance indicators (KPIs) as criteria for the tender. This case study highlights both the potential and the limitations of using such evidence-based tools to support decision-making in the context of circular urban development, and it leads to several recommendations for practitioners.

The use of the dashboard during the tendering process demonstrated that setting up clear circular criteria is valuable for assessing the design and circular ambitions of project proposals. It encouraged participants to consider circular solutions from the early stages of planning in a detailed and structured way. The municipality also used the dashboard results to structure its contract with the selected developer, making KPI scores contractually mandatory to reach. If the agreed KPI scores are not achieved, the contract can be terminated. This approach helps ensure that circular economy (CE) objectives are met while also securing the project's budget. In practical terms, the developer must meet the specified circular score. In cases of material price fluctuations, the developer may decide to change suppliers or materials—as long as the overall circular score is maintained. The dashboard also facilitated stakeholder dialogue by helping all parties jointly identify and agree on circular criteria. Additionally, it provided quantifiable results of CE achievement at the city level.

However, the study also shows that using such evidence with precise circular criteria was not directly useful to choose a design as each participants score very well on each KPI. Making a distinction was problematic. The municipality use another tool, more subjective, during the tender procedure that was more helpful to make a choice: a description of the manner to reach the KPIs score. The precise KPIs orientated also too much the design and the participants (developer and architects) felt a limited in their capacity to innovate and propose their own view about circularity on the project. Finally, signing a contract based on the KPIs score also raised uncertainties for clients who have no visibility of the final design¹.

Need to define circularity and its assessment methodology

The use of the dashboard as a circularity assessment tool raises new issues about the definition of circular criteria and the methodology for their measurement. Eden and Wagstaff (2021) state that the methodology for the creation of sustainable assessment tools needs to be questioned. The selection committee defined first the circularity criteria and their weight in the tender procedure, giving more importance to adaptivity and Milieu Prestatie Gebouwd (MPG, the mandatory environmental assessment tool) score. This early decision did not leave room for other approaches, and the developer, influenced by what was being measured (the KPIs), proposed a design that fitted the circularity criteria.

This is important, because defining circularity by a building's adaptability and MPG is questionable. Both criteria are based on the building's long-term use. MPG calculates the long-term environmental impact, and adaptability concerns the lifetime and leaving options open for different purposes for the building. These circularity criteria do not refer to the CE's direct R-ladder (Cramer, 2017),² such as the application of reused or recycled materials, but to a potential *future* reuse or repurpose of elements of the building, which is arguable.

This situation questions the subjective nature of the definition of circularity criteria and their measurement, in contrast to the displayed objectivity of CE measurement tools. For example, a concrete building could be assessed as circular in the long term but with adverse short-term environmental impacts. In other words, all sorts of materials and housing projects could be

¹ For detailed information of the case study, please refer to the deliverable 4.2

² Refuse, Reduce, Renew, Reuse, Repair, Refurbish, Remanufacture, Repurpose, Recycle, Recover.

argued to be circular, depending on the definition of circularity and the assessment methodology.

Similar issues have emerged in the CREATE Living Lab project in Rennes Métropole, where the absence of a clear definition of circularity has led to a wide range of interpretations and actions at the city scale. This has resulted in a lack of territorial coherence in implementing circular strategies.

Furthermore, while circular assessment tools such as the MPG in the Netherlands and the PEMD (Product, Equipment, Material and Waste diagnosis) in France are mandatory for obtaining building or demolition permits, there is no subsequent enforcement to ensure the implementation of their assessments and recommendations. In this context, the use of the Dashboard during the Hezelpoort tender procedure stands out as an innovative approach. By linking contractual obligations to the Dashboard's scores, it ensured that circular ambitions were maintained throughout every phase of the project—from design to construction.

This situation demonstrates the need to strengthen the national legal framework and regulations to define the circularity criteria in the BE, their assessment methodology and control in the short and the long term. The Netherlands is working on a standard definition of circular criteria for the building sector (Het Nieuw Normaal³), and MPG has already been made mandatory to assess a building's environmental impact in the long term. However, the existing MPG to measure the short-term impact should also be mandatory. Moreover, the Dutch government procurement service is preparing a regulation to set a certain percentage of biobased and recycled material to be used in procurement. The municipalities could define their criteria such as a percentage of circular material in a project. This short-term/long-term approach to circularity could stimulate the market for circular construction.

Enable dialogue to define circular criteria during the tender procedure

The competitive dialogue tender procedure fits the BE's circularity challenge. Competitive dialogue is less restrictive than a normal tender procedure, brings flexibility, stimulates

³ [Het Nieuwe Normaal | Cirkelstad](#)

innovation, and allows public and private stakeholders to discuss the evidence (Uttam and Le Lann Ross, 2014; Haugbølle et al., 2015).

However, the quality of the dialogue procedure might be improved by using evidence as a support to stimulate the dialogue and not to drive the decision. We have demonstrated that using the dashboard did not leave enough room for the developer to innovate in the *Hezelpoort* project design. To reduce this effect, the municipality could propose its general circular ambition but discuss the circularity criteria and assessment method with the developer during the procedure. The developer could propose a circular solution based on its approach that respects the municipal ambitions. This process might be strengthened by a neutral actor (e.g., an external company) that could coordinate stakeholders' different interests and stimulate creative dialogue (Vanacore et al., 2023). Hence, the developer and the client could co-create the dashboard and the circular criteria at all steps of the decision-making process.

Moreover, other tender procedures that enable innovation could be chosen to stimulate CE in urban projects. Vanacore et al. (2023) highlight the role of sustainable public procurement in the improvement of collaboration leading to innovation development for CE. Rapid Circular Contracting⁴ has been developed in the Netherlands: it allows a developer and a client to sign a contract based on ambition and vision, before having the solution. The innovation is co-created after the contract. This sort of procedure could be adapted to circular ambitions in the BE.

3. ENABLING PPP GOVERNANCE-COLLABORATIVE APPROACH

Lack of PPP to enable CEBE

Circularity in the built environment requires new public/private arrangement and collaboration to use efficiently data and tools to enable a coherent territorial approach. A governance including different public and private stakeholders (including stakeholders of

⁴ [Over ons – Rapid Impact Contracting](#)

urban planning, of production of materials and waste management) is hence important to support the global strategy of the circularity in urban planning.

However, in the CREATE Living Lab, one of the main challenges was securing the participation of private stakeholders in public urban and circular project. The circular economy is often more expansive and complex than a regular construction method, which does not encourage private stakeholders' participation. Moreover, municipalities lack the authority to push private stakeholders to share data (about material stock for instance) especially when these stakeholders already operate their own internal systems for managing construction and demolition waste.

Furthermore, there is a lack of instruments to enable coordination across governance levels or among stakeholders. As a result, local governments, despite their internal CE governance efforts, struggle to implement their CE objectives due to competition between local stakeholders, a siloed approach, and mistrust, especially in the absence of more formalized obligations to adopt CE practices. Ranabhat et al. (2018) underline the lack of clear implementation plan in a context of climate change adaptation policies, leading to delays as local governments and stakeholders attempt to define roles and responsibilities.

Incentive to stimulate private stakeholders participation

Incentive and rules to stimulate private stakeholders' participation in circular project should be therefore developed. Termeer and al. (2024) identify the rule change, through new regulation that impact the entire system quickly, as one of governance pathway for transformative change. However, the transformative change relies on the engagement of many stakeholders to change their practices and to do so, the rule change pathway must contain an incentive system that rewards the stakeholders. For instance, economic incentive such as tax reduction for circular material use should be created to support the stakeholder's engagement in CE practices. Furthermore, economic incentive to stimulate collaboration between private stakeholders and local authorities might enable territorial coherence in circular urban planning. This incentive system for adopting circular practices is lacking in the current CE policy regime and must be developed to transform linear building practices.

Enable dialogue among stakeholders during the decision-making process

Moreover, the example of the Hezelpoort tender procedure highlight the positive impact of a collaborative (PPP) and iterative approach to address CEBE challenge. Indeed, as Head (2014) explains, dialogue minimises the uncertainties and complexity of wicked sustainability problem. The description of the *Hezelpoort* decision process emphasises the importance of Nijmegen municipality's learning and collaborative approach, which fits the complexity of CO₂ emission reduction in the BE. The municipality applied an iterative approach, before and during the dialogue procedure, to develop, jointly with the client, the developer, and external companies, innovative solutions to achieve and secure the project's circular ambition. This approach allowed the co-creation of circular criteria to implement in the tender process, sharing responsibility for innovation, and creating trust among the stakeholders, thereby limiting the risk of conflict in the long term (Mayer et al., 2005; Head, 2014). At the project level, co-creation of solutions between public and private stakeholders should be developed in order to improve their engagement and responsibility in circular ambition by sharing a joined objective.

4 ENABLING CEBE KNOWLEDGE ACCESS AT THE LOCAL LEVEL

Lack of awareness and use of policy instruments

In the CREATE project we conducted a governance context analysis in each country and Living Lab, identifying the various CEBE policy instruments at different levels (European, national, regional, local). Based on this list, we carried out a study on the awareness and use of these policy instruments by local stakeholders, especially in Rennes Métropole (France) and in the region Arnhem Nijmegen (The Netherlands). Globally, the CEBE policy regime was perceived by stakeholders as complex and evolving, which hindered their ability to fully understand and to implement CEBE.

The analysis of the awareness and use of CEBE policy instruments in Rennes Metropole and the GMR Arnhem-Nijmegen reveals that local stakeholders are generally not well aware of instruments developed at higher levels of government. There is limited knowledge regarding the existence of these policy instruments or their implications for the local level. Hence, there is a gap between the significant role assigned to the local level in European and national CEBE

policies and their actual awareness and use of these instruments, which hinders effective CEBE implementation.

Moreover, awareness of a policy instrument does not necessarily lead to its use by local stakeholders. This situation highlights the lack of strategic communication and support to access policy instruments from higher to lower levels of government, creating a barrier to an effective CEBE implementation.

Furthermore, the complexity and technical nature of the circular built environment, often force local stakeholders to rent the service of consulting firms specializing in sustainability and circular measurement. In the case of the Hezelpoort tender procedure, the municipality hired such firm to help define circular criteria before the tender procedure, but also to support the decision-making during the process and to assess the design promised by the developer afterward. This reliance on external expertise indicates a long-term need for such support. The strong dependence on external consultants to build and manage such evidence highlights even relatively large municipalities' lack of circularity assessment skills. Producing robust and measurable evidence requires therefore both financial resources and technical skills (Eden and Wagstaff, 2021; Stone, 2001).

Several obstacles explain the limited awareness and use of CEBE policy instruments by local stakeholders. First, access to CEBE policy instrument knowledge relies on a bottom-up knowledge access approach. Hence, access to CEBE instruments knowledge is often informal and dependent on individual willingness to explore the topic.

Secondly, the CEBE local implementation relies mainly on the willingness of the public and private stakeholders to engage with a multitude of soft instruments (networking, pilot project, etc.). In practice, local stakeholders only use mandatory legal policy instruments that directly impact their practices and prefer using soft instruments. Also, even stakeholders are using soft instruments to gain knowledge, they often point to the overwhelming number of knowledge platforms and networks operating at different levels. This fragmentation leads to confusion, discouragement, and ultimately, limited effectiveness.

Therefore, access to knowledge about CEBE instruments depends on the availability of resources (finance, time and human capacity) within local governments and other stakeholders. This lack of knowledge might be a compounding factor of inequalities between

cities and between construction companies that do not have the same financial capacities to procure external support or to gain knowledge. Therefore, there is a risk that the circularity market in the BE associated with the need to produce measurable results could be limited to a few big cities and companies that can tackle the CE transition.

Developing CEBE knowledge access for local stakeholders

Hence, CEBE induce the need of new skills and knowledge that are currently lacking. All municipal decision-makers and employees should receive training on circularity in the BE, its existing regulations, its measurement and scientific insights on life cycle assessments, and its integration into the decision-making process. To meet this challenge, municipalities will need to adopt a reflexive approach, continuously learning about new legal frameworks at the European and/or national level, innovative architectural designs and building methods, evolving tools to measure circularity, etc. Developing a dedicated knowledge platform could be beneficial. Ideally, this platform should be managed by a regional institution to prevent competition among different knowledge sources which may lead to a counterproductive knowledge market. Finally, it is crucial that municipalities, especially the smaller ones, join forces and become active in regional conferences and networks on the circular economy. This will help foster peer learning, build collective capacity, and reduce disparities in the ability to implement CEBE policies effectively.

5 REDUCING POLICY INCOHERENCE

Policy incoherence of the CEBE policy regime

Based on the governance context analysis, we also conducted interviewed with local stakeholders from Rennes Métropole and the Region Arnhem Nijmegen to identify their perception of policy incoherence of the CEBE policy regime.

Globally, high national circular ambitions are undermined by a lack of mandatory policy instruments, legal barriers (e.g., no tax incentive for circular material, restrictions on waste reuse), and inadequate support for local stakeholders (e.g., limited resources, knowledge, and infrastructure). Our findings align with Henrotay et al. (2017) who highlighted that sustainable construction policies rely on voluntary instruments, while complex legislation causes contradictions and poor implementation.

Moreover, we demonstrated that the main policy incoherences stem from layering (new objectives and instruments added without alignment with existing ones), and drift (new objectives but old policy instruments). The layering in the CEBE policy regime led to policy incoherence between objectives (CE and energy policy goals, for instance), between instruments (such as a proliferation of soft policy instruments), and between instruments and implementation (for instance, economic instruments like subsidies that do not lead to CEBE implementation). As a result, the CEBE policy regime appears complex to stakeholders and limit their engagement in CEBE implementation. The drift in the CEBE policy regime is creating policy incoherence between new objectives and outdated policy instruments, such as the regulation insurance framework or the waste status that limits reuse practices. Other instruments appeared not adapted to the objectives, especially the mandatory assessment tools like the MPG or the PEMD, which do not stimulate enough biobased, reuse material or the avoidance of material use.

Furthermore, we identified the lack of instruments and implementation mechanisms as another main source of policy incoherence. Local stakeholders emphasized the lack of instruments to promote participation in CEBE implementation, the lack of economic incentives for CE material, the competitiveness of raw material prices, and the lack of control of CEBE ambitions implementation. They also highlighted the absence of clear guidance, adequate resources, and infrastructures to support their role in achieving CEBE objectives. These gaps reveal a disconnection between the high-level of CEBE ambition and the reality of the resources (legal, financial, human) of the local stakeholders.

As a result, drift and layering within the policy regime hinders implementation and causes ineffectiveness (Kern and Howlett, 2009) and incoherence within the CEBE policy regimes in both countries do not sufficiently enable circular practices. Instead, conventional building practices persist, short-term economic benefits remain the priority, and CE alternatives remain costly compared to traditional materials like cement, concrete, and steel. The existing policy regimes promote new construction and recycling rather than renovation, reuse, or waste prevention (Augiseau, 2019, Hanemaaijer et al. 2025). A focus on recycling rather than waste prevention reveals a circular economy approach that still operates within a linear and liberal economic framework with a focus on green economic growth (Henrotay et al., 2017; Rask, 2022; Beulque et al., 2016; Ghiselini et al., 2016; Gerardi, 2019).

Finally, our study highlighted the fact that the policy coherence framework analysis prioritizes a focus on policies over analyzing the (lack of) local implementation, while the CEBE political regime clashes with local realities. The implementation remains vague concerning the practical aspects, and the resources but also regarding the local realities, territorial context, stakeholders' issues, and culture. These incoherences reveal a mismatch between a political regime that is supposed to be coherent and robust and the reality of the stakeholders who are supposed to implement it. The ineffectiveness of implementation is therefore also a policy incoherence that is not considered due to a top-down analysis of the policy coherence (Huttunen et al., 2014).

Recommendations to reduce CEBE policy incoherence

To establish a transformative CEBE policy regime, national CEBE objectives must be clarified by governments and aligned with policy instruments to reduce inconsistencies.

The new CEBE policy regime should contain more mandatory instruments, particularly to support reuse, biobased material, and local supply chain. Legislative measures, such as setting a minimum circular material use requirements or revising procurement rules can integrate circular criteria or the spatial dimension of material origin, could be helpful. Also, a neutral institution at the metropolitan level could facilitate CEBE implementation by promoting collaboration among stakeholders, controlling activities, centralizing knowledge on CEBE practices, legal changes, and secondary material availability.

Other policy instruments, such as the insurance material regulation and the waste status, should be adapted and removed to avoid layering, be aligned with the CEBE objectives, especially to stimulate reuse practices. Existing tool such as the MPG or REP (Extended Producer Responsibility) should also be adapted to better support biobased and reused materials and consider the short-term environmental impact rather than focusing on long-term and recycling.

In the context of the CEBE policy regime, for instance, tax reduction for circular or local material use can be developed to balances the competitiveness of the new material and landfill tax could stimulate reuse practices (Augiseau, 2019). Legal an economic instrument, such as carbon finance mechanisms, could encourage waste prevention, material use avoidance and renovation efforts.

We also highlighted the complexity of the CEBE policy instruments reinforced by a lack of governance level and stakeholders' coordination. Thus, our last recommendation is to improve such coordination by working on a vertical and horizontal policy coherence. Indeed, Nilsson and al. (2012) explain the necessity to work on the horizontal policy coherence to reduce the gap between European and local level. This coherence might improve by proposing more legal and economic incentive instruments for CEBE implementation. For instance, incentive-based tax reduction of reused materials or mandatory circular criteria in construction projects could be instruments better aligned with the European or national ambitions of both countries. For now, indeed, CEBE remains too complex and costly for many stakeholders.

Finally, in order to assess the coherence of the CEBE policy regime, the analytical framework should address gaps, such as the lack of appropriate instruments and implementation, as well as the local context realities. Local context must be considered in terms of issues, resources, territorial and stakeholders' specificity. Turcu and Gillie (2020) highlight the importance to understand the complexity of the context and existing power dynamics to enable the CE implementation. The reality faced by local stakeholders, along with the identified incoherence due to the lack of instruments and local implementation guidance, should be therefore systematically considered. These insights can provide constructive feedback to inform and readapt the CEBE policy regime at national and European level and improve its coherence.

6 USING LOCAL INITIATIVES FOR A CEBE TRANSFORMATIVE GOVERNANCE

Diversity of local initiative to enable CEBE implementation

Throughout our research in the CREATE project, we highlighted the innovative capacity of local stakeholders and authorities, characterized by a diverse range of approaches to experimenting with CEBE strategies.

Regarding the policy incoherence for instance, we identified several strategies developed by local stakeholders to address policy incoherence. Stakeholders demonstrated capacity to develop their own policy instruments to support collaboration and knowledge sharing, or to propose their circular assessment tool, such as the Circular Impact ladder of the Green Metropole Region Arnhem Nijmegen. Stakeholders also adapt CEBE objectives and

instruments according to their resources or ambitions, sometimes exceeding national targets (with the PEMD+ for instance), and/or creating synergy between circular and social objectives.

Moreover, we also demonstrated the variety of strategies deployed by local stakeholders to deal with a lack of knowledge on CEBE policy instruments. Stakeholders can try to conduct their own research activities, use stakeholders' networks or pilot projects in order to learn about the CEBE implementation. The diversity of these efforts illustrates the willingness of local stakeholders to implement innovative solutions and lead to a plurality of interpretations of circularity in urban development, because of lacking definitions at the national level (Prendeville et al., 2018).

Hence, the role of local governments is crucial to support local CEBE knowledge development. The urban Living Lab facilitated pilot projects and approaches tailored to their territorial context and stakeholders' needs, while trying to align with national CE ambitions. They also deploy their own training to share and develop contextualised CE information. In the context of the Hezelpoort project, we can emphasize the innovation capacity of the municipality taking the risk to develop and test the dashboard in the tender procedure of a main urban project. These diverse local CEBE approaches are innovative, voluntary, and foster a learning process for local stakeholders. They represent a necessary phase of trial and error within the context of the novelty of CEBE, contributing to the iterative and informal knowledge building of local authorities and their partners (developers, urban planner, etc.).

However, the research demonstrated the crucial role of local stakeholders in reducing policy incoherence that remains undervalued. These proliferations of innovation and initiatives are not valorized, upscale or coordinated across stakeholders and governance levels. Hence, despite their efforts, local stakeholders still have difficulty defining a strategy to develop CE as well as their role, especially local governments (Cramer, 2020; Institute Paris Region 2021).

Using the small wins to enable CEBE implementation

These locally tailored innovations, align with the small wins' governance framework, which emphasizes a bottom-up approach and provides a pathway for transformative changes (Termeer and Metze, 2019; Termeer and al., 2024). Small wins are accessible, context-specific initiatives that deliver visible results, build trust, and motivate further action accelerating the CE transition (Termeer and Metze, 2019). However, the government must play a key role in

recognizing impactful small wins, providing support, ensuring visibility and activate mechanisms to scale (expanding the initiative), broaden (connection CE and other challenges) or deepen (fundamentally change process) these initiatives for transformative change. Termeer and Dewulf (2018) identified six mechanisms that government can activate and that might be fit the CEBE context: (1) encourage the small wins development by a positive framing (energizing); (2) capitalize on pilots results and enable space for risks (learning by doing); (3) create credibility by giving a reward for instance to attract resources (logic of attraction); (4) spread success stories beyond the CE community to convince people to do the same (bandwagon effect); (5) recognize and enable the linkage of CE objectives with other policy domain (coupling); (6) institutionalize successful pilot by policy adjustment and new formal regulation (robustness). Applying the small wins framework to the CEBE context could thus help reduce policy incoherence and support more effective implementation.

7 CONCLUSION

5 key policy recommendation domains

Our research about the governance of CEBE in the different Living Lab led us to formulate 5 key policy recommendations domains to enable circular cities: (1) using evidence during the decision-making process; (2) enhancing PPP collaborative governance; (3) developing CEBE policy instruments knowledge access for local stakeholders; (4) reducing existing CEBE policy incoherence; (5) using the small wins framework to capitalize the local innovation. These recommendations are not exhaustive but might contribute to stimulate a transformative pathway to a circular built environment.

First, at the project level, evidence such as circular criteria, circular data and assessment must be use during tender procedure in a specific approach. The example of the Hezelpoort case study reveals both the potential and the limitations of using evidence-based circularity assessment tools in municipal tender procedures. Applying circular KPI's helps assess design proposals and ensures developers align with municipal circular ambitions. When integrated into contracts, such criteria can secure performance across all phases of a project and allow flexibility in execution which can be useful to maintain CE goals in case of price fluctuations. This also fill the lack of following of the after use of mandatory instruments such as the MPG in the Netherlands or the PEMD in France. The project also highlights the urgent need for

clearer definitions and harmonized methodologies for assessing circularity. Relying on metrics such as adaptability and MPG scores may overlook CE principles like reuse or recycled content. Establishing national regulations and mandatory tools, with both short- and long-term assessment criteria, would strengthen the consistency and impact of such tools.

Secondly, the transition to a CEBE demands new forms of PPP and collaborative governance. Indeed, effective circular strategies require coordination among diverse actors, including urban planners, construction firms, and waste management stakeholders, that is still lacking. Introducing incentive to stimulate coordination and PPP in urban project must be developed. Especially to stimulate the share of data and engagement of the private sector and the private stakeholders often perceive circular projects as costly and complex, discouraging participation. Introducing economic incentives—such as tax reductions or financial rewards for using circular materials or collaborating with municipalities—can drive engagement by making circular practices attractive and viable for private actors. Furthermore, at the project level, considering the innovative character of circularity, dialogue among participants (public and private) must be reinforced. Adopting collaborative and iterative approach in tender procedure can help to cocreate indicator and stimulate tailored solution and stakeholders' participation. Engaging stakeholders in co-creating circular criteria and solutions helps reduce uncertainty, builds trust, and shares responsibility for innovation. Competitive dialogue procedure or procurement models such as Rapid Circular Contracting may better support CEBE implementation.

Thirdly, we demonstrated in our study in Rennes Métropole and the Region Arnhem-Nijmegen that the transition to a CEBE is deeply hindered by limited access to knowledge and understanding of relevant policy instrument designed at higher levels of governance. This disconnection between levels of governance hindered the circular policies implementation. There is therefore a need for structured knowledge access and capacity-building initiatives to support local implementation. An improved strategic communication support is essential to ensure that local actors are not only aware of these instruments but also understand their implication and how to apply them. There is also a need to give resources (time, money, people) to local stakeholders to develop their understating of the CEBE policy regime. Also, municipalities frequently rely on external consultancy firms to interpret and apply circular criteria, highlighting a structural lack of internal expertise. To foster long-term self-reliance,

local authorities must have resources to invest in upskilling their staff through training programs focused on circularity, regulation, assessment tools, and life cycle thinking. Moreover, the current fragmentation of circular knowledge sources created confusion and inefficiency. A unified knowledge platform (ideally managed by a regional institution) would support knowledge access about regulation, tools, best practices exchange. This could help especially smaller municipalities that lack the resources of larger cities.

Fourthly, we demonstrated that the policy incoherence of the CEBE policy regime undermines its implementation at the local level. Our analysis in Rennes Metropole and the Region Arnhem-Nijmegen reveals that ambitious national and European objectives often clash with outdated instruments, vague implementation mechanisms, and insufficient support for local stakeholders. To reduce layering (new objectives and instruments without removing the old ones) and drift (new objectives but outdated policy instruments) that hinder the CEBE implementation, outdated regulations must be revised—such as waste status and insurance constraints—and mandatory tools like the MPG and REP must be readapted to incentivize reuse, biobased materials, and material reduction. The CEBE policy regime is also characterized by a majority of soft instruments and a lack of legal and economic incentive, such as circular criteria in procurement process, material reuse targets, and fiscal mechanisms like tax reduction for circular/local materials. Renovation and material avoidance strategies should also be supported or rewarded. Finally, local context should be considered into policy design as the current framework ignore implementation gaps rooted in local realities such as contextual constraints, limited capacities but also territorial, cultural and stakeholders' dynamic.

Finally, we also identified the local initiatives as a potential key role in driving the circular transition in the built environment. Our research within the CREATE project reveals that despite issues faced by local stakeholders—such as policy incoherence, lack of guidance, and knowledge gaps—they demonstrate significant capacity for innovation, adaptation, and leadership. Through voluntary actions like piloting tools, developing context-specific circular indicators, and developing their own objectives and instruments tailored to their reality, municipalities and other actors showcase the transformative potential of local experimentation. However, these local efforts remain fragmented, undervalued, and poorly

integrated into the CEBE policy regime, while recognition and mechanisms to scale or institutionalize successful local practices, might be a key level of CEBE implementation. Therefore, adopting a small win's governance framework (Termeer and Metze, 2019; Termeer and al., 2024) could support these efforts. Governments at national and regional levels must take an active role in identifying, rewarding, and scaling impactful local innovations. By supporting learning-by-doing, enabling risk-taking, linking CE to broader societal challenges, and translating successful pilots into formal policy, small wins can accumulate into large-scale change. An effective CEBE governance must change its top-down policy design approach and recognize local initiatives as a strategic entry point for a real transition.

Limitation and recommendation

This study, while offering valuable insights, also presents several limitations that point to important avenues for future study. The primary limitation is the geographical scope: our analysis was limited to three urban living labs and most of our research focus on two European regions (Rennes metropole and the region Arnhem Nijmegen), and to a relatively small group of stakeholders, given the CREATE framework and the emergent nature of CEBE.

Despite efforts to distinguish context-specific elements from those of broader relevance, the case studies method used can limit the transferability of some results. Comparative studies involving additional cases (about circularity assessment tools use in decision making, CEBE policy coherence, local CEBE initiatives, etc.) would improve the generalizability of findings and deepen insights into the implementation dynamics of CEBE across Europe.

Concerning especially the tender procedure case, further studies comparing tender promises to actual circular outcomes can offer insights about implementation gap and lever for effective circular ambitions implementation.

In addition, our study about the CEBE policy coherence emphasizes a stakeholder's perspective rather than conducting a detailed legal analysis of policy coherence. While this bottom-up approach helped identify both formal incoherencies and perceived gaps in the CEBE regime, it should be complemented by a legal-document-based policy coherence analysis to create a more comprehensive understanding of how policy design and legal

instruments align with circularity objectives. We also acknowledge that the research focused primarily on vertical and internal policy coherence. A more exhaustive, cross-domain and cross-level analysis of policy coherence in France, the Netherlands, and other European regions would help identify systemic gaps and solutions that facilitate local implementation of CEBE strategies.

Furthermore, territoriality and proximity dimensions—such as the spatial aspects of construction and waste materials—remain understudy in our approach within CREATE project while there is a lack of consideration of this concept in the CEBE policy regime. Future study should explore the socio-economic and logistical barriers to creating local supply chains and propose “proximity governance” approaches to reinforce local material loops (Bahers et al., 2017). Such efforts would also benefit from examining collaborative strategies that foster synergies among regional and local stakeholders. The inequalities between stakeholders generated by the CEBE policy regime implementation should also be studied in order to enhance participation and for a just CEBE transition.

Lastly, this research encourages the development of a CEBE governance framework tailored to local realities, building on the concept of “small wins”. Future research could also contribute by refining the conceptual framework of policy coherence and assessing the applicability of transformative governance pathways to CEBE policy regimes.

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