

# Business Cases for Circular Construction & Demolition Projects

## CDW - Co-developed by CityLoops WP2 Partners

Led by the Danish Association of Construction Clients, Denmark

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### Description

To support the economic viability of the circular economy demonstration actions in CityLoops, generic and project-specific business cases will be developed to promote reuse, recycling, and revalorisation of CDW. The business cases will take into consideration the 'product' (secondary construction material quality, quantity, technical and environmental properties), an analysis of market possibilities (risk management, stakeholder involvement, cost-benefit analysis), incentives to support demand (procurement procedures), and an economic assessment (using lifecycle cost or total cost of ownership), and will include a description of execution with a marketing plan.

#### Keywords:

- #Business models (in a circular market)
- #Business cases
- #Implementation

#### Target user:

- Local governments - (e.g. departments of buildings & infrastructure, environment, urban development, waste management, economic development)
- Businesses - (e.g. construction & demolition contractors, building & infrastructure owners, waste treatment)
- Research institutions

#### Format:

- A generic circular market description and business case template will be the basis for the business cases developed for each demonstration action in CityLoops. All will be documented in a final report in English.

### Development

The circular economy is challenged in the transition from the linear economy in the way that the structures of the market and its actors must adapt to a new reality. The challenges lie in defining new market roles, identifying, and eliminating uncertainties and risks, calculating, and determining new price structures - and redefining material flows and distribution channels. This does not occur by itself but requires the dissemination of knowledge and the introduction of various regulations.

The conventional (linear) market is based on the philosophy of supply and demand and a notion of economic growth, based on unlimited amount of and access to resources. The easier access to virgin

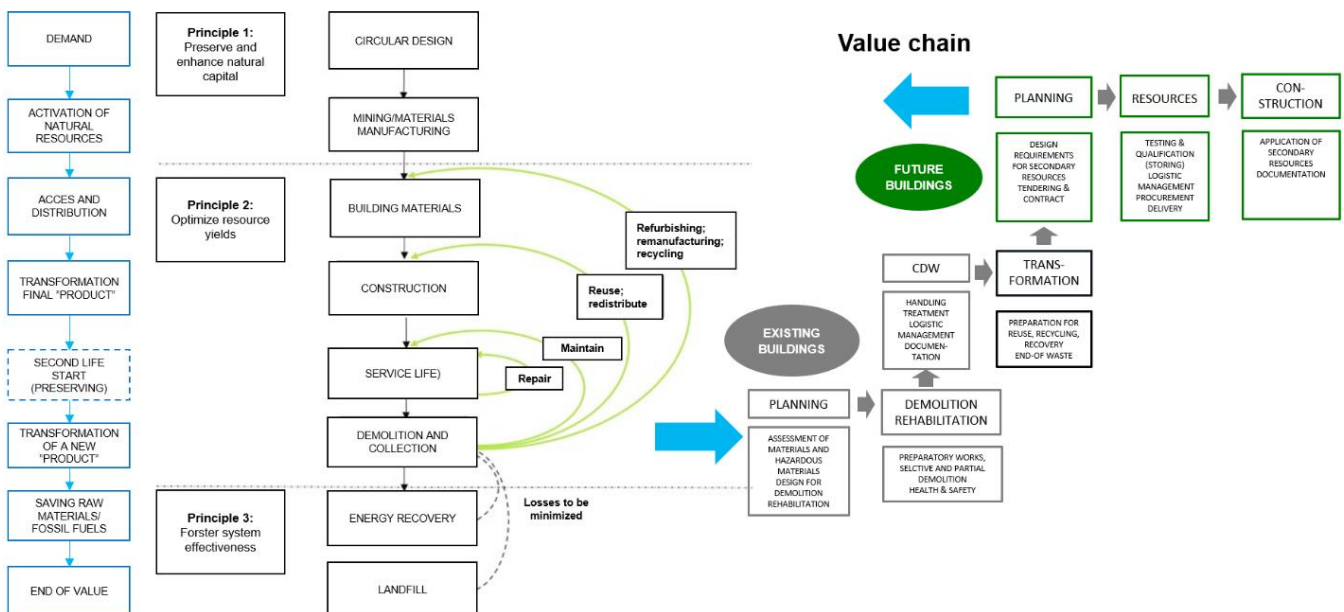


raw materials and the lower the extraction and production costs, the more competitive prices. Due a fine-mesh system the distribution costs are relatively low and will typically play a limited role in pricing. Simplified, the value of a material will correspond to the market's perception of a competitive price - and to a lesser extent depending on quality and initial costs. If a material can be extracted, manufactured, and disposed of without regulation in the form of e.g., environmental and waste taxes, which reflect the negative effects on the climate and the environment during the process, the value of the material and thus price will simultaneously hide the real social and environmental costs.

The circular economy is similarly based on supply and demand - and access to resources, but in this model the growth will to a greater extent be based on the notion that many of the natural resources are limited (or must be limited due to of imbalance between population growth and resource consumption), and that the market economy is therefore replaced by a “closing-the-loop model”, where the life cycle of materials (products) is extended, primarily through a more environmentally friendly design that makes it easier to repair reuse, reuse and reproduce old products, improved durability, better waste management that preserves the materials in one or more loops, and new business models based on leasing, sharing, repair and recycling.

An important part of the transition from linear economy to circular economy is thus to ensure that there is a decoupling between economic growth and production of waste, which is written down to the value zero when the material or product has ended its first use. Another significant effect of recycling material is that they often require (fossil) energy to extract and manufacture and thus create an increased CO2 footprint to the detriment of the climate. And this is an example of a negative effect which generally not is capitalized and thus price-forming.

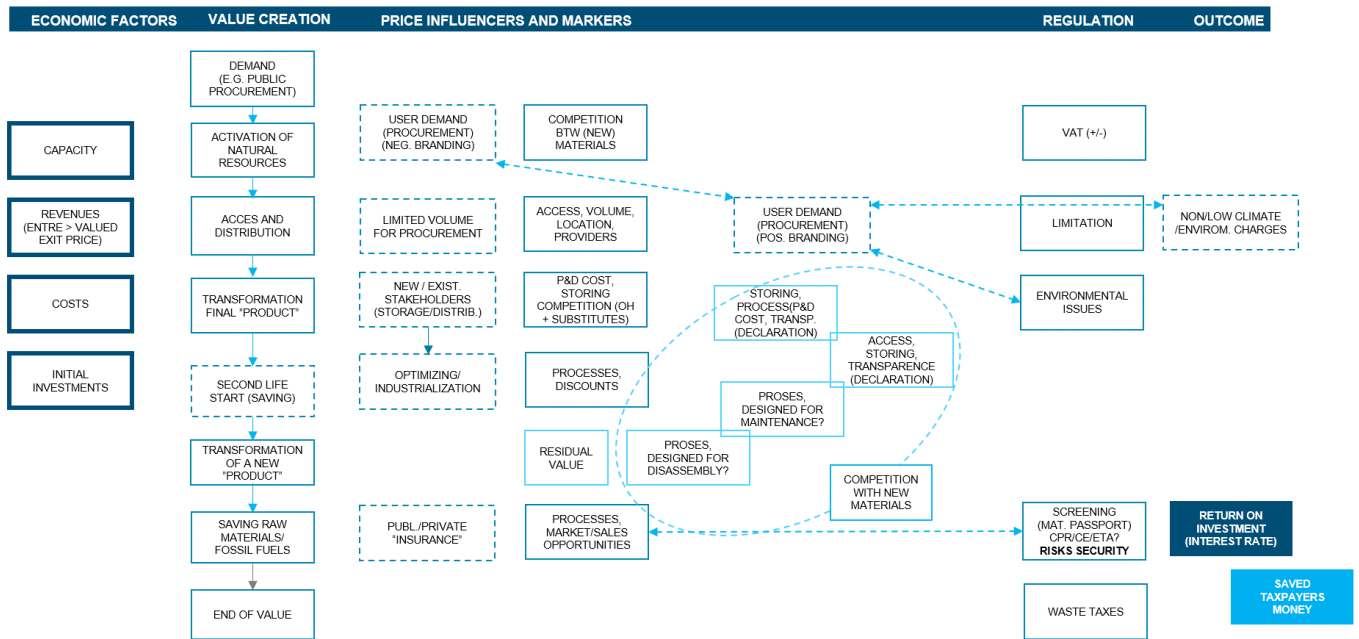
Based on a value chain approach and a review across existing circular economy models in the construction sector in Europe, a **generic circular economy model has been described to define the market framework and the crucial elements of the generic business case**. The framework has been presented to City Loops cities, and each of them will further develop selective focus areas according to their demonstration projects. **Value creation (market drivers):**



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The business cases are different with different stakeholders and each of the demonstration cities have their own approaches in the early stage of development and extension of the circular market. The business cases reflect this in the interaction between the public stakeholders (including both the authorities and the building owners) and the private stakeholders with commercial interests. Nevertheless, all cases must define the individual options and barriers based on the market influence factors – which includes e.g., value chain elements, price influencers and markers (incentives) and potential regulation.



Individual business cases will be developed and described in relation to the demonstration projects in CityLoops cities, based on the generic market model above and a generic **society-market-business-model** below, including value creation (costs, revenues and benefits), resources, activities, stakeholders/partners, customers, marketplaces, and savings and risks.

		MATERIALS/PRODUCTS		INITIAL INVESTMENT (COSTS)			RETURN OF INVESTMENT (REVENUES)	
MARKET		SCREENING FOR CATEGORIES (R's FOR CIRCULARITY)	RECONIZED CAPACITY	HANDLING AND TRANSPORTATION	TRANSFORMATION	MATCH-MAKING, MARKETING & SALE		CUSTOMER, CLIENTS, END USER
	REVENUES		ENTRY PRICE (VALUED CDW/SOIL)				EXIT (MARKET) PRICE	
SOCIETY	BENEFITS		MINIMIZED ENVIRONMENTAL IMPACT		LOCAL JOB CREATION / SOCIO-ECONOMIC ACTIVITIES	ENCOURAGED CIRCULAR ECONOMIC		CUSTOMER, CLIENTS, END USER
			POT. CHARGES		POTENTIAL PUBLIC STORING		SAVINGS & RISKS	
				INCOME AND CORPORATE TAXES				



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Based on the business cases a **generic marketing plan**, useful for the demonstration projects, is developed. The marketing plan guides the owners of the secondary materials to reach the P2B/B2B-market with advertising, ads, PR-materials, platforms/channels, network, etc.

### Barriers:

The main barriers of realizing the market and business models respectively the marketing plan will mainly be

- structural barriers, such as uncertainties regarding ROI for investors and legislation/ regulation as if CDW is considered as waste and not products, and no standards of quality or use will increase the risks, and
- (local) market conditions, such as limited secondary resources, limited numbers of consumers of the CDW, lack of sufficient incentives by potential procurers and absence of functioning marketplaces.

The expectations will be that the planning and decision-making tool among others developed in CityLoops should contribute the market development, but the structural barriers require national and/or local political initiatives.

## Deployment

Both the generic business case model(s) and the marketing plan are expected to be used by each CityLoops city and locally tested as demonstration actions, but also further developed beyond the demonstration phase. The business cases will be key to regional upscaling of the piloted solutions.

## Replication

The results of the task; Business Cases for Circular Construction & Demolition Projects is expected to be compatible to other cities beyond CityLoops, as well as other comparable contexts, but may require adjustments related to local political and market conditions. To increase the market, establishing of stakeholder partnerships and market dialogue is recommended. These elements are crucial to reduce or eliminate economic, environmental, and social issues.

## Additional Information

European Environment Agency: [Construction and demolition waste: challenges and opportunities in a circular economy](#) (2020)

Lauritzen, Erik K.: Construction, Demolition and Disaster Waste Management: An Integrated and Sustainable Approach (2020)

Julia L.K. Nußholz, Freja Nygaard Rasmussen, Leonidas Milios: [Circular building materials: Carbon saving potential and the role of business model innovation and public policy](#) (2019)

Patrizia Ghisellini; Sergio Ulgiati: [3 - Economic assessment of circular patterns and business models for reuse and recycling of construction and demolition waste](#) (p. 31-50) (2020)

Rutger Oorsprong: [Circular Economy in Construction: Opportunities for Sweden and the Netherlands](#) (2018)



Schuelaar & Partners, SeRaMCo mid-term conference: [Circular Business Models in Practice](#) (2018)

Alexandre Joyce; Raymond L. Paquin: [The triple layered business model canvas: A tool to design more sustainable business models](#) (2016)



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