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# ReCreate

Reusing precast concrete for a circular economy

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## **Guide to Coalition Building for Circular Construction**

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# Abstract

**This Guide to Coalition Building outlines the parameters of coalitions in the circular building economy. National cases vary on actors involved, but the key is information as an essential element towards policy requirements.**

The transition to the circular building economy does not occur by decree. The process involves many actors, from small and large firms to the public sector and end-users. Not only are there actors involved, but there is also a need for innovations and institutional changes, from work processes and digital infrastructures to updating of regulations and building codes. Furthermore, at the EU level there are developments that ultimately aim to make the circular economy compatible with the single market.

This very broad constellation of actors, processes and institutions is the environment in which the circular building economy takes form. For the practical task of starting circular building projects there is a great need for (temporary) coalitions, that operate in this environment towards a specific goal, such as a building permit for a construction using reused materials.

In this guide for coalition building, I argue that to achieve the goal, there has to be an alignment between the actors in the circular value chain on the one hand, and the permit-issuing authorities on the other hand. The policies on basis of which building permits or zoning plans are issued, are determining what is the exact information needed from the circular value chain. However, these policies also vary by country and even by location, as local authorities may have specific climate change mitigation policies. To a substantial degree, the national building codes are nonetheless shaped by EU level recommendations and directives.

Therefore, transitioning to a circular building project involves a lot of knowledge of (locally valid) rules, institutions and strategies. It also requires managing a coalition in which actors may have different incentives and must be willing to share information/data and think through the whole circular value chain in terms of information required (see Wijewickrama et al. 2021). Interaction between these so-called construction project coalitions and regulation coalitions may also involve external actors, such as firms that perform accreditation of the building materials or provide a certified calculation of Life Cycle Assessment (LCA).

Concludingly, the transition to a circular building economy is not only dependent on technical innovations and their implications, but also on information flows between actors in the circular value chain. Furthermore, the transition depends on a smooth flow of information between the two coalitions. Interpretation, demand and supply of information are vital to manage the implementation and scaling of circular economy solutions.

# 1. Introduction

**This Guide for Coalition Building provides a general understanding of policy process requirements involved in the construction sector.**

This guide is meant to provide help in translating technical solutions into positive policy outcomes. The circular building economy is entwined with a complicated set of policies relating to climate goals, zoning implementation and building/housing goals. Added to these are EU-law requirements, rules and regulations, such as those relating to the Common Market and building codes. The technological solutions developed in the ReCreate project for the reuse of precast concrete elements, or other similar initiatives, face local policy objectives, established policy processes and established construction plan assessments. Since the ReCreate solutions, as other innovations, are experimental and often 'in front of' policy, it is likely that local policy processes do not always appear accommodating, despite formal policy goals.

Although this guide cannot provide a how-to guide to acquiring a building permit for a circular building project tailored to specific countries or cities, the aim is nonetheless to show the key issues involved in this kind of projects. Other circular economy initiatives and innovations will likely face similar issues related to the idiosyncrasies of national policies and actors. The issues presented in this document should resonate also for other projects, especially because in the policy sphere there are unclarified issues, such as the meaning of the Construction Products Regulation (CPR) 305/2011 for the circular building economy. The issues in the document also show the need for understanding and interpreting information flows between the authorities' decision-making processes and a construction project (Winch 2002; Weible et al. 2010).

In addition, this Guide to Coalition Building functions as a theoretical lens to discern what actors are important in the various stages of a construction project. Construction is a heavily regulated economic activity (see e.g. Halonen et al. 2023). Partners in a construction project are aware at the practical level of regulations that apply to certain phases, from deconstruction to planning (structural requirements) to constructing. This also includes e.g. work safety legislation and monitoring. A secondary aim of this guide to coalition buildings is to provide a framework from which barriers and enablers in policy support for circular construction can be more easily discerned, as the guide takes as its point of departure the practical aspects of a construction project. On this basis, it can be employed to find the appropriate level of interaction between project partners and authorities.

A barrier to social acceptability may lie in the local policy processes. As a technical solution, reuse of concrete elements could help cities and countries achieve climate and emission goals. However, the acceptance of these solutions in the various stages of acquiring a building permit is perhaps a matter of negotiation and coalition building with and inside the issuing institutions, as no established procedures are available yet, in all cases. These procedures involve evaluation criteria, which local authorities have to decide on. In this sense, the pilot projects of ReCreate also set important precedents for the

countries involved. Furthermore, these point to the need of information management (Zeiss et al. 2021).

However, there may also be cases where the construction process intersects with other policies and interests that are not directly relevant or are outside the scope of a construction process's sphere of potential influence. Zoning regulations may be an example, and environmental regulations such as those that currently have led some provinces in the Netherlands to decline building permit applications.<sup>1</sup> In the other ReCreate partner countries there is no such issue, mainly because of differences in surface area size and sizes and locations of Natura2000 areas.

This guide aims to be a fairly general description of relevant actors, institutions, policy processes and policy goals. However, it is important to acknowledge that social acceptance of the reuse of concrete elements in the construction sector is likely to be greatly influenced by the implementation of local policies (e.g. Goulden et al. 2017; Bolgor and Doyon 2019; Cramer 2020; Hossain et al. 2020). In a few of the ReCreate project countries this has been implicitly mentioned in policy documents –all building takes place in a jurisdiction, after all. In this sense the regulations also influence business models. This aspect is, nevertheless, outside the scope of the current document, as it will be studied in deliverables emerging from ReCreate's Work Package (WP) 7.

A core element here is policy learning by actors involved – not only the firms that prepare the application for permits, but also the actors within the local government who must assess the application. Neij and Heiskanen (2021) argue that there are many factors that currently limit policy learning at the municipal level, including institutional and professional aspects. They note an explicit need to develop resources to acquire new knowledge and unlearn previous practices. The local government is not to be seen as a unified whole, but different sections may have different preferences, competences and interests, which may even depend on the personal opinions of the deciding civil servant. Institutional capacity building through policy learning processes is necessary (Neij and Heiskanen 2021). In lieu of existing frames of assessment, these internal tensions and preferences may be highlighted (Weible et al. 2010). This can contribute either to broader discussions about policy instruments in the context of the circular environment or to a sense of arbitrariness in decision making, which may have to be contested in a court of administrative law. These policy dimensions will be studied with the ReCreate project in a later phase, when the pilots have proceeded to a stage where the policy processes can be studied empirically.

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<sup>1</sup> In the Netherlands, there is an on-going political and regulatory crisis regarding nitrogen (NOx) emissions. On a local and national level, it has been calculated that emissions exceed what is allowed in the vicinity of Natura2000 areas. As a result, especially the construction sector faces 'freezing' of projects due to authorities not giving permissions for building projects on environmental policy grounds. See e.g. Stokstad (2019) for an overview. In the context of reuse and the ReCreate project, see also Halonen et al. (2023).

In this broader sense, the interaction between ReCreate pilots and other pilot projects, and the local government represents a scalable problem: how are various aspects of climate policy implemented through local policy instruments? Other parts of the circular economy will likely face similar obstacles in implementation. Between national policy and technical innovations in firms and universities there may be local policy obstacles that are not in line with national policies. Policy obstacles could lead to policy innovations, too. Local government implementation is therefore a key driver in climate policy, especially concerning the construction sector (cf. Hossain et al. 2020:7-13).

A key role is accorded to the translation of existing construction policy criteria, intended for virgin material products, for reused materials and components: what is the legal basis on which reused products can be deemed to comply with these criteria? This question likely hinges on the interpretation of the available options by the local authorities, together with other involved actors. Interpretation is necessary to transform information into knowledge (Adams 2004). In this sense, ReCreate and other similar innovation pilots offer an opportunity for 'situated learning' that takes places in the context of current policies (cf. Särkilahti et al. 2021; Weible et al 2010; Fischer 2003:31-35). Below, I sketch different aspects that provide criteria for circular building permits: CE ('conformité européenne', European conformity) marking, structural-technical criteria and environmental criteria. These are aspects where the material and regulatory dimensions of construction projects intersect.

## 2. Background

**This section introduces the background for the need for coalition building as a vital practice of the circular building economy.**

### 2.1. Aim of the coalition building guide

This guide to coalition building is focused on a specific goal. For the ReCreate project, the critical goal is to apply successfully for a building permit for the pilot buildings. However, this linguistically simple sentence hides a wealth of actions and information by different actors. A non-circular building project includes a myriad of planning and negotiation stages between various actors. The pilot projects in ReCreate, and circular building projects more generally, complicate these stages by including the deconstruction phase, and subsequently the logistics and quality assessment of the salvaged elements to serve as 'input' to the regular building construction process. In short – the full circular value chain is involved in terms of material, work and information (Zeiss et al. 2021). It is recognized that there are many additional informational and legal dimensions to building projects, such as property rights and tendering laws, that have a role in the circular building economy, but these will not be discussed here.

### 2.2. The intersection of policies

Construction projects are complicated in a legal sense, as they form a focal point for a large array of private and public law issues. These range from tendering and ownership matters to environmental law and building code questions. Most of the issues resulting from existing law are well-known to actors in the construction sector. However, the construction of circular buildings presents some specific issues that make applying for a building permit appear complicated. The main reason is that in such projects, rules governing materials standards, building codes and environmental standards intersect and even overlap. In particular, CE marking of building materials has been flagged as a potential stumbling block to reusing materials. In ReCreate, this issue is more fully researched in WP4. CE marking requirements and other related requirements from the Eurocodes, regulating structural design in the EU, could imply the need for testing materials for essential characteristics.

These tests are connected to the (ultimate) function of the CE markings: comparability of products, which is one of the cornerstones of the European Single Market. However, there may be a need for testing the characteristics of materials for other reasons as well. Sometimes the CE mark is seen as a quality marker, but as Wall (2021) shows, the CE marking in construction products is a constellation of many guidelines and procedures, including EU level actors and specific instruction for tests. The CE mark in construction products is in essence a marker of conformity with existing single market rules. Therefore, in the context of a construction project CE marked materials indicate they are in principle safe to use and conform to certain standards. For reused products that do not originally



have a CE mark, the compliance with essential technical criteria should be shown by other means, e.g. tests. It appears to be somewhat unclear to what extent the implementation and requirements of the CPR (305/2011) suits with circular building projects at the level of building permits.

For this deliverable the relevance of the certification issue (and other testing) is how it relates to local policy making. Although the CE mark is a presumption of compliance with existing rules and regulation on e.g. product safety, this in itself does not mean these CE marked materials comply with the building code of a given jurisdiction. Building safety may be an emergent property of product safety, but in order to successfully apply for a building permit, the used materials have to comply with the demands of the building code (see e.g. Nieman 2020 for the Dutch case). The Eurocodes can be amended by national rules (for example, in the Nordic countries the snow load bearing metrics are more relevant than in Spain), therefore knowledge of the local rules beyond the CPR and Eurocodes is necessary for construction companies, and in particular construction engineers are very familiar with local construction requirements.

A relatively new issue is environmental regulation that apply especially to the construction sector. These do not necessarily derive from plans to achieve a circular economy, but at least in theory, they would bolster the case for reuse of concrete elements, given that concrete is a major source of CO<sub>2</sub> emissions. Regulations that deal with Life-Cycle Assessment are studied in the context of ReCreate's WP6, but in many countries building permits have some kind of environment-related component. In the Netherlands, this has been developed quite far already: buildings not only have to comply with 'structural-technical' requirements but also should comply with the rules governing the so-called 'Environmental Building Performance' (see e.g. van Loon et al. 2019 for an overview). In the Dutch context, information should be provided of building materials, in order to be able to calculate the total environmental performance. This information is not limited to carbon dioxide emissions, but also includes calculations on phosphor emissions, water use, nitrogen emissions and even radiation and toxicity measures. New materials have to be assessed and measured, and currently the so-called National Environmental Database (*Nationale Milieudatabase*) is developing ways to measure and score the environmental impact of *reuse* of materials in the context of the Dutch regulation (NMD 2021). Therefore, in addition to testing technical properties for building code purposes, it may be necessary to assess the environmental impact (LCA) as well. The environmental impacts of the circular economy can be clearly shown through the Dutch way of measuring. Processes and materials are assessed for their impact, and through the National Environmental Database, this information can be used for other cases. Consequently, the wide availability of data and information can help policy makers to set and evaluate local and national climate policy goals.

Also in the Swedish case, there are requirements regarding the environmental impact of new buildings. The climate impact has to be assessed in terms of embodied carbon of construction materials, i.e. CO<sub>2</sub> released in the production of these materials. Included are also the transport of these materials to the construction site, energy-consuming processes and waste materials at the construction site. Methods to measuring these can be found in

modules A1-A5 of the EN 15978 standard. Like in the Netherlands, there is a Swedish database of environmental data of building materials and products, maintained by the sectoral construction organization Boverket (*klimatsdatabas*). Developer can make use of these data or products' Environmental Product Declaration if available. Also in the Swedish case, there is thus an environmental requirement as well as a structural-technical requirement. However, probably because of geographical differences the Swedish requirements do not yet include issues like impact on soil.

The German environmental requirements focus (at the moment) exclusively on module B of the LCA, i.e. the use phase. There are currently no requirements regarding embodied emissions or specific provisions on reuse of building materials. However, also these energy-oriented measures have an impact on how a building project is executed, as various professions must be included to achieve the expected energy standards.

Finland does not have currently legislation demanding Life-cycle analysis, but the new Building Act will include several requirements. It enters into force from the 1<sup>st</sup> of January 2025, and in the future, building permit applications will have to be accompanied by a climate declaration of the carbon footprint and carbon handprint (the beneficial impact on emissions that would not happen without the building). The Ministry of the Environment will prepare a decree on the methods of calculation. Although currently there is little know about the practical consequences, the new act also states that the party undertaking a building project is responsible for planning the whole life-cycle sustainability of the project. In practice this will induce further co-operation by project partners throughout the value chain, especially when reuse is involved.

Concludingly, depending on the jurisdiction, a circular building economy project, regarding material characteristics, has to deal with requirements in (at least) three different spheres. First, if applicable, is the issue of CE marking. This is an issue most likely relevant for the scaling of the use of donor buildings and therefore explicitly linked to the business case. Second, the local building code. The demands of the building code may require testing, but there are other ways of dealing with relative uncertainty of material properties, like oversizing or the use of a factor of safety. The third sphere may currently vary most by country: the environmental requirements in construction. These requirements are assumed to be well-known to the building companies, although different countries are introducing them at different times, so depending on the context there may be more or less experience with this kind of policy instruments. The challenge for circular building projects is how local authorities interpret their requirements for the use of reused materials, and what and how they require information on compliance with these requirements.

As a recommendation, the partners in the construction project should involve the local authorities at an early stage, in order to gain knowledge about potential stumbling blocks and how these can be overcome. An essential ingredient is data – as an input needed by the deciding authorities and also as an internal project asset towards circularity. As Zeiss et al. (2021) and Lawrenz et al. (2021) show, there is a great need for bridging the information gap in the circular economy: ensuring stakeholders can use and share the relevant information for both policy making and production/construction processes.

## 2.3. The need for data

The intersection of policies and policy requirements show the increased need for data and data management in the construction industry (see Bilal et al. 2020:11; Zeiss et al. 2021). Within ReCreate, this is a topic of development in its own right, in WP 3. However, the implication of this need for data is the need for a coalition in which this data is produced and can be reconfigured by diverse actors for their own purposes. Furthermore, this data should also be reconfigured outwards to attain the building or deconstruction permit. The empirical research into the requirements of such permits will show what data is needed, what internal processes lead to the data requests and how it should be produced. In linear building, this is not a very big issue, as it is 'business as usual'.

The interesting phase starts when it is unclear on the policy side what information is needed to issue a permit. To some extent, depending on the country, this is a fluid situation and dependent on local interpretations of the rules, which can be more or less clear on this aspect. For example, in Finland, pending changes in building law necessitate other ways of interpreting regulations related to circular building, as circular construction is not yet explicitly addressed in the national law. Also in the Netherlands, a body comprising of industry experts and academics is pondering norm development on this issue (CB'23 2022). Legally, deconstruction in the Netherlands is seen as dismantling rather than demolition. In Sweden, developers must indicate in deconstruction processes which parts will be reused, but no further guidance currently exists. In Germany, it has to be reported in advance where and how a building will be dismantled, but there are no (*Land*-specific) requirements for reuse. Especially in this kind of situation, policymakers may have to depend on developments at EU level, neighbouring countries or expert opinion, which emphasizes the time-dimension: (local) authorities may not be quick in forming a coherent position. A core idea here is policy learning, in which the role of expert knowledge is emphasised (Fischer 2003:31-35; Weible et al. 2010). This concerns essentially all knowledge needed in construction processes and related decision-making, which also means that innovation engenders the need for new (and sometimes conflicting) knowledge. This resonates with earlier research on implementation of circular economy programmes, such as Cramer (2020) for the Amsterdam Metropolitan Area. Her research shows that the involvement of local government is ultimately very important for the ability to scale up circular economy initiatives, especially in removing obstacles to the transition to a circular economy. There are three main points: first, the local authorities can signal intent with strategies and goals. Second, local (and national) authorities can show willingness to remove obstacles to circular activities and third, the initiatives of local authorities spark the growth of a network of significant actors, which can evolve into a cohesive ecosystem (Cramer 2020:6). Francart et al (2019) shows for the Swedish case what local authorities can do to induce construction with low climate impact. Local climate strategies, knowledge and data sharing are seen as important in steering construction projects toward a lower climate impact. For the purpose of ReCreate, the material requirements related to CE marking and building codes mentioned above constitute a (potential) obstacle on which local and (supra)national authorities can act, but these are obstacles that may be cleared through deliberation rather than through a legal route.

## 2.4. Local strategies: signaling intent

Local government is bound by national and European law in what it can and should do. Therefore, applying for a building permit is a process that exists in the context of the functions the national government has delegated to the local government (for example, housing policy) (Meijer and Visscher 2017). However, local authorities can also adopt their own climate goals and work to achieve these (for recent EU-wide data, see Salvia et al. 2021). Kristianssen and Granberg (2021) show in the Swedish context what the typical obstacles for local implementation of climate goals are. They show a key obstacle is the lack of focus and prioritization, which means administrators have to be 'activists' in order to interpret the local climate adaptation plan. This is seen in the lack of clear structures, political support and specific plans, and highlights the need for knowledge and information. Salvia et al. (2021) show that in the EU, most cities have a local climate mitigation plan, which is locally and autonomously developed, rather than legally required or mainstreamed policy goals. They show that Northern European cities are more ambitious, although they conclude that climate mitigation plans are behind the curve regarding the the goals of the Paris Agreement. These articles do not connect climate action plans with local building policies directly. Bilal et al. (2020) nonetheless argue that a lack of such strategies can be perceived as a barrier to circular economy in the construction sector.

Although the circular economy could be a goal in itself, in ReCreate it is strongly linked with reducing CO2 emissions, new business models and social acceptability. WP6 of the project explicitly deals with the climate impact of reusing prefabricated concrete panels. In a technical sense, circular building solutions should be compatible with a city's climate mitigation strategy. However, in a political sense, the direct linking of circularity with climate mitigation is not necessarily the best option to garner the highest social acceptability. Drews and van den Bergh (2016) show there are many issues that affect public support for climate policies. They show that, because of the strong link between values and climate policy acceptance, framing of the policy as well as clear communication about consequences, especially regarding costs and benefits is important (see also den Exter et al. 2015). Nonetheless, cities' climate mitigation strategies may feature goals and practices that coincide with developing the circular economy.

From this perspective it is useful to distinguish between 'goal-oriented' and 'means-oriented' approaches to policy implementation (Cashore et al. 2019). A goal-oriented policy includes the exact goal the policy is intended for (e.g. evacuating a building in a reasonable time in case of fire; minimum load bearing capacity). A means-oriented policy prescribes the specific technology or process how to achieve the policy goal (e.g. a fire door must resist fire for 30 minutes). Commonly, policies feature a mix of both elements. A feature of goal-oriented policies without prescribed means, is that they allow and promote innovation by companies, as the policy is agnostic to the means used for achieving the goal. For scalability to occur, the local policy instruments must apply in practice the goals of the local strategies, which can be seen as an adaptation of national and European policies (e.g. the Paris Agreement). Although the goals of the climate agreements are clear, at the national and local level there is much freedom to achieve these goals. In other words, the goals are set, but the means are flexible, leaving space for local authorities to encourage innovation.

Bilal et al. (2020) mention awareness-raising policies, subsidies and monitoring of implementation, which promote innovations to achieve goals. Den Exter et al. (2015) show that for the Dutch case, anchoring of climate goals in the local organization is important to achieve the involvement of many departments, but with sufficient centralization to adapt to new topics and challenges. In this case, a new mix between goals and means was achieved. Also here the role of information supply and demand was important. Furthermore, they, like Bilal et al. (2020), emphasize the role of public-private partnerships, so climate actions become rooted outside the public sector and benefit from private sector innovations.

If we adopt this view towards policy implementation, it becomes clear what the space for innovation is (both for firms and on the policy level). Commonly, regarding both construction and sustainability codes, there is some flexibility to deviate from the criteria, provided it can be shown that the alternative is as good as what is in the regulation. Means-oriented policy thus provides the space for innovation in combination with policy goals, because it provides decision-makers with a clear frame of reference regarding potential deviations. Nonetheless this requires a certain flexibility in interpretation of the prescribed means on behalf of the local authorities. Existing policy means can be reinterpreted in lieu of updated legislation. Abstract climate agreements are translated into material policy decisions at the local level. This translation takes place in a constellation of existing policies, which can cause friction and uncertainty as environmental, construction and other criteria mix together.

Therefore, information is key, as it may have impact on policy processes and after-market value and insurance issues alike. Furthermore, it must be established in practice what information is needed and by whom. As Kristianssen and Granberg (2021) and others argue, a large part of climate adaptation relates to policy learning. Further research in ReCreate's WP8 will identify processes of policy learning in Finland, Sweden, Germany and the Netherlands, using available empirical material. Furthermore, Bilal et al. (2020) argue that a lack of environmental laws and regulations is driving other barriers to the circular economy, including the lack of support from public institutions. It is this context that circular building projects operate in. Among the mitigating strategies Bilal et al. (2020) mention are support by local authorities and public-private partnerships, as well as the more active coordination of circular economy projects. This deliverable is not intended to argue how local governments should implement circular economy, but to show the connections that can be made between the different actors, especially regarding information needed.

### 3. Two coalitions

**This section introduces the view of two distinct coalitions in the circular building economy. These interact in the context of local policy and both produce and require data.**

In this coalition building guide I will consider two coalitions. The idea of coalitions is based on Pryke (2004), who describes construction projects as ‘non-linear, complex, iterative and interactive process[es]’ and focuses in particular on the role of information exchange in the coalition. The first coalition consists of the actors in a construction project that, on the one hand, must negotiate and confer with the relevant local authorities in order to gain knowledge of the relevant and required information for a building permit and on the other hand, work together in order to then provide that information. This is the ‘construction project coalition’. The second coalition is the ‘policy coalition’, which consists of the actors that are relevant for demolition and building permits, including actors that are involved in policy-making around these issues. The actors include local governments, supervision authorities, policy networks and various quasi-public sector bodies, such as the Dutch task force for circular construction transition ‘Transitieteam Circulaire Bouweconomie’.

It remains unclear to what extent existing building permit requirements adapt to the use of salvaged concrete elements: this is a policy-making problem, for which there may be a need for a strong policy entrepreneur presenting the idea in the local authority context. Policy entrepreneurs are energetic actors who engage in collaborative efforts in and around government to promote policy innovations (Mintrom 2019). This issue of course also has been noted at the national level in various countries, so ideally it could be a temporal problem.

Useful for an analysis of policy and projects in the circular building economy is Béland & Cox (2016), who discuss the role of ideas as ‘coalition magnets’. The circular building economy could be seen as such an idea, which has an ‘ambiguous or polysemic character -- that makes it attractive to groups that might otherwise have different interests.’ The circular building economy can be seen as a means to reduce GHG emissions, but it can equally be seen as an innovation for the construction sector, with affects economic growth, value creation and work. The idea of ‘coalition magnets’ provides a focus for some of the barriers that Bilal et al. (2020) identified, especially regarding legal environment and public institutional support. A coalition magnet is an idea used by policy entrepreneurs to find a new language for a policy problem, for example the circular economy in the construction sector and how it connects housing policies and climate policies. Furthermore, the idea is supported (or advanced) by key actors in the policy process, which gives it legitimacy. Finally, the idea brings together actors that previously would not necessarily co-operate, thereby rearranging power relations (Béland and Cox 2016:429-432; van Kerkhoff and Lebel 2006). Another way of viewing the idea of coalition magnets is Fischer’s (2003:100-109) discussion of discourse coalitions, where actors are united by narratives and the facts that can be expected to follow from these. A classic example is acid rain: the narrative called ‘acid rain’ can accommodate facts like dead fish and withering forests, which otherwise



could have been seen as isolated problems. In a discourse coalition, actors do not even have to be in contact: the narrative of climate change can engage actors worldwide and accommodate their specific issues. The idea or narrative of circular building economy likewise has the potential to engage a wide variety of actors. Béland and Cox (2016) argue that ideas as coalition magnets can achieve social consensus that can overcome political divisions. This appears to be a fruitful way of looking at policy change in the construction sector, where traditional actors face the possibilities and challenges of the circular economy.

The interaction between the two proposed coalitions resembles a chicken-and-egg problem: if it is unclear how the building permit-issuing authorities are to assess the use of salvaged concrete elements, how can the circular construction project coalition gather the correct data that would lead to a positive decision on a building permit? This will be the main research question of ReCreate's WP8 regarding this issue, which cannot be answered yet, due to a lack of empirical data this early in the project. Circular construction such as proposed in ReCreate may be the kind of idea that works as a coalition magnet. However, at the same time it can also to some extent emphasize divisions in interpretation, or as Fischer (2003) would say: divergent narratives in policy-making. Nonetheless, because of the flexibility allowed (in principle) by a proper mix of goal- and means-oriented policy, this issue will be resolved. ReCreate is disruptive in the sense that the pilot projects challenge the current regulation, which does not explicitly explain how a circular construction project should be handled. In linear construction projects, the requirements for the building permits are known in great detail because of extensive experience and knowledge of the existing building code. However, in a circular construction project, there is no established set of requirements other than those that currently exist. In policy documents, it has been noted that this is a problem, since these requirements are usually for new materials and components and it is unclear to what extent it is appropriate to apply these to reused materials and components. This is an issue many EU countries are currently struggling with.

From a project management point of view, Pryke's (2004) discussion of network relations and how they move information through the coalition certainly appears valid for the circular building economy as well, as it is shaped by personal and contractual relations as well as by actor behaviour. His view of construction projects suits well with the interaction between a project and a policy environment, especially when there is policy learning involved and regarding the role of information exchange. His view also suits to the analysis of ideas and how these affect power relations (cf. Béland and Cox 2016). Finally, the combination of these views link to the barriers identified by Bilal et al. (2020) and how these could overcome and be studied.

In the rest of this document, the two coalitions are described in more detail, including what kind of interactions they have internally and between each other. Further research should show why the local authorities prefer or require certain building material requirements over others. This also raises questions for scalability and the cost of compliance with (potential) certification. Within a coalition, there also might be a preference for certain modes of certification, since they are less costly. Analysis of these preferences will be done in future research in cooperation with ReCreate's WP7.

Below I discuss the two coalitions that exist with regard to the building permit processes in the circular building economy. It should be noted that a possible third coalition, that of the 'general public' is explicitly left out here, since the role of feedback on construction plans by third parties is not an object of study in the ReCreate project. I argue, with Pryke (2004), that organizations/actors are members of a (temporary) coalition if they have high levels of interface dependency. This interface dependency can be even higher in circular building projects than what Pryke (2004) describes for the 'traditional' construction sector. The actors in the coalition share interfaces, which are the points of information transfer. Winch (2002) argues that for this reason, construction projects should be seen as networks of information flows. The members of the two coalitions are defined by their function (i.e. producing a building/deconstruction permit application, producing a circular pilot project or in the other coalition, granting a building permit, implementing building policy etc.). It is also acknowledged that the actors in either coalition also have other relations outside that particular coalition (Pryke 2004:792).

### 3.1. Construction project coalition

The first coalition is by and large the regular organization of a construction project, involving planning, management, architectural and engineering companies, and construction companies for the various parts of the project. However, for the circular building economy, this coalition can be leaner or broader, depending of the extent of environmental regulation involved. Later empirical studies will show what the exact coalitions are for the four ReCreate countries.

#### 3.1.1 Data and information in coalitions

The leaner coalition builds on the idea that the project country does not yet have any advanced requirements for the inclusion of LCA calculations in building permit applications. Therefore, the coalition consists of the regular building project actors and as an addition the demolition actors and quality assessment actors. What kind of quality assessment is needed depends on local regulations – including environmental requirements. The most important aspect of the lean coalition is data sharing on the salvaged elements, as the building process is assumed to be normal in other respects. Data include a broad range of physical characteristics, but their requirement depends on what is locally required. In the ReCreate project, this data is provided by analysis at university or third-party laboratories, but realistically could be provided by commercial enterprises or (if required) certified institutions.

Data sharing by coalition partners is bound by contractual relations as well, especially when subcontracted companies are involved. Khudhair et al. (2021) argue that an enduring problem in the construction sector relates to data sharing and even though in recent years Building Information Modelling has become a much-used approach, there seems to be weak integration in the total project. While data sharing and the use of BIM is a topic of research of its own in the context of ReCreate's WP3, the literature recognizes the use of BIM as a separate paradigm with potential future use in construction regulation, at least regarding public procurement (see Lindblad and Karrbom Gustavsson 2021). At the EU level, promotion of the use of BIM is actively advocated through the BIM Task Group, to 'encourage



the common use of BIM, as “digital construction”, in public works with the common aim of improving value for public money, quality of the public estate and for the sustainable competitiveness of industry’ (EU BIM Task Group 2022). It is conceivable that also in the lean coalition BIM will become a norm for intra-firm communication and cooperation.

However, the BIM standard is heavily oriented towards virgin materials and standardized elements. Recent research looks at integrating BIM with aspects of sustainable building, such as LCA (for an overview of trends, see Della Mora et al. 2020 and Bertin et al. 2020). Nonetheless, also in the context of the ReCreate project, national differences both in application of BIM and LCA are present. These are therefore contextual variables that influence how a coalition operates and what kind of information it produces.

### 3.1.2 Extended information needs in coalitions

The broader coalition includes more actors of the circular building process than the lean coalition. This broader coalition is presumed to be necessary in countries where a building permit requires some form of LCA. The LCA of a particular project must be calculated/measured/modelled, so actors to address the country-specific requirements for these should be included in the coalition, in case there are separate processes related to the building permit. For example in the Netherlands, construction projects must include an LCA in order to get a building permit. For materials not included in the National Environmental Database, a certified LCA auditor can assess the environmental performance on a case-by-case basis. Similarly, in the Swedish case a slightly more limited LCA approach is used on embodied carbon, which necessitates the inclusion of external experts. In the forthcoming new Building Act in Finland a similar environmental impact assessment, based on whole-life LCA, has to be provided. Germany currently focuses on the use-phase of the LCA, which primarily focuses on energy emissions. The building coalition in the German case thus will have a different composition from the Dutch, Swedish or Finnish cases.

For the coalition, more integrated environmental requirements, such as the ones in use in the Netherlands and Sweden (and soon in Finland), also demand that there is tighter management on this issue, which then shapes into a norm that in all likelihood also shapes project planning and efficiency aims. Depending on the national regulation, these environmental requirements also shape the space for innovations, as these kinds of regulations are goal-oriented. Through these regulations, the inclusion of emission data for specific products may bind the project to then use these products, not only as a contractual matter within the coalition but also from the viewpoint of the building permit. Construction project emissions measurements are part of ReCreate’s WP6. In particular the use of heavy machinery (cranes, trucks, bulldozers etc.) is an aspect of construction work that can produce significant emissions. Sepasgozar & Blair (2021) show for the Australian case that urban, non-road diesel emissions are high and increasing. They also show, through a literature review, what measures in practice are available to measure these diesel emissions. These emissions may not be considered relevant in all cases, but at least in the Netherlands, this issue is urgent. Also in the other project countries both CO<sub>2</sub> and NO<sub>x</sub> emissions will have to be reduced. In the coalition it should be negotiated how to best achieve this goal, since it may determine the success of the overall application for the

building permit. Nonetheless, this is a specific issue which may be less relevant in some countries, depending on regulations.

## 3.2. Policy coalition

On the other side of the table is the policy coalition. This coalition is usually the local government, which is typically responsible for permits and local zoning plans. Other branches of government can be relevant too. Empirical research of the building permit processes in practice will show all actors that are in this coalition, but especially regarding the local government, it is relevant to note that within that organization, there are many departments and actors involved in assessing building permit applications (see also Meijer and Visscher 2017). Further research will employ methods and theories to determine how local decision-making processes are shaped in the case of circular building projects. Nonetheless, given the uncertainty in some cases about the compatibility of reused products with existing building regulations (and hence the need for testing), it is likely that internally there are differing views on the information required from the construction project coalition, in order to assess the application. These issues should become clear later in the ReCreate project. Hurlimann et al. (2021) show for the Australian case that in local policy making, climate mitigation policies are weakly integrated with planning policies. Kadefors et al. (2021) provide an overview of current research of the ways climate mitigation strategies can be integrated into public procurement processes. This study also reveals that it is complicated to include environmental criteria into these processes – not only because of varying rigor of the criteria but also their practical implementation.

In the context of further research into the policy environment, of particular interest is the question how issues of climate adaptation are integrated in the building permit processes, especially since the methods developed in ReCreate are explicitly aimed to connect with reducing carbon emissions in the construction sector. In particular Kadefors et al. (2021) show, although for infrastructure projects, that this is really an iterative process. Therefore, further research should not only look at the narrow decision on a building permit but also at the pre-application negotiations, application phase communication and construction phase inspections and discussions. Here also the need for learning and knowledge is apparent. Furthermore, also EU policies, such the CPR, have an (often indirect) influence on building permit assessment.

As a recommendation for coalition building, the construction project coalition should use its network contacts in the policy coalition to establish formal or less formal venues for discussion. Some of these may be facilitated by local law, others may depend on the initiative of the construction project coalition. The main reason for such pro-active behaviour is to map potential local policy obstacles (see also Bilal et al. 2020; Cramer 2020; Kirchherr et al. 2018). Furthermore, the construction project coalition can use its knowledge of local climate mitigation strategies to frame its project as a solution towards local goals, even if there is no formal link. Thus, from a policy perspective, there is a potential for scalability that extends beyond the construction sector processes.

### 3.3. Coalitions and policy processes

ReCreate's pilots will be constructed under current law, so not as experiments with special waivers. In this sense, the administrative process of the pilot construction already represents a proof of scalability: reused elements must, for applying for a building permit, conform to the same or similar standards as newly produced elements. The barriers to circular economy implementation Bilal et al. (2020) identify regarding the public sector link to (the lack of) financial instruments (subsidies), monitoring and implementation, taxation and coordination. Thus, from the point of view of existing building policy, the local authorities could do more to align their current decision-making with the implementation of their climate mitigation strategies. In particular the link between circular economy implementation and the coordinating role of the local authorities should be studied. Cramer (2020), for Amsterdam, argued that the local authorities do have a catalytic potential through removing barriers and functioning as a focal point (similarly but in a different way, also housing co-operations and other producers of real estate can have this effect due to scale).

In the light of EU level developments regarding the circular economy, it can be expected that ultimately, all building permit processes will include references to circular building materials. However, this is not currently the case for the ReCreate pilot project countries. Furthermore, the building permit is not necessarily the final step in the process. During the construction process there may be inspections by the relevant authorities, which may prompt a need for further documentation by the project developer. The (de)construction processes also have links to work safety issues and the requirements for safe use of heavy machinery, such as cranes. These issues also require information from within the building company. For example, what is the exact deconstruction plan and how have engineers envisioned the process? How is the deconstruction company going to execute it and does it have comments on the plan, which may arise through previous experience? Therefore, the policy process shapes to a large extent of the information flows between the two coalitions, but at the same time can also present a challenge.

### 3.4. Risks, challenges and consequences for coalitions

Especially in the construction sector coalition, there may be a risk towards exclusion of small firms or self-employed people. The redesign of processes leading to a construction permit that complies with regulations while using reused materials may require some specialized equipment. According to Bilal et al. (2020) there are several barriers that link to information exchange, human resources and costs. Small firms and self-employed people may not have the capital needed for this equipment. Market entrance may be restricted through the need for certification and ISO standards. Hossain et al. (2020) provide an in-depth literature review of trends, challenges and consequences, which should be taken into consideration. On the other hand, the need for analysis and data on materials could also provide an incentive for growth in this specialized sector. The compliance with standards and achieving certification (e.g. on environmental performance via LCA) may provide a competitive asset, especially for SMEs (Prieto-Sandoval et al. 2019).

Key challenges with regard to building policies (e.g. the building permit) are relatively easy to identify. Table 1 shows these challenges with an indication of the spheres they might be resolved in. To some extent these are comparable to Hossain et al. (2020) but connect the challenges with actors and needed information. Table 1 lists key challenges for both coalitions on a general level. Each of these challenges can be connected to specific issues that link both coalitions in a policy process. The key challenges are listed in a general way, since their practical effects depend on the jurisdiction. Furthermore, many of these challenges require interaction between the coalitions. In most cases building permit processes allow pre-process negotiations or deliberation. This deliberation is also a key source for knowing what information is needed and in what form, to what end. Further on in the project, Table 1 will function as an instrument to categorize data on the various flows of information in and between coalitions.

There are clear consequences of these challenges, especially if they are not resolved. Hossain et al. (2020), in their literature review, list the numerous challenges related to implementation of circular economy actions, but specifically to policy issues, stating (p. 10): 'Governments should establish relevant criteria for business including incentive measures, guidelines for remade/redesign products, and establish CE [circular economy] strategies and policies for promoting CE in wider application.' This challenge is fleshed out in their article, but underscores the need for a sensible policy environment, in which there are many flows of information necessary (Winch 2002; Weible et al. 2021). The consequences of the challenges are evident: they result in delays, failure to obtain permits, unsuccessful project management, wasted capital and other less concrete effects. And more importantly: continued use of virgin materials, increased emissions and increase of preventable waste.

COALITION	CHALLENGE	INFORMATION/ CONTENT	SPHERE	TIME HORIZON
Construction project coalition	Construction information	Internal data sharing	Construction project coalition	Project phases
Construction project coalition	Material quality	Measurements	Construction project coalition and translation to policy coalition	Project phases
Construction project coalition	Environmental aspects (LCA, other)	Measurements, assessment	Construction project coalition and translation to policy coalition	Project phases
Policy coalition	Legal requirement basis	Policy-making resulting in permit	Local and (trans)national authorities, back to construction project coalition	Depends on demand for certainty
Policy coalition	Building code requirements regarding construction safety	Policy-making, certification, resulting in permit	(Trans)National authorities, external certification bodies, back to construction project coalition	Depends on information required
Policy coalition	Building code requirements regarding environmental effects	Policy-making, certification, resulting in permit	National authorities, external certification bodies or environmental assessor, back to construction project coalition	Depends on information required

Table 1. Key challenges

## 4. Conclusion

This guide to coalition building focuses on a few of the aspects that arguably are vital for a circular building project to successfully attain a building (or deconstruction) permit. I argue there are two distinct coalitions, the construction project coalition and the policy coalition, each with its own members, information production processes and links to external actors. It is argued that in building permit processes for the circular economy, these two coalitions are interacting and have a mutual need for information. The current uncertainty regarding the 'correct' criteria against which to assess circular building solutions implies frequent interactions, deliberations and co-operation between the coalitions, in order to achieve social consensus on a variety of technical aspects of the construction project.

Within the coalitions, there is a great need for deliberation on the need for information or data, either functionally in the circular chain or outwards towards the aim of the building permit, which also includes the interpretation of relevant legislation. The policy coalition features these kinds of internal discussions and outreach to other authorities or experts, but these discussions may, depending on the local authority, take place in a more compartmentalized fashion. For this reason, various scholars have emphasized the importance of the integration of climate mitigation policies in the organization as well as stressing information needs and flows. The empirical study of the policy environment in the ReCreate piloting countries will show to what extent this integration has taken place and how this affects decision-making on building permits for the ReCreate pilot projects.

Currently, for most of the ReCreate project countries, the policy environment is in flux. In that sense it cannot be studied yet how policies promote the goals of ReCreate. It is possible, because of the challenges mentioned above and in Hossain et al. (2020), that there will be delays – either on technical aspects or policy-related aspects. They argue (p. 7) for a comprehensive framework for the circular construction sector. As is expected, the framework involves many actors, many technical solutions and innovations as well as the incorporation of policy and business models. This Guide to Coalition Building can contribute to a focused, coalition-based approach to the challenges of the circular building economy. The Guide to Coalition Building sees information flows as essential glue to and between coalitions, not only for the specific goals of ReCreate but in a much broader sense: the challenges may be local, but solutions could be scalable through smart policy solutions.

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