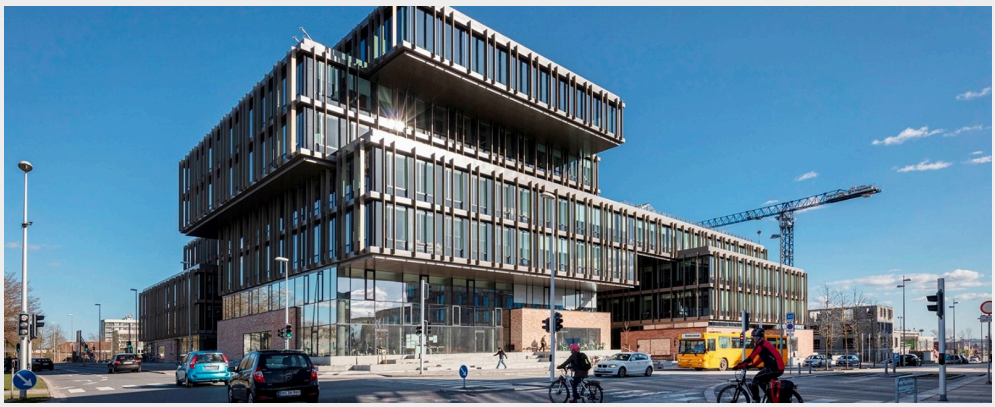
POLICY BRIEF

Strategies and methods for implementing CE in construction activities in the Nordic countries

Nordic Council of Ministers



Strategies and methods for implementing CE in construction activities in the Nordic countries

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This Policy Brief is results of a project initiated by The Nordic Working Group for Circular Economy (NCE) under the Nordic Council of Ministers (NMR). The whole report can be read here.

Contents

The transition to a circular economy

The implementation of a circular economy (CE) in the construction sector offers significant possibilities for saving natural resources and energy, as well as reducing greenhouse gas emissions. Construction and demolition waste (CDW) is the largest waste stream in the EU, and although EU countries are on track to fulfil the 70 % recovery target of 2020, recovery is largely based on backfilling and low-grade recycling.

In a circular economy, raw materials are not taken out of their cycles, but they remain in the economy for as long as possible through efficient and smart use. The circular economy, however, involves much more than just recycling; it requires the fundamental rethinking of value chains and business models, of product design and the overall economic systems in which they are applied. In construction, this would mean that buildings and construction elements are designed to be easy to adapt, easy to dismantle, and are hardly ever demolished. Building materials or building elements would also be quickly and efficiently reused, which again would result in high-quality materials being maximally utilized in a closed loop and almost no material would end up as waste. To close the loop, it is important to focus on the whole value chain, where some of the phases are keys to waste prevention and keeping the materials in use for as long as possible, while others are necessary when the constructions have met end-of-life and the materials and products must be reused or recovered.

We know that the successful implementation of a CE is hampered by many barriers associated with different phases in the value chain. The implementation of CE concepts often requires prioritisation, as not all solutions are ready to be implemented, but require new business models and need to be adapted on a case-by-case basis. In the project, 14 cases were chosen for analysis on how local CE strategies have supported their business models. A presentation of the cases in the value chain of the circular construction sector is illustrated in Figure 1. As can be seen in the figure, the CE cases have a high focus on reuse and recycling. Reuse is mainly focused on surplus materials and interiors, while reuse of structural elements does not occur to a large extent today.

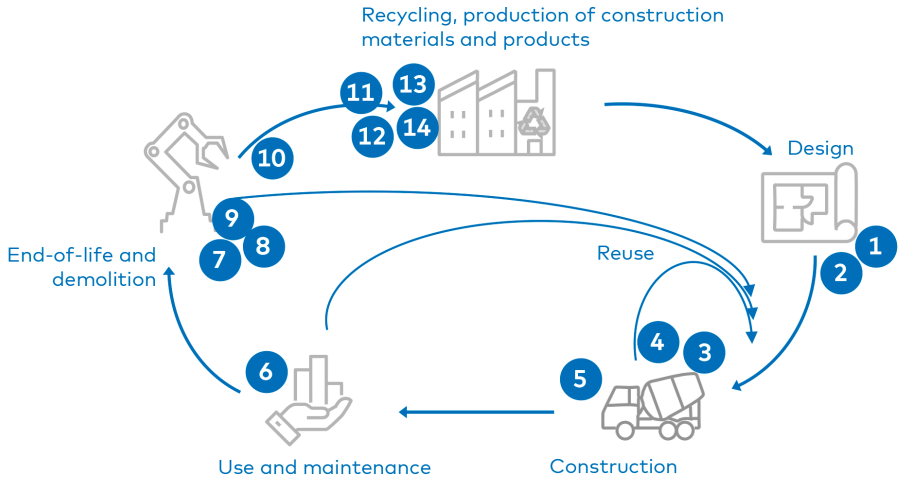

Figure 1. 14 cases were presented in the project where they all contribute to a rethinking of the traditional value chain and aim to form a loop, where the life span of buildings is increased, the products are efficiently reused, and the materials are recycled.

The key findings on the enablers and barriers to the CE in construction and demolition

Local CE strategies to boost a circular economy

The circular economy in the construction and demolition sector is addressed in national and local strategies. Compared to national strategies, local strategies contain more detailed practices and responsibilities for reaching targets, with a more practical follow-up system for ensuring realisation of set targets such as planning and requirements for public procurement. In the cases analysed, we could see that many business opportunities seem to have been created through the influence of national and local strategies. We have identified examples where local strategies have supported CE solutions in constructions in the municipalities. We also observed that several local strategies focused not only on the circular economy aspect, but also on climate effects.

Enablers	CE strategies can be a good means for setting theory into practice and supporting the transition towards a circular economy in the construction business. Use of green public procurement (GPP) both for construction and demolition work is a tool to support the reuse and recycling of construction and demolition waste. Especially GPP in construction promotes closing the loop. Decisions on concepts and materials are taken at early stages in procurement, strategies have an impact in the early stages and enable CE solutions.
Barriers	Lack of concrete actions and responsibilities prevents strategies from being implemented.
Policy recommendations	For implementation of CE goals, guidance documents and especially concrete criteria are recommended to support achievement of CE solutions in practice. Requirements for green public procurement (GPP) create a market pull and promote closing the loop Requirements for waste auditing also covering resources mapping and selective demolition should be mandatory

Digital tools to boost a circular economy

In the construction sector, digital solutions are applied as tools to boost a circular economy via reuse and high-grade recycling. Digitalisation is seen as a facilitator for the transition to a CE; however, digitalization cannot stand alone as several framework conditions are just as important. Although the type of digital system in use is important, the reliability of data still depends on several other factors, e.g. how waste data is collected or reported, information on generated or treated waste, and quality of waste streams. The level of digitalisation is generally low in the construction and demolition sector in the Nordic countries, and many digital solutions are at early development stages. Documentation of CDW flows and development of national waste statistics are conducted differently in the Nordic countries. Digital solutions offer possibilities for improving the reliability of waste statistics, which are the basis for monitoring and regulatory actions and decisions for new activities and financial investments.

Enablers	Initiatives to increase the level of digitalisation, which enables documentation of waste flows and enhances treatment of CDW. All Nordic countries have or are going to introduce digital platforms for building and demolition permission applications. Traceability of waste enables meeting the quality requirements for recycling and reuse. Digital marketplaces facilitate new business models within reuse and recycling.
Barriers	The digital system highly depends on stakeholder acceptance to be effective. BIM (Building Information Modelling) is lacking in old constructions.
Policy recommendations	Development of digital competences in the entire value chain

Technical specification and CE-marking of recovered materials

Establishing an effective circular economy is closely linked to bridging the gap between the waste and building sector, which in turn is closely related to requirements for documentation and technical specifications of materials. When looking more closely at the rules and standards for the technical documentation of building materials, it is important to distinguish between reuse and recycling of materials.

Enablers	CE-marking provides a uniform system for documentation and testing. Use of certification and end-of-waste status improves quality and trust for recyclables.
Barriers	The Construction Products Regulation does not cover reuse, which means that the harmonised standards linked for CE-marking are usually not applicable for reusable products and structures. In many cases, also the harmonised standards exclude recycling. End-of-waste status is not achievable for all materials, and there is still a lack of experience in the Nordic countries.
Policy recommendations	An increase in markets for reusable products is expected, but this calls for actions for clarification on rules for CE-marking and other, alternative solutions for documentation – an effort that could benefit Nordic stakeholders. Securing that the Nordic aspects are considered in the revision work of the Construction Products Regulation and linked harmonised standards for CE-marking.

Supporting and improving quality

Doubts about quality is a key barrier to recycling. Concerns about the quality and potential presence of hazardous substances lead to a lack of confidence or trust in the recovered waste streams. The required quality of the recovered material depends on the application. Typically, high-quality materials are needed for high-grade recycling.

Enablers	Certification of recovered materials, traceability systems and end-of-waste status are means of fulfilling requirements on quality and supporting the market for recovered and reused materials and products.
Barriers	Currently there is little information on achievable criteria under realistic conditions related to reuse and high-grade recycling. This information would support the preparation of procurement documents.
Policy recommendations	Promotion of end-of-waste and certification concepts. Guidance on procedures for assessment of suitability of end-of-life products and materials for reuse and recycling is needed, both on the technical and environmental properties of recovered materials, as well as including potentially harmful substances that may be present from the use phase.

Business models for reuse

As the reuse of building materials is still in a nascent period of development, there is a large potential to streamline the reuse processes to make easily accessible reusable products more competitive compared to building products based on virgin materials. This includes increasing the awareness and competence, considering reuse aspects earlier in the processes, conducting continuous and comprehensive reuse inventories to increase the supply of reusable building products, developing more efficient reverse logistic solutions, and providing storage solutions, etc.

Enablers	Reuse aspects must be considered early in the renovation process, since they require a longer lead time as well as new ways of working which takes time and effort to learn and implement. Market places for reusable materials to connect supply with demand.
Barriers	New products are considered by many stakeholders as cheaper and better than recovered products. There is often a lack of timely information among stakeholders about generated materials and components that can be reused.
Policy recommendations	Funding systems for start-up companies.

Market pull – Policy instruments to support market uptake

Markets for recycled materials depend on the quality, the price and the material availability. In many of the cases, it was concluded that the main obstacle for reuse and recycling is the low price of competing virgin materials (e.g. aggregate, wood, glass and gypsum). In Finland and Sweden, especially the abundance of wood and aggregate limit the interest in recycling of these materials. Furthermore, the sorting and processing needs of demolition waste to secure high-quality material for recycling or dismantling for reusable products increase the demolition costs.

Enablers	A market pull can be facilitated by enacting legislation to promote reuse, such as the requirement of using a minimum amount of reused building products in new constructions. Potential economic drivers to direct construction and demolition for reuse and recycling are green public procurement, the taxation of virgin material, landfill taxes, and landfill ban on recyclable materials. The introduction of policy instruments such as sanctions or fees as well as subsidies to promote reuse need to be further considered. Green public procurement such as the requirement on reuse of construction products or recovered material contents in new products used in construction will increase the market value of the recovered materials. Effective identification, sorting and collection of construction and demolition waste can support the security of supply of the right kind of materials and thus enable the establishment of markets for reused and recovered materials. Material-specific recycling targets for construction and demolition waste would be a driver for increasing the supply of secondary raw materials.
Barriers	An identified challenge for the implementation of CE concepts is related to the market´s readiness; it can be difficult to find the right materials that could meet the requirements and expectations if the market is not ready. Lack of security of supply is a barrier; constructors may have difficulties to find acceptable products and materials suitable for construction.
Policy recommendations	The focus is on policy instruments as enablers, all enablers are considered policy recommendations.

Reuse and recycling targets and indicators

Achievement of CE targets in waste management is often measured based on recycling rate which is calculated as the ratio of recycled waste amount to generated waste amount. There is no distinction between preparation for reuse, high-grade recycling, and down-cycling (including backfilling). The Waste Framework Directive sets a target of recycling 70% (by weight) of non-hazardous construction and demolition waste. The Commission shall consider by 2024 material-specific targets for key streams. A recycling target for an entire industry creates incentives to recycle materials that have a large impact on the target and risks reducing the incentives to recycle materials that have a small impact.

Enablers	An Extended Producer Responsibility (EPR) for construction products and/or materials would promote material specific recycling. In recycling, it is important to consider the quality aspect and distinguish between low-grade recycling and high-grade recycling; there is also a need to assess the need for new environmental indicators (e.g. resulting in climate and resource savings).
Barriers	Waste prevention is not included in statistics, and there are currently no indicators for waste prevention; inclusion of waste prevention in environmental reporting would support CE goals. Current recycling target for non-hazardous construction and demolition waste creates incentives to recycle materials that have a large impact on the target, and risks reducing the incentives to recycle materials that have a small impact.
Policy recommendations	Nordic input to the European Commission on the definition of material-specific targets, with special focus on how the waste hierarchy can be better implemented. This means distinguishing between waste prevention, reuse and high-grade recycling from down-cycling, backfilling Material-specific targets incentivise recycling of other than mineral waste

About this publication

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Nordic co-operation is one of the world's most extensive forms of regional collaboration, involving Denmark, Finland, Iceland, Norway, Sweden, and the Faroe Islands, Greenland and Åland.

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