

# CITYLOOP EXPERT WORKSHOP

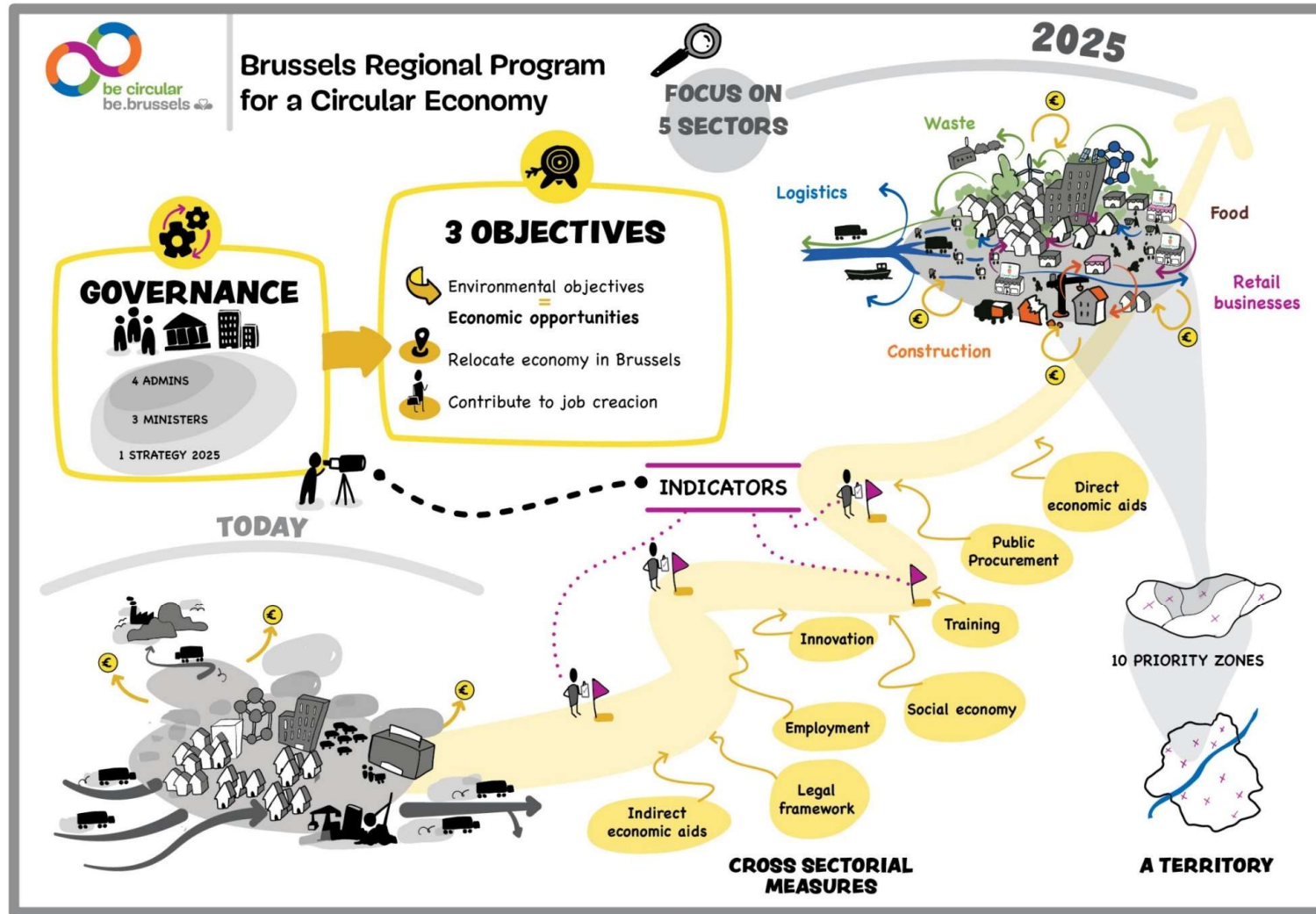
16 June 2021

## How can data support the transition to a circular economy?

Caroline HENROTAY – Brussels Environment



# Brussels Capital Region's Program for a Circular Economy





# Brussels Capital Region's PROGRAM for A circular economy



Source/Bron : PREC Construction



1%



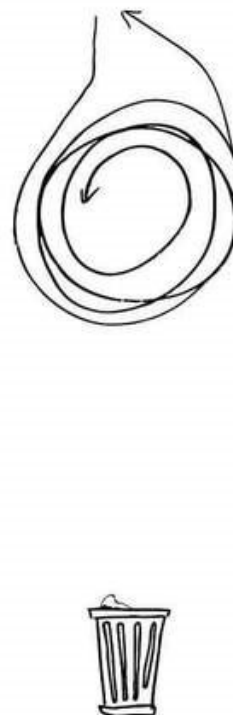
LINEAR ECONOMY



RECYCLING ECONOMY

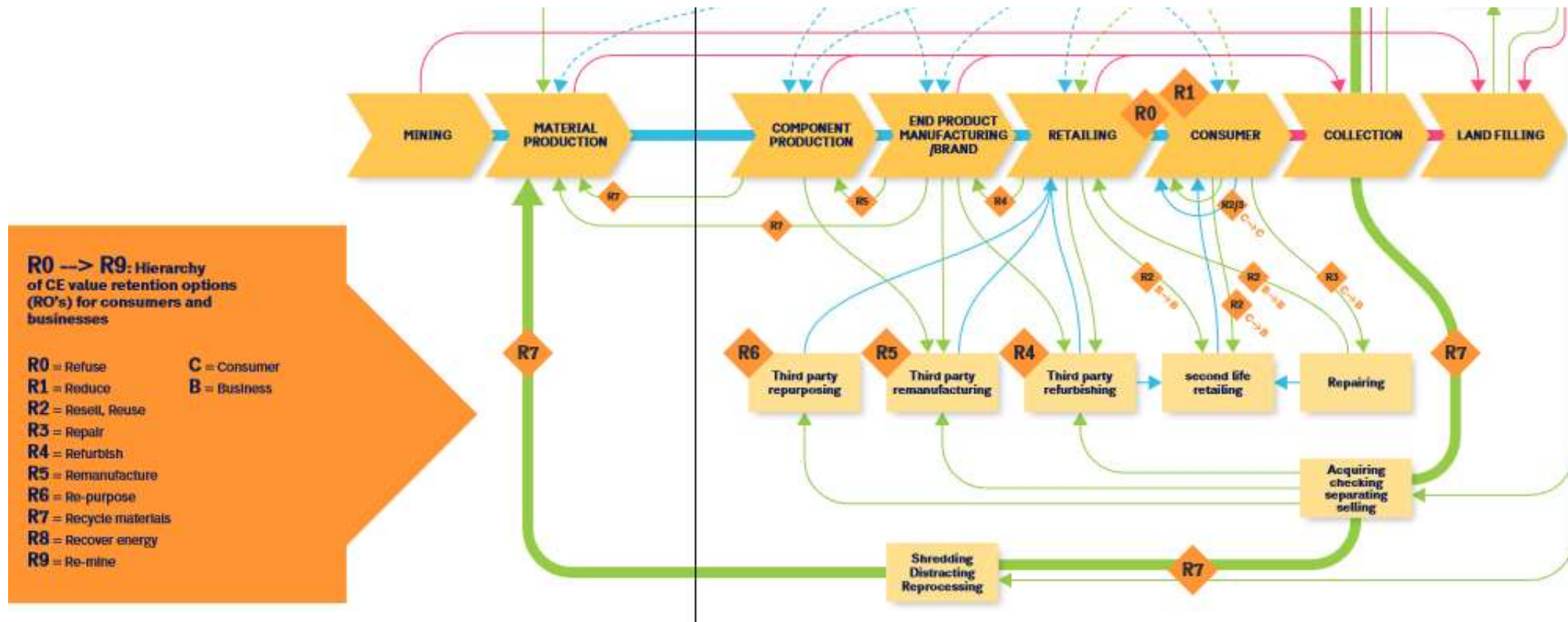


CIRCULAR ECONOMY





# Circular economy: from 3 R's to 10 R's



Bron: Circular Economy 3.0, Walter J.V. Vermeulen, Denise Reike and Sjors Witjes, 2019

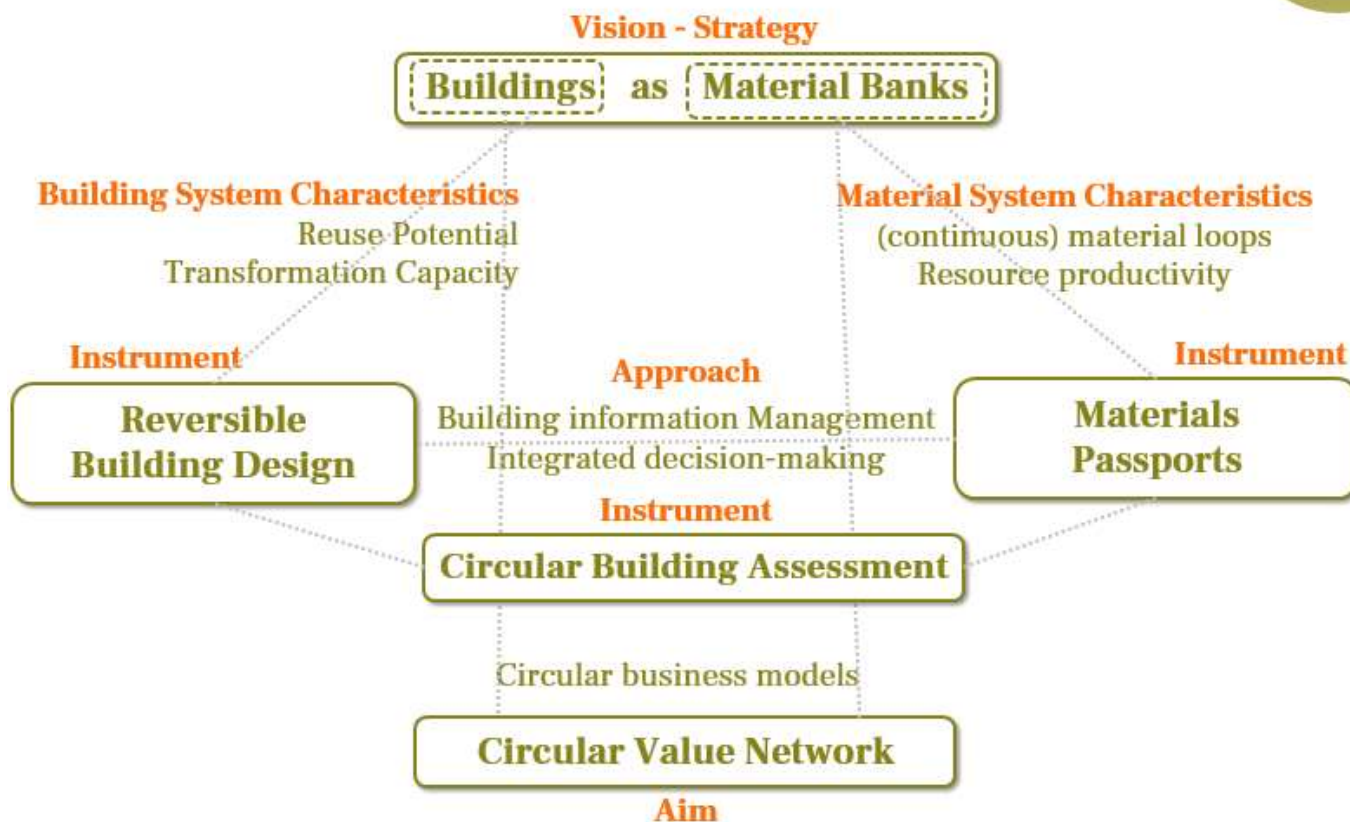
[https://www.researchgate.net/publication/335602859\\_Circular\\_Economy\\_30\\_-\\_Solving\\_confusion\\_around\\_new\\_conceptions\\_of\\_circularity\\_by\\_synthesising\\_and\\_re-organising\\_the\\_3R%27s\\_concept\\_into\\_a\\_10R\\_hierarchy](https://www.researchgate.net/publication/335602859_Circular_Economy_30_-_Solving_confusion_around_new_conceptions_of_circularity_by_synthesising_and_re-organising_the_3R%27s_concept_into_a_10R_hierarchy)



# Buildings As Material Banks



CASE STUDIES  
AND PILOTS



SIG 5  
POLICIES AND  
STANDARDS



bre



DREES &  
SOMMER



UNIVERSITEIT TWENTE.







# BAMB Material Passports



**COMPANY**  
EPEA Nederland

**PRODUCT**  
REMs  
Reversible Experience Modules

MATERIAL HEALTH ASSESSED

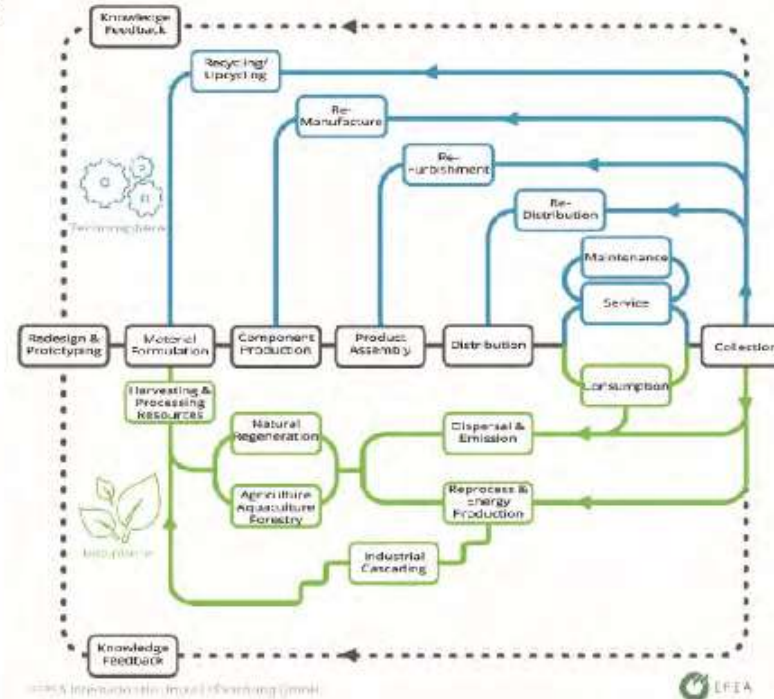
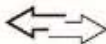
REVERSE LOGISTICS IN PLACE

(PARTS) DESIGNED FOR BIOSPHERE

(PARTS) DESIGNED FOR TECHOSPHERE

CONTAINS RENEWABLE CONTENT

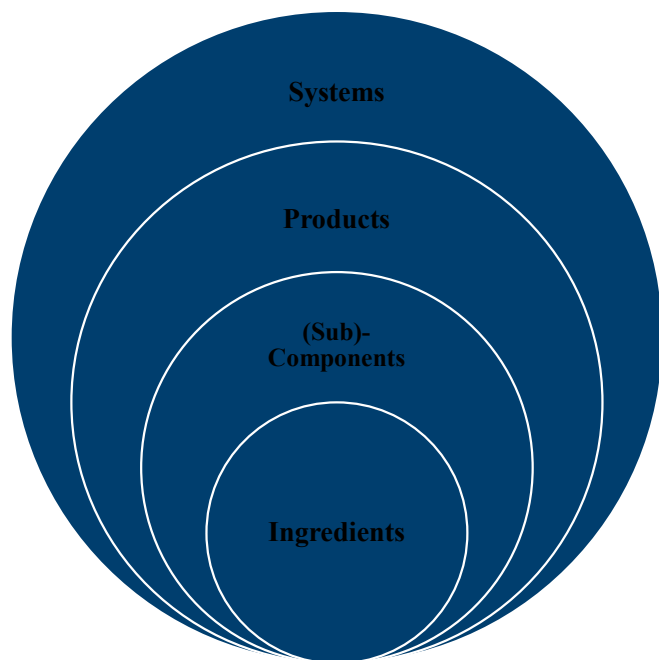
CONTAINS RECYCLED CONTENT

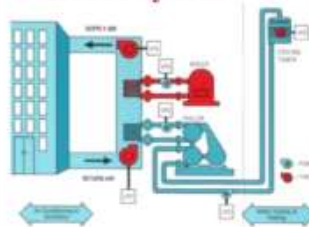








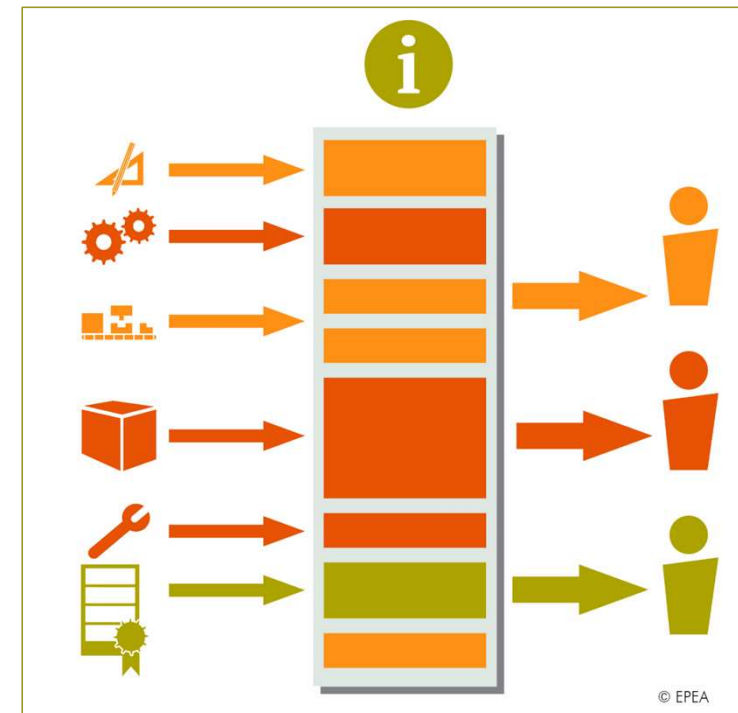
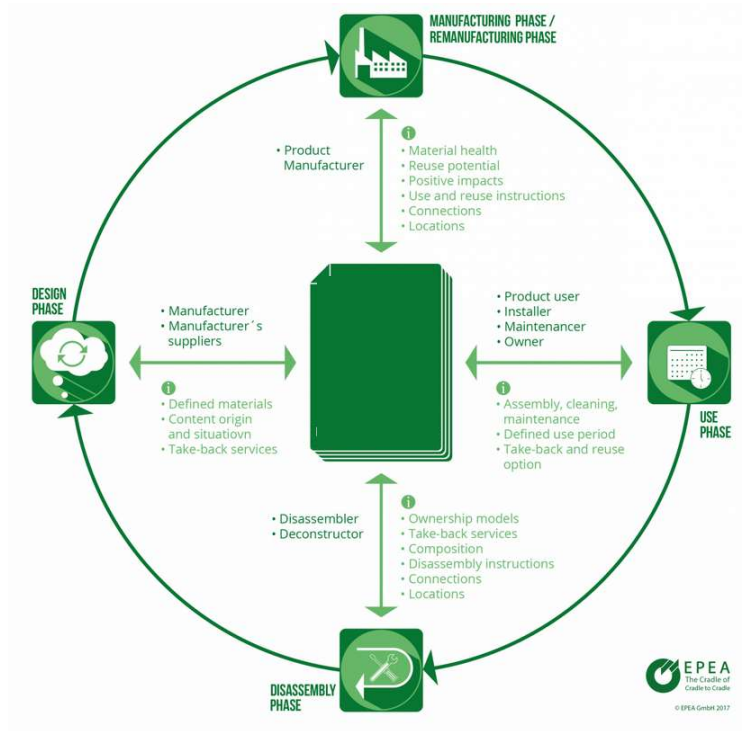
# BAMB Material Passports



Product composition breakdown	Example 1	Example 2	Example 3
System / Product	<b>HVAC System<sup>2</sup></b> 	<b>Office Chair<sup>3</sup></b> 	<b>Granite Flooring polished, no seal<sup>4</sup></b> 
Components level 1	<ul style="list-style-type: none"> <li>• <b>Chiller</b></li> <li>• Boiler</li> <li>• Fan</li> <li>• Ducts</li> <li>• Others</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Wheels</b></li> <li>• Leg</li> <li>• Upholstery</li> <li>• Seat Frame</li> <li>• Others</li> </ul>	<hr/>
Components level 2 (sub-component of level 1)	<ul style="list-style-type: none"> <li>• <b>Condenser</b></li> <li>• Evaporator</li> <li>• Pump</li> <li>• Others</li> </ul>	<hr/>	<hr/>



# BAMB Material Passports





# Overview existing initiative

- **Governments** - Supporting circular economy
- **Producer** - Circular design and management of products
- **Designers and engineering offices** - Tools for product selection
- **Building owners** - Circular management of buildings



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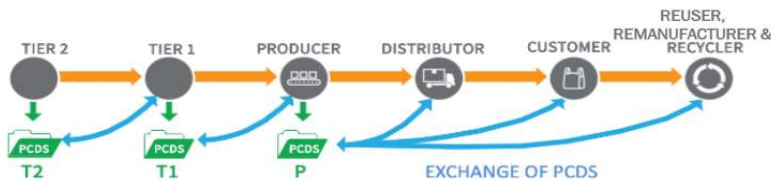
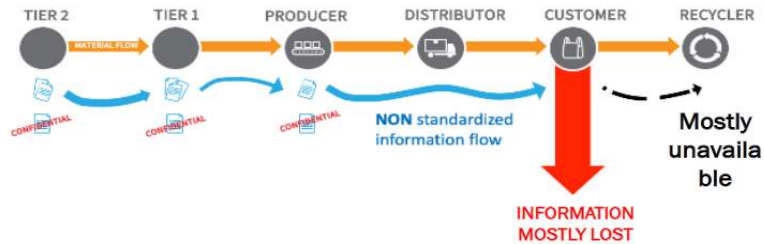
# Governments



- Supporting circular design, construction and renovation
- Setting the circularity targets
- Better knowledge of the building stock and its condition
- Better knowledge and management of material flows
- Support the orientation of policy measures
- Assess the circularity and sustainability of the built environment



# Governments



LE GOUVERNEMENT  
DU GRAND-DUCHÉ DE LUXEMBOURG  
Ministère de l'Économie

Direction générale du tourisme

## • Problem Statement

- Collecting circularity data is expensive, difficult and not standardized

## • Solution

- Standardized approach to share circularity data in each step of the value chain
- Development of a data template that contains standardized and reliable information on the circularity of a product
- **Focus on the development of an industry standard:**
  - align to a common language on circularity characteristics
  - support the design of circular & healthy products
  - Support implementation of cost-effective business models

<https://pcds.lu/>





# Governments



## Structure

SECTIONS	STATEMENTS (EXAMPLES)
 <b>GENERAL INFORMATION</b>	
 <b>COMPOSITION</b>	<p>THE PRODUCT CONTAINS &gt; 75-95 % POST-CONSUMER RECYCLED CONTENT BY WEIGHT</p> <p>THE PRODUCT DOES NOT CONTAIN SUBSTANCES OF VERY HIGH CONCERN FROM THE REACH CANDIDATE LIST IN CONCENTRATION ABOVE 0.1% BY WEIGHT</p>
 <b>DESIGNED FOR BETTER USE</b>	<p>THE PRODUCT CAN BE MAINTAINED &amp; REPAIRED BY UNTRAINED PERSONNEL AT THE LOCATION OF THE PRODUCT USE</p>
 <b>DESIGNED FOR DISSASSEMBLY</b>	<p>THE PRODUCT IS DESIGNED TO BE INSTALLED AND DEMOUNTED USING REVERSIBLE CONNECTORS</p>
 <b>DESIGNED FOR RE-USE</b>	<p>THE PRODUCT IS DESIGNED FOR RE-USE AS-IS OR WITH MINIMAL MODIFICATION</p> <p>THE PRODUCT IS DESIGNED FOR COMPOSTING IN A HOME COMPOSTER</p>

### SECTION 5: Design for re-use

#### Circularity pathways/scenarios – Product designed for ...

- 5000 The product is designed for re-use as-is or with minimal modification.
- 5001 The product has the CE mark.

- 5010 The product is designed for refurbishment.
- 5020 The product is designed for remanufacturing.

*Statements 5030-5037: only one statement can be true.*

- 5030 0% of the product is designed for recycling at the same level of quality. The remainder of the materials is foreseen by the manufacturer to be recycled at a lower quality than the original content.
- 5031 >0-10% of the product is designed for recycling at the same level of quality. The remainder of the materials is foreseen by the manufacturer to be recycled at a lower quality than the original content.
- 5032 >10-25% of the product is designed for recycling at the same level of quality. The remainder of the materials is foreseen by the manufacturer to be recycled at a lower quality than the original content.
- 5033 >25-50% of the product content is designed for recycling at the same level of quality. The remainder of the materials is foreseen by the manufacturer to be recycled at a lower quality than the original content.
- 5034 >50-75% of the product content is designed for recycling at the same level of quality. The remainder of the materials is foreseen by the manufacturer to be recycled at a lower quality than the original content.





# Governments

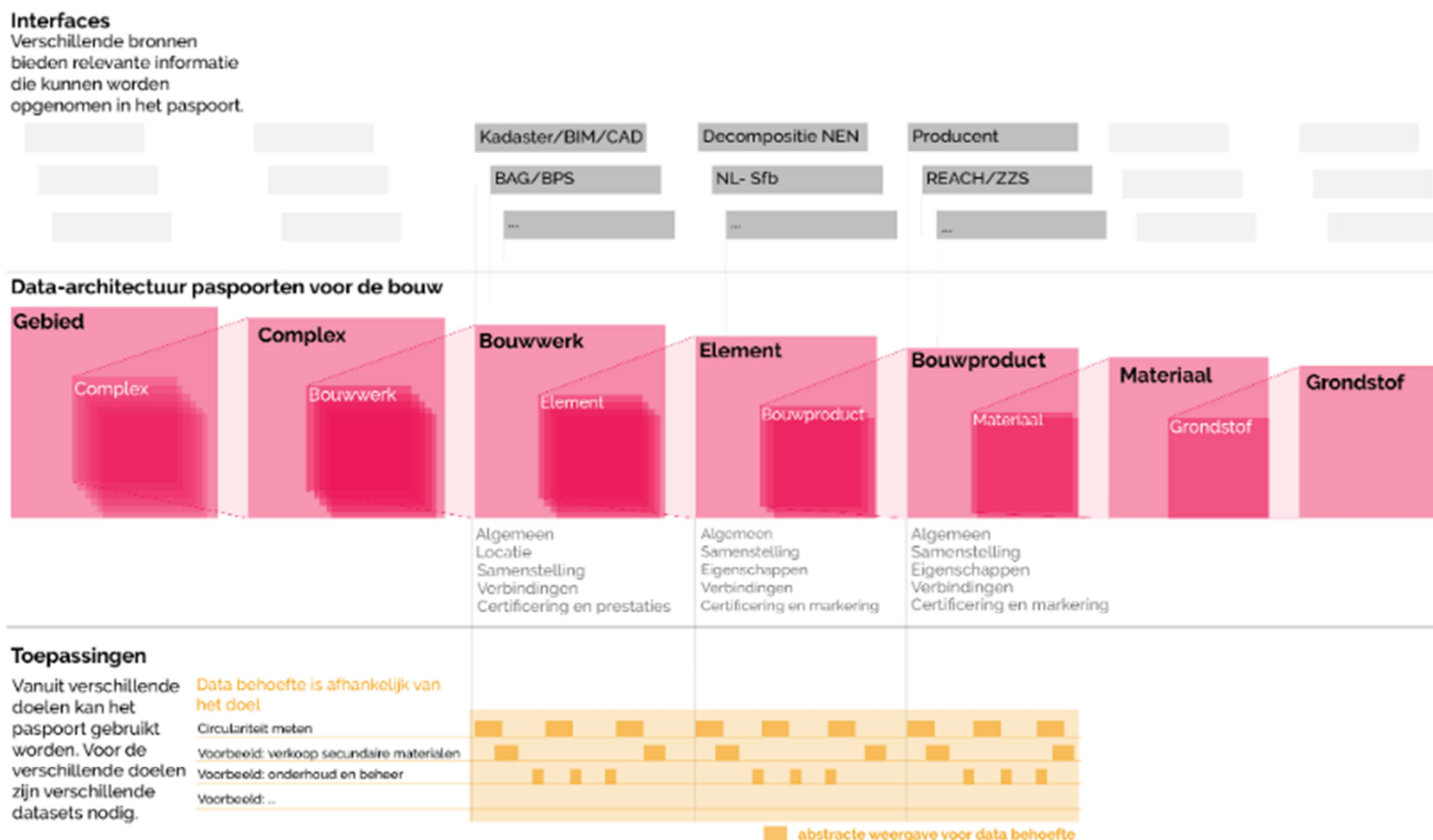




# Governments



Figuur 9 – Data architectuur voor paspoorten voor de bouw





# Governments



## Format paspoort voor de bouw

Object	Naam
Paspoortnummer	Fictief-03
Fase	Realisatie
Schaalniveau	Bouwwerk



GWV of BenU	GWV/BenU	BenU	GWV
BenU Type element: volgens SFB	Bike		
GWV type element: volgens decompositie NEN 2787	Forest		
<b>Algemeen</b>			
Eigenaar Bouwwerk	Naam, straatnaam, huisnummer, postcode, land		
Bruto vloeroppervlak	m²		
Bouwvergunning archiefnummer	123456		
Datum bouwvergunning	dd/mm/jj		
Datum oplevering	dd/mm/jj		
Afmeting - breedte	meter		
Afmeting - lengte	meter		
Objectnummer	egien/vervoerbijnde		
Restlevensduur tot (+ bepalingsmethode)	dd/mm/jj + tekst		
<b>Locatie</b>			
Geografische locatie Bouwwerk (GPS)	4F 100000 000000 4F 100000 000000		
Kadaster (of Geo identificatie)	KdZ, Agenc, Luchtopname		
Kadastrale aanduiding	Geometrie, Streekt, Perceelnummer		
Kadastrale oppervlakte	m²		
Publiekrechtelijke beperking	Recht, POF		
BAG ID	4F 100000000000		
BPS aanduiding	100000 000000 100000 000000		
RDS RijksDriehoekstelsel	X Y coördinaten		
Diepte/hoogte tov NAP	Z coördinaten		

## Samenstelling

<b>Elementenlijst</b>		E	E	E	Index, Tekst, Speed		
<b>Decompositie: Element a</b>					Tekst		
Elementpaspoort a (incl eigenaarschap)					NL 00000-000		
Hoofdstukken					00000/0000		
Plaatsing in bouwwerk							
Verbindingen element binnen bouwwerk					00000 00000 00000 00000 00000 00000 00000		
Beschrijving verbindingen (Element a met) bouwwerk					00000		
<b>Decompositie: Element b</b>					Tekst		
Elementpaspoort a (incl eigenaarschap)					NL 00000-000		
Hoofdstukken					00000/0000		
Plaatsing in bouwwerk							
Verbindingen element binnen bouwwerk					00000 00000 00000 00000 00000 00000 00000		
Beschrijving verbindingen Element a met bouwwerk					Tekst		
<b>Certificering en prestaties</b>							
<b>Energielabel</b>					A++ MVD		
Certificaten (LCA, MKI, MCI, MPG, EPD, BREEAM) + peildatum					PDF/MML		
NL-Greenlabel (buitenruimte)					PDF/MML		
<b>Overig</b>							
Potentieel (meest hoogwaardig) hergebruik + toelichting hoe					00000		
Tekeningen (doornedies, plattegronden, gewijs, constructietekeningen, constructieberekeningen, leidingaafdetekeningen en alle detailsingen)					PDF		



# Governments



## KERNMETHODE VOOR HET METEN VAN CIRCULARITEIT IN Bouwwerk-realisaatie

Informatie voor het beoordelen van adaptiviteitsaspecten

- Verbindingen element binnen bouwwerk
- Beschrijving verbindingen Element a met bouwwerk

A-Click, B-Schroef, C-bout/moer, D-Lijm,  
E-Schuif, F-Las, G-Haak, J-Klem

Tekst

Geschatte levensduur (SBK-bepalingsmethode)

- Restlevensduur tot (+ bepalingsmethode)

dd/mm/jjjj + tekst

Toekomstscenario's

- Potentieel (meest hoogwaardig) hergebruik + toelichting hoe

Tekst

## Element-realisaatie

Informatie voor het beoordelen van adaptiviteitsaspecten

- Verbindingen bouwproduct binnen element
- Beschrijving verbindingen bouwproduct a met element

A-Click, B-Schroef, C-bout/moer, D-Lijm,  
E-Schuif, F-Las, G-Haak, J-Klem

Tekst

Geschatte levensduur (SBK-bepalingsmethode)

- Restlevensduur tot (+ bepalingsmethode)

dd/mm/jjjj + tekst

Toekomstscenario's

- Potentieel (meest hoogwaardig) hergebruik + toelichting hoe

Tekst





# Governments



## Bouwproduct-realisatie

### Hoeveelheid

<input type="checkbox"/> Gewicht	kg
<input type="checkbox"/> Gewicht in percentage van totaal gewicht product	%

### Informatie voor het beoordelen van adaptiviteitsaspecten

<input type="checkbox"/> Verbindingen materiaal binnen bouwproduct	A-Click, B-Schroef, C-bout/moer, D-Lijm, E-Schuif, F-Las, G-Haak, J-Klem
<input type="checkbox"/> Beschrijving verbindingen materiaal binnen product	Tekst

### Herkomst materiaal secundair van hergebruik/recycling:

<input type="checkbox"/> Aandeel primair materiaal als percentage van totaalgewicht	%
<input type="checkbox"/> Aandeel hergebruikte deelproducten als percentage van totaalgewicht	%
<input type="checkbox"/> Aandeel gerecyclede input als percentage van totaalgewicht	%

### Herkomst materiaal duurzaam geproduceerd hernieuwbaar/ niet-duurzaam geproduceerd hernieuwbaar

<input type="checkbox"/> Aandeel hernieuwbare input als % van totaalgewicht	%
<input type="checkbox"/> Type hernieuwbare input	agrarische bijproducten, bamboe, hatoen, gras/stro, hennep, plantaardige olie, etc...
<input type="checkbox"/> Aandeel duurzaam geproduceerd* hernieuwbare input als % van totaalgewicht	%
<input type="checkbox"/> Aandeel niet-hernieuwbare input als % van totaalgewicht	%

### Geschatte levensduur (SBK-bepalingsmethode)

<input type="checkbox"/> Restlevensduur tot (+ bepalingsmethode)	dd/mm/jjjj + tekst
------------------------------------------------------------------	--------------------

### Toekomstscenario's

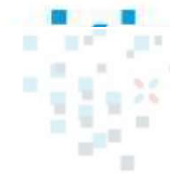
<input type="checkbox"/> Potentieel (meest hoogwaardig) hergebruik + toelichting hoe	Tekst
--------------------------------------------------------------------------------------	-------

\* duurzaam geproduceerd volgens criteria in paragraaf 4.3.2 van de Leidraad 'Kernmethode voor het meten van circulariteit in de bouw'

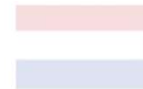
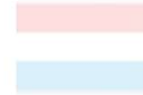


# Overview existing initiative

- Governments - Supporting circular economy
- Producer - Circular design and management of products
- Designers and engineering offices - Tools for product selection
- Building owners - Circular management of buildings



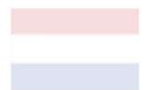
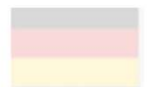
PCDS  
PRODUCT CIRCULARITY  
DATA SHEET  
LUXEMBOURG



+



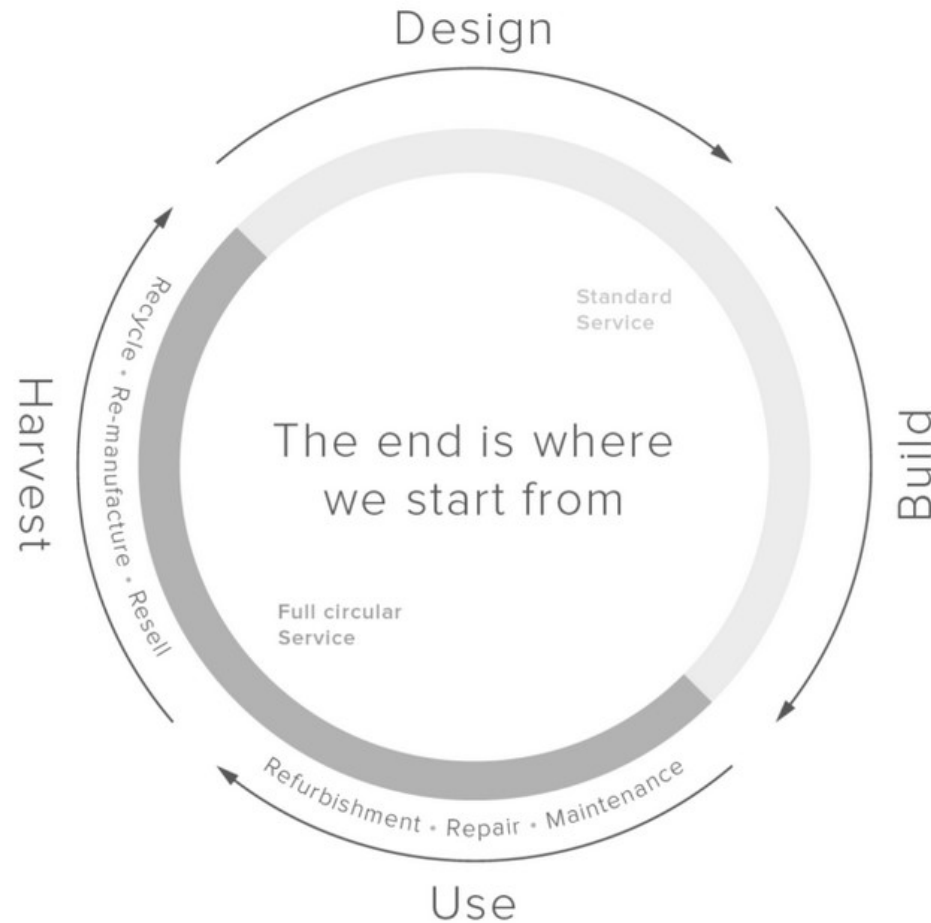
Building  
Material  
Scout







# Producers



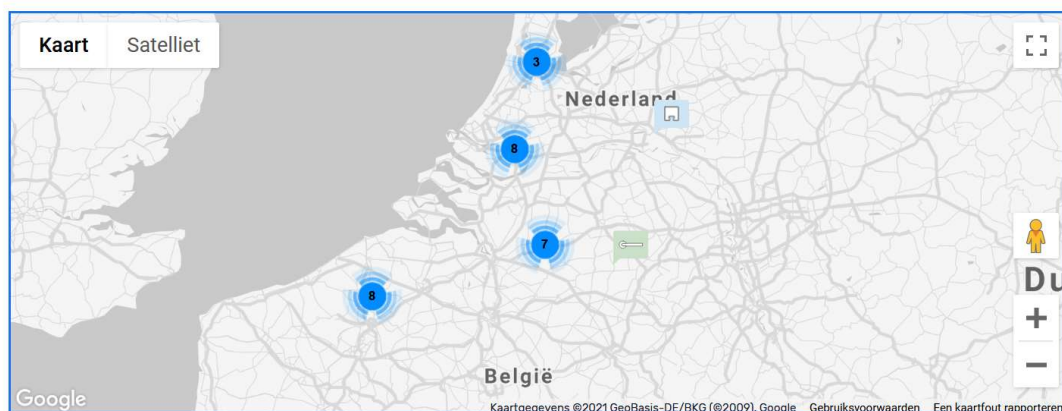
- Return on circularity investments
- Support new integrated business models
- Recovery of own products
- Offering a quality warantee
- Insight into existing stock and future availability




# Producers

**JANSEN**  
by ods

NIEUWS PRODUCTEN OVER ONS PROJECTEN SERVICES OFFERTES CONTACT  



 Deur  Raam  Profiel  JansenProfiel  Geveldeel  Overige



## DUBBELE BINNENDEUR

deur



Beschikbaar: 1

[Meer info](#)

## VAST RAAM ARTE

raam



Beschikbaar: 1

[Meer info](#)

## ECONOMY 60 RVS 316 PROFIELEN 01.684.02

Jansen-profiel



Beschikbaar: 20

## DRAAI KIP RAAM 2 JANISOL

raam



Beschikbaar: 1

<https://www.jansenbyods.com/oogstkaart/>



# Producers



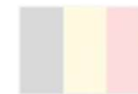
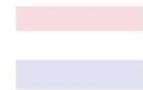
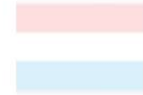


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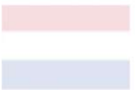
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- **Designers and engineering offices** - Tools for product selection
- Building owners - Circular management of buildings



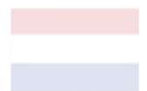
PCDS  
PRODUCT CIRCULARITY  
DATA SHEET  
LUXEMBOURG



+



Building  
Material  
Scout





# Designers and engineering offices



- **Supporting decision making on product choice:**

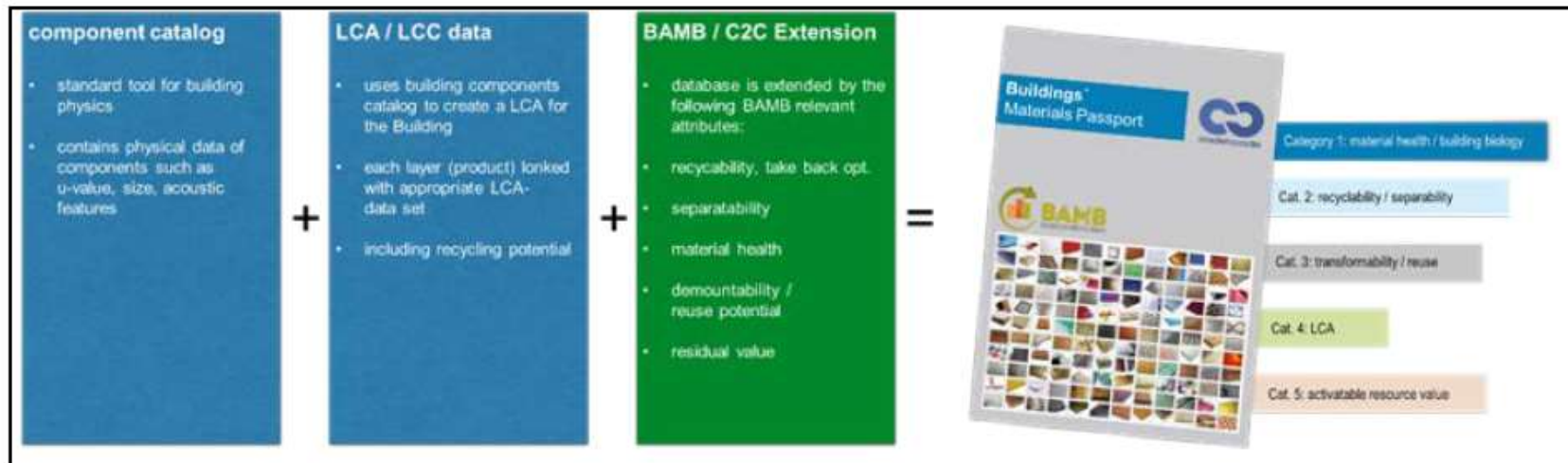
- Products sustainability and circularity data
- Technical characteristics of reused products to ensure compliance

- **Supporting decision making for refurbishment:**

- Understanding existing buildings' composition:  
simplified identification of preservation, reuse and recycling potential
- Renovation and demolition inventory:
  - > speed, convenience and accuracy ↑
  - > costs ↓



# Designers and engineering offices



*Buildings' Material Passport as a logical evolution of existing instruments, Drees & Sommer*

## The BAMB specific attributes

- Category 1: material health /building biology
- Category 2: recyclability / reparability
- Category 3: transformation / reuse potential
- Category 4: LCA including recycling potential
- Category 5: resource value potential





# Designers and engineering offices



[Our Services](#) [Green Building](#) [About us](#) [News](#) [FAQ](#) [go to platform](#)

3 4 . 9 8 4 Products

**Your Service Platform for Sustainable Building Products**

FIND | ASSESS | DOCUMENT Products

Search term / enter product ...

Search



# Designers and engineering offices

## Search engine

**Filter by:**

[Reset all filters](#)

**Ecolabels & Product-Assessments** ▾

- ☐ DGNB Navigator Label (3)
- ☐ AgBB tested (7)
- ☐ Austrian ecolabel (4)
- ☐ Blauer Engel (20) ▾
- ☐ Byggsvarubedömningen (BVB) (1)

[more](#)

**Building-Assessment** ▾

- ☐ BNB BN 2015 (128) ▾
- ☐ BREEAM International New Construction 2016 (184) ▾
- ☐ BAMB Circularity Passport 1.1 (20) ▾
- ☐ DGNB Gebäude Neubau 2018 (175) ▾
- ☐ DGNB NBV 2015 (270) ▾
- ☐ LEED Building Design and Construction V3 (2009) (374) ▾
- ☐ LEED Building Design and Construction V4 (2015) (239) ▾

**Product Type** ▾


- ☐ Adhesive (574) ▾

Search Keyword : (38625 Results [i](#))

Relevance


**KEIM Biosil**

KEIMFARBEN Ges.m.b.H.

 [i](#)


**Synthesa Caparol Sylitol Bio Innenfarbe**

Synthesa Chemie GesmbH

 [i](#)

**Baumit Sanova EinlagenTrassputz**

Baumit Wopfinger Baustoffindustrie GmbH

 [i](#)

**Brenner PLAN S1-25 N+F 23 LR**

Ziegelwerk Brenner EWirth Ges.m.b.H.



# Designers and engineering offices

## Product information

Description of the product and information on the various aspects of sustainability

Building-Assessment	Ecolabels & Product-Assessment	Properties	Components	BIM	Downloads	Contact
▼ LEED Building Design and Construction V3 (2009)					Download	
▼ BNB BN 2015					Download	
▼ DGNB NBV 2015					Download	
▼ BREEAM International New Construction 2016					Download	
▼ LEED Building Design and Construction V4 (2015)					Download	
▼ DGNB Gebäude Neubau 2018					Download	
▼ BAMB Circularity Passport 1.1					Download	
▼ WELL v1 with Q1 2019 addenda					Download	

### Emissions

Formaldehyde emissions:	0,007	mg/m <sup>3</sup>
R-Value according to AgBB	0,091	
Has the product been tested for indoor air emissions?	Yes	
TVOC after 3 days	0,1	mg/m <sup>3</sup>
TVOC after 7 days	0,0	mg/m <sup>3</sup>
TVOC after 14 days	0,0	mg/m <sup>3</sup>
TVOC after 28 days	0,0	mg/m <sup>3</sup>

### Life Cycle Assessment

Functional Use Period	40	a
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### Circularity

Has the product been designed for reuse, refurbishment or remanufacturing?	Yes
Is the product designed for a recycling of equal quality?	Yes
Was the product designed for biodegradation?	No
Was the product designed for clean incineration?	No
Product was designed with cycling in mind.	Yes
Was the Product designed for emission or direct dispersal?	No
Was the product specifically designed for clean and rapid disassembly?	Yes

### Ingredients

VOC Content	N/A	
VOC Content:	N/A	
Recycled content pre-consumer:	75	wt%
Recycled content post-consumer:	0	wt%
Percentage of the product's composition, that is known to the chemical ingredient level	100	wt%
To what level of detail is the product composition known?	100	ppm
Reused content	0	wt%
Rapidly renewable content	75	wt%
Non renewable virgin raw material content	25	wt%
SVHC according REACH < 0,1 %:	Yes	

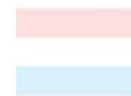


# Overview existing initiative

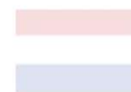
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PCDS  
PRODUCT CIRCULARITY  
DATA SHEET  
LUXEMBOURG



PLATFORM  
CB'23



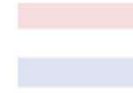
HARVEST  
BAY



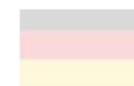
+



circling



Building  
Material  
Scout



MADASTER





## Building owners




- Defining circularity targets
- Integrated circularity analysis at building level
- Centralisation of data and better knowledge of the building
- Transparency and better knowledge of the building in the context of purchase/sale and rental/lease
- Transparent communication about energy performance, circularity performance, etc.
- Definition of the (material) value of the building








# Building owners





 Demomodel


 User 1


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 Region 1

 Portfolio 1

 Demomodel

 Administration

 Support

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## DEMOMODEL

GENERAL

DOSSIER

USERS

BUILDING

CIRCULARITY

FINANCIAL

APPS

EDIT BUILDING

MOVE BUILDING

DELETE

RECALCULATE BUILDING

PUBLISH MATERIAL PASSPORT

UPLOAD

ENRICH

**ADDRESS**

Newtonlaan 115  
3584BH Utrecht

**MADASTER INFORMATION**

Classification method:

NL-SfB

Material Classification:

NL-SfB label 3:

Building usage:

Offices (Office < 1000m2)

Most recent BIM information:

09-06-2020 13:01

Gross Surface Area:

2000 m<sup>2</sup>

Building phase:

New building


Delivery date:

01-06-2020

Last renovation date:

-

**OPEN STREET MAP**

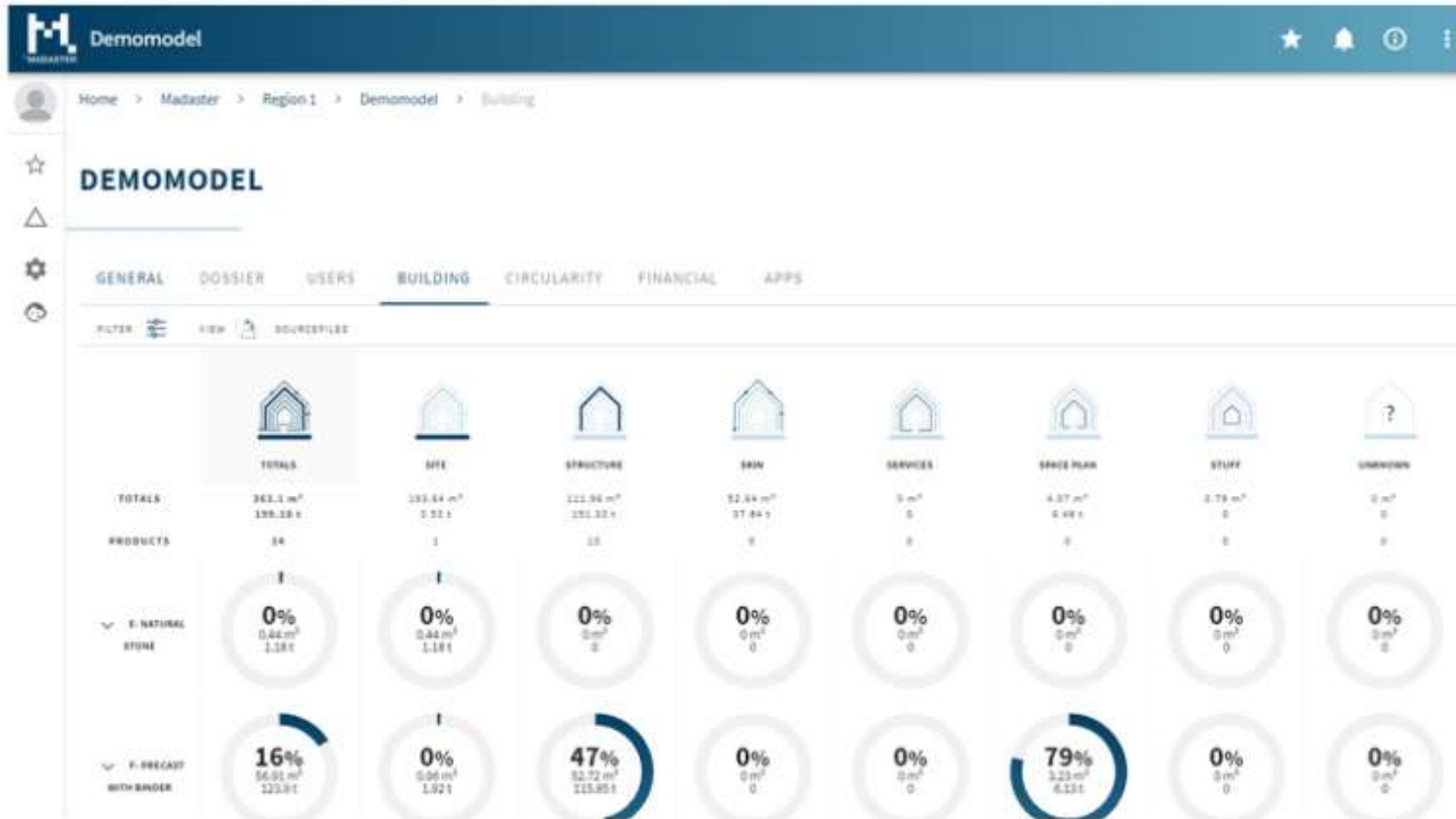


<https://madaster.nl/>



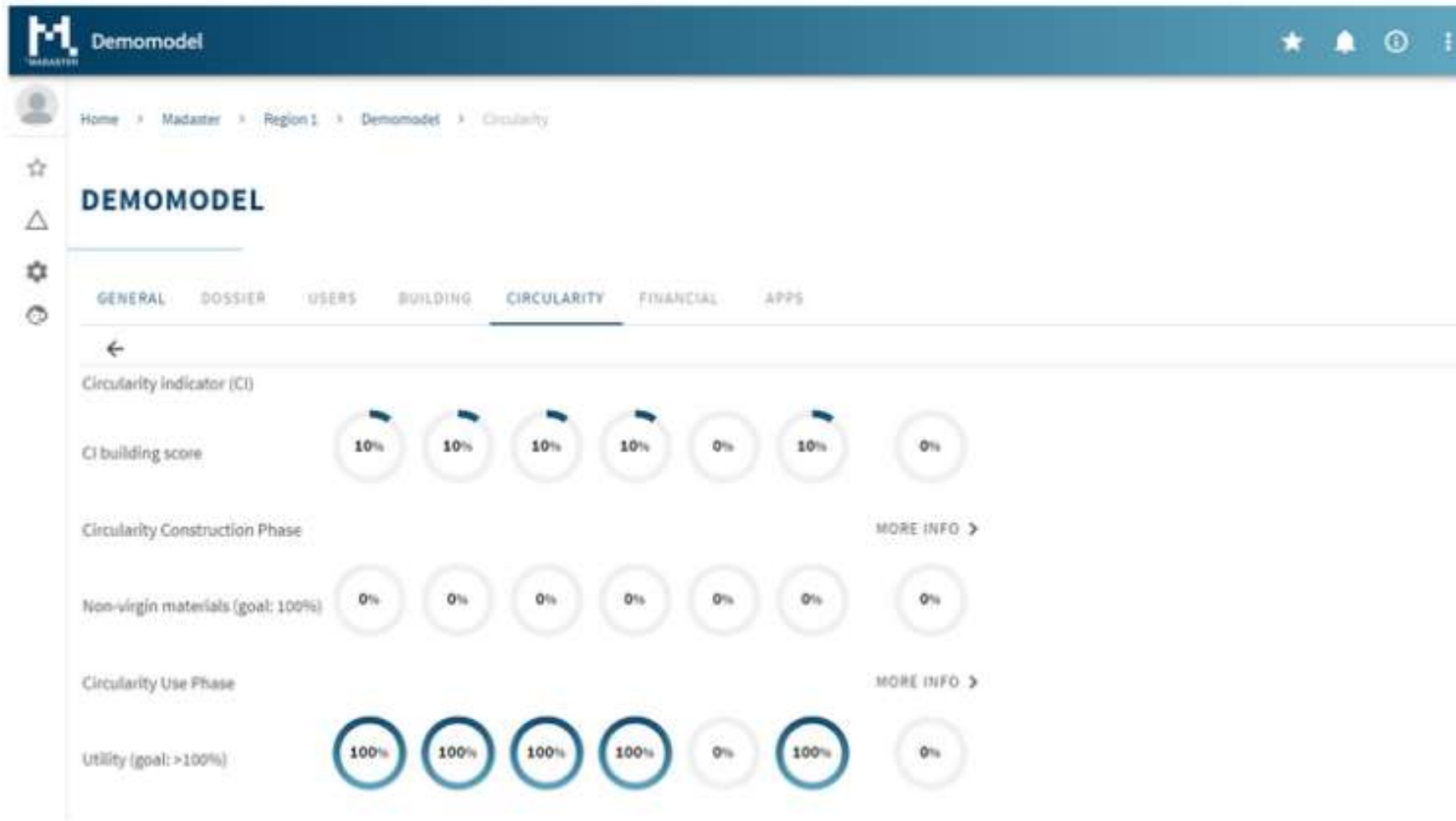


# Building owners



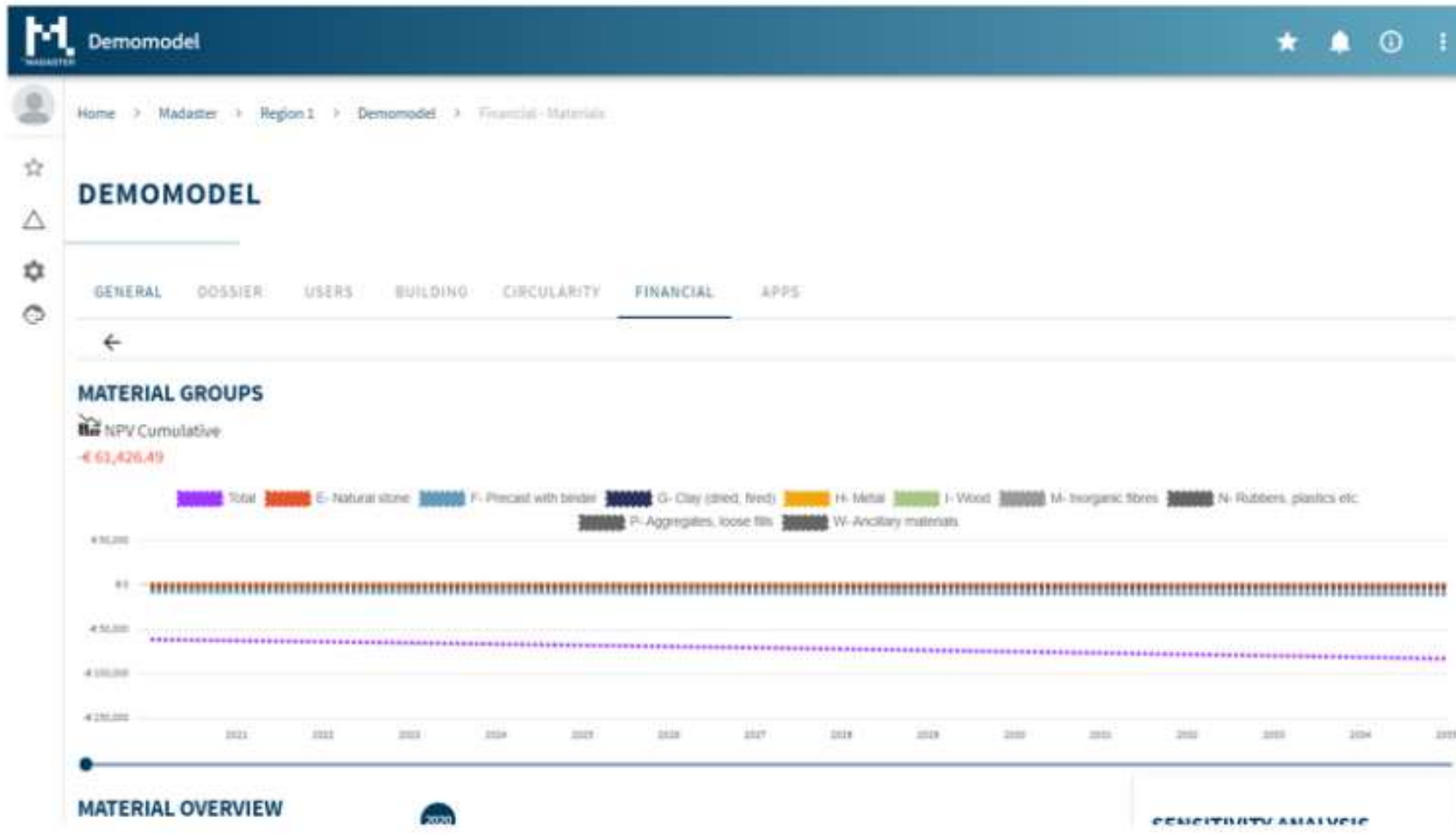


# Building owners





# Building owners





# What happens at the EU level?

- **Product level:**
  - 'Sustainable product approach' developed in the new Circular Economy Action Plan
  - Sustainable Product Policy Initiative (revision of the Eco-design directive)
  - EU strategy for Data
    - ⇒ EU Digital Product Passport
- **Building level:**
  - Digital Building Logbook

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