

Interreg 2 Seas Mers Zeeën
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Calculating the Circular Value of Remountability

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October 1, 2

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 - Focus on the economic aspects of Circular and Biobased Building
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Content

- Introduction
- Method
- Results: 2 calculators
- Guided use of the calculator
- Q & A
- Wrap up

WHITE PAPER Five essentials for successful circular bio-based construction initiatives

- Affordable** Did we search for cost-effective & inclusive reuse?
- Flexible** Did we look beyond the current needs and prepare for future functions and users?
- Passive** Did we search for passive ways to stay cool & healthy with bio-based materials?
- Integral** Did we broaden our perspective and continuously reflect on the financial and non-financial benefits of circular bio-based construction?
- Traditional Ownership** Did we keep ownership as simple as functional?

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Introduction

- Alternative business models have a hard time setting foot in the construction industry due to attractive interest rates of mortgages as well as the long life times of buildings
- The development of new buildings is a significant investment for property owners and developers. As a result **caution is naturally taken to stay within budget and reducing costs**
- Despite of the focus on costs, **the value of circularity is often discredited during decision-making**. With the calculators we try to give circularity a stronger vote in the decision-making process

Koster, M., Schrottenboer, I., Van der Burgh, F., Dams, B., Jacobs, L., Verschu, A. & Verdoordt, S. (2020). White Paper: Five essentials for successful circular bio-based construction initiatives. Circular Bio-based Construction Industry (CBCi)

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Circular Value Calculators

- Flexibility** can be used to keep the building functional to its users over its lifetime and make it potentially live longer. In the Netherlands a **building changes owner every 25 years on average** (Van Oort et al., 2008)
- For **End of Life** It is important to know that, the lifetime of buildings is generally very long (at least 50 years). With alternative ownership arrangements, suppliers take **risk premiums to compensate for the uncertainty** of being responsible for a construction over a long life (Koster & Schrottenboer, 2022). This usually gets **more expensive than a mortgage**

Van Oort, F., Ponds, R., Vliet, J. V., Amsterdam, H. V., Dieckers, S., Knober, J., ... & Weltevreden, J. (2008). Verhuizingen van bedrijven en groei van werkgelegenheid.

Koster, M. & Schrottenboer, I. (2022). Successful circular bio based construction initiatives: five essentials from case studies. 4th International Conference on Bio-Based Building Materials.

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Method

- Research question
 - Can we find relevant parameters for circular value calculations by doing?
 - What functional needs the potential users have?
 - How applicable is the outcome and how can this be improved?
- Case studies
 - desk research**
 - 8 co-creation** sessions with people involved in exemplary projects
 - In NL & BE (no comparison between countries)
 - 22 attendees** (of which 19 were unique)
 - People with an initiating role in Construction, such as Project Leaders, Architects, Controllers, Researchers, Constructors and Producers
- The calculators were **improved iteratively** during and between sessions

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Results

- We tested four different calculators and found out that **Flexibility & End of Life** were the most relevant and applicable topics for building initiators
- The other two calculators on **Failure Costs** as well as **Health** were harder to relate to circular and biobased building principles
- Through **trial and error** as well as discussion we went from a very basic calculator to a detailed one that is applicable to initiators with various backgrounds
- The calculator helps initiators to **make an informed approximation for value** and use this in communication and decision-making



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Where we come from...

FUTURE FLEXIBILITY - CIRCULAR CALCULATOR		
VALUE: FUTURE FLEXIBLE SCENARIO	Value	Source
Expected time you own the building	25 y	Van Dorp, F., Ronds, A., Vite
Chance the scenario is used within the 25 y		
Required investment of the building is not circular remountable		
Flexibility value (chance adjusted)	€	
INVESTMENT		
Total investment without remountability		
Additional investment preparing for remountability	10%	KU Leuven LI (see PH&E)
Cost for conversion to new scenario		
Flexibility investment (chance adjusted)	€	
RESULTS		
EXPECTED CASE	€	
Interest rate for the additional investment	2%	
Mortgage rates		
Flexibility annual conversion cost (chance adjusted)	€	
Flexibility annual value (chance adjusted)	€	
ANNUAL CASHFLOW	€	



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... and what the final calculators look like



- **General Parameters** that are needed calculate the other parameters
- **Investment Parameters** to approximate the investment you have done
- **Value Parameters** to calculate the value / revenue
- **Costs Parameters** Here the costs of the calculator topic are approximated
- **Results** The outcome is among others shown as a business case and NPV
- **Scenario's** Here you can create optimistic and pessimistic scenario's



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Conclusions / what we have learned

- **Benchmarks are helpful**
Benchmarks were a helpful tool to make decisions and relative estimates with more ease.
- **Seeing the impact is engaging**
Participants enjoyed being able to directly see the impact of changing a parameter to the outcome, such as Circular Value.
- **The iterative nature of co-creation worked well**
By the use of co-creation we could continuously reflect on the alterations as well as the applicability of the end result. A diverse group help to improve the qualitative value.
- **Some factors are more impactful than others**
The time-span, interest rate as well as prior investment have a relative large impact on the result.



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What's ahead

- Current calculators further improved and **tested with the broader construction industry** together with HZ- and Avans University of Applied Sciences.
- The **Health as well as Failure Costs Calculators can be developed further**. Other potential topics are Building-Life Extension, End of Life for Existing Buildings as well as Maintenance & Replacement Costs calculator.
- More focus on **true costs** since the financial dimension of the calculator is one of many aspects (climate, experiential value, scarce material use, etc.)
- Research the **lacking adoption of alternative business models** in the construction sector. Including a comparison to other industries
- Additional **validation amongst financial institutions**



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Let's start doing!

- Pick the calculator that is most interesting to you & scan the QR code or visit the URL



edu.nl/g6q6



edu.nl/bgh87



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What are your thoughts & questions?



This project has received funding from the Interreg 2 Seas programme 2014-2020 co-funded by the European Regional Development Fund under subsidy contract No 2505-036 CBJ.

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