REVERSIBLE EXPERIENCE MODULES

EPEA Nederland

EXPERIENCING CIRCULARITY: TANGIBLE AND VISUAL ELEMENTS

Circularity can be an abstract concept which seems disconnected from the drawing table, far from today's reality. The REMs exhibition brings circularity for you to directly experience.

The exhibition showcases 70 products optimized for reversible architecture.

Visitors can feel and use the materials and products, understand the range of options available, and interact with the materials passport platform.

Each product is represented by:

- NFC chips and physical business cards to take home with the product name, producer, and a QR code linking to the digital passport, like the NFC chip.

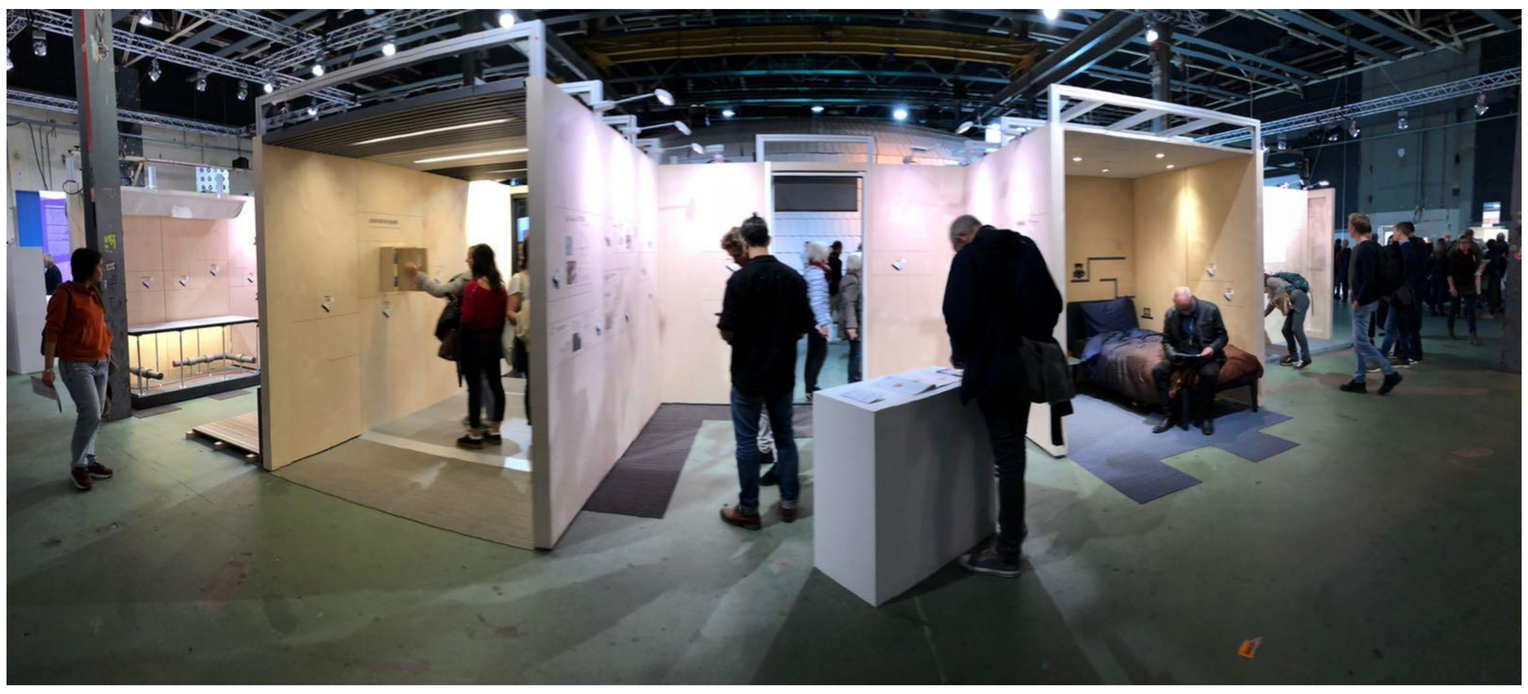
- A digital passport in the BAMB prototype ICT platform

- A page in the manual guide with a visual summary of the passport, including the reuse potentials diagram

Two overarching video clips were developed to support the storyline of the rems

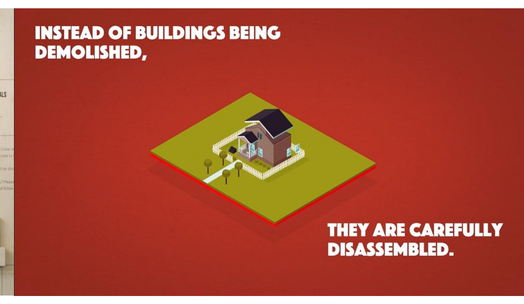
- One introducing the REMs as a travelling exhibition, and its main features

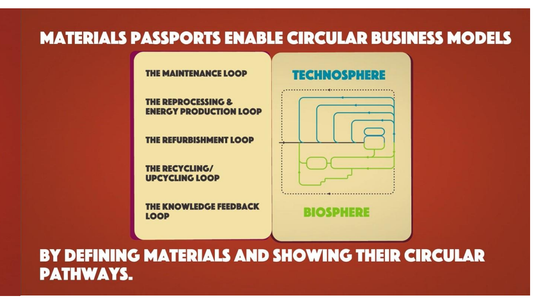
- One elaborating on the BAMB concepts and the reuse potentials diagram

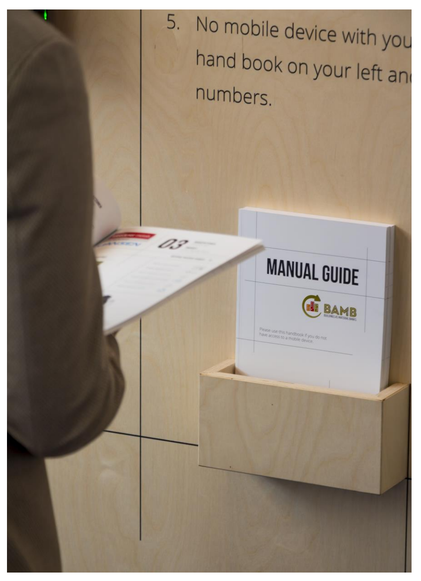


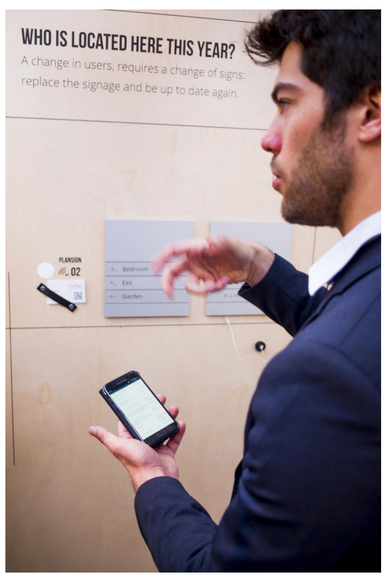
Experience circularity directly

The REMs are an environment where circularity can first be seen and touched, and then discussed.









Understand circularity and passports through interaction

With visual summaries, digital passports on mobile devices, physical interactions with products, and conversations with hosts, visitors gain an understanding of the possibilities of reversible architecture and material passports.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 642384.

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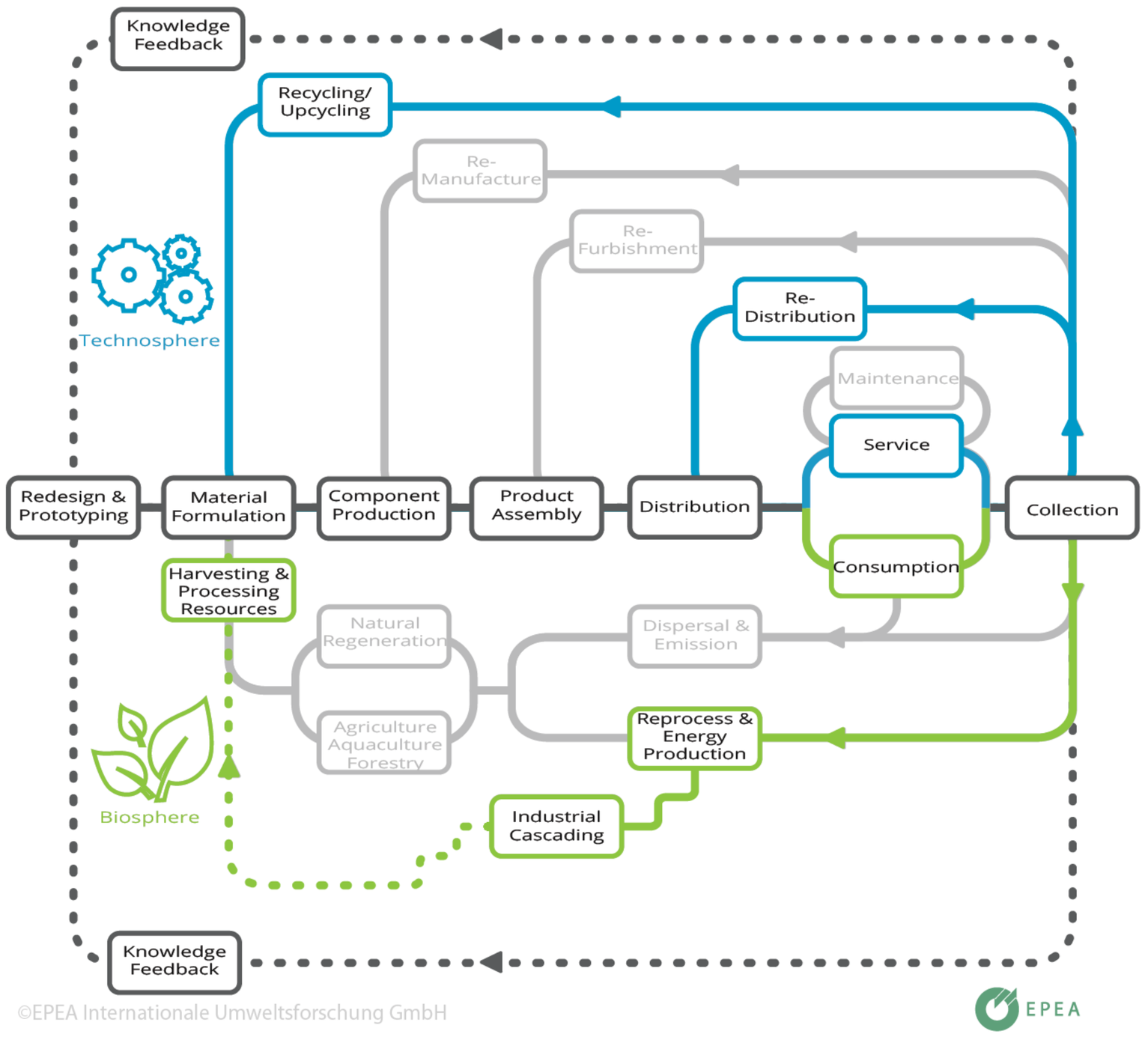
THE REUSE POTENTIALS DIAGRAM

The reuse potentials diagram shows which possible routes materials, components and products can take after first use. Based on the cradle-to-cradle principles, the diagram shows so-called "nutrient pathways' both in the bio- and technosphere. Based on a combination of construction, material properties and expected use scenario, the diagram shows which of the pathways are possible. This way it serves as an analysis and communication tool.

Furthermore, the diagram clearly shows which pathways are yet to be activated and may be considered: the diagram is an innovation tool to discover optimization goals to increase the circularity potential of products and materials.

The diagram is based on information present in the material passports and is included in their visual summary or "dashboard".

The example diagram shown here applies to Everuse Insulation material made from recycled cellulose fibers. It is verified that the material is recyclable in the technosphere, and suitable for energy production in the biosphere. It is intended but not yet verified to be suitable for industrial cascading in the biosphere.



MAINTENANCE – product is designed so that it can be maintained, preserving its function, and extending its use phase.

RE-DISTRIBUTION – product is designed so that it can be re-allocated without or with minimal modifications and continue to be used at its new location, extending its use phase.

RE-FURBISHMENT – product is designed such that components can be replaced or upgraded to retain or increase product performance and extend the product's use phase. a product may have to be removed from its location or context in order to refurbish it.

RE-MANUFACTURE – product is designed so that when it reaches its end-of-use-phase, components can be reused directly in the production of new products, extending the components' use phase.

RECYCLING/UPCYCLING – product is designed so that the components and materials can be separated and mechanically or chemically recycled into new raw materials with similar or improved quality. a viable recycling/upcycling pathway is the minimum requirement for a product to be recognized as "designed for the technosphere."

DISPERSAL & EMISSION – product is designed to be directly or indirectly dispersed or emitted into the biosphere.

REPROCESS & ENERGY PRODUCTION – product is designed to be reprocessed mechanically, chemically, or thermally to create feedstocks for further industrial cascading, or return to the biosphere. this step may include industrial composting or digesting.

INDUSTRIAL CASCADING – product is designed for technical reprocessing to create new products with loss of material. wood and paper is recycled in industrial cascades: cellulose fibers cannot be recycled endlessly, and eventually flow back into the biosphere, directly or indirectly.

NATURAL REGENERATION – product is designed so that it can be reused as a nutrient in natural biological cycles, directly or after reprocessing, creating new resources in the process.

AGRICULTURE, AQUACULTURE, FORESTRY – product is designed so that it can be reused as a nutrient in controlled biological cycles, like compost in agriculture.

HARVESTING & PROCESSING RESOURCES – product is designed so that it can eventually be extracted from the biosphere for the formulation of new materials. when harvesting & processing is a viable option, a product is truly designed for the biosphere.

KNOWLEDGE FEEDBACK – based on knowledge obtained during production, use, and end-of-use processing, products are redesigned and optimized to increase their reuse potential.

- Technological Pathway - 3rd party verified
- Biological Pathway - 3rd party verified
- Technological Pathway - Intended
- Biological Pathway - Intended
- Pathway always applicable
- Pathway not applicable
- Knowledge feedback loop e.g. through materials passport

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BAMB BUILDINGS AS MATERIAL BANKS

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REVERSIBLE VS. RELIABLE? ENGAGING THE BUILD TEAM

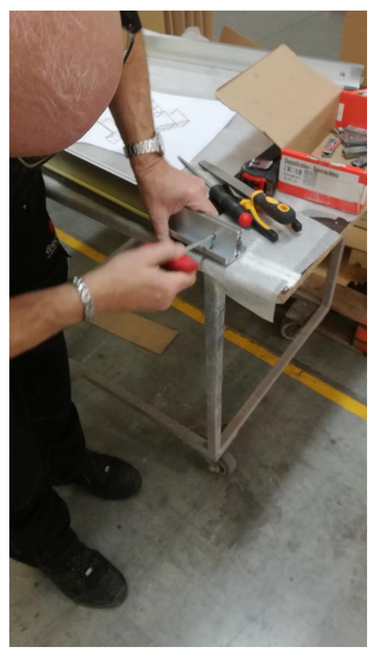
Not all builders support the complexity of constructing reversibly. Their perception can be that novel reversible construction principles are less reliable than the permanent connections they are familiar with. They can be hesitant to provide assurance of quality. Or they manage the perceived risks by drastically increasing costs for constructing reversibly. If they are willing to engage with a reversible project at all.

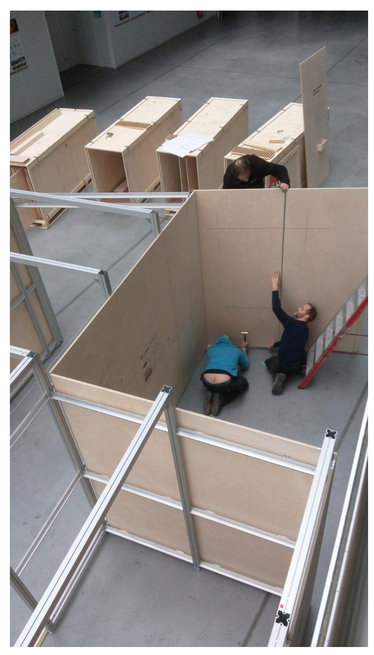
The selection of partners with a similar appreciation of the added value of reversible architecture at the start of a project is crucial. All members of the design and build team should be motivated to explore novel solutions that still have to be proven.

Because of the novelty of construction, testing through mockups and prototyping is of extra importance. Studio &Lotte emphasized this in her process to increase the builders engagement.

For the REMs the selected build team of Gielissen had the chance to learn at each of the six installments. The knowledge they generated was fed back into the development of improved versions of the REMs. Each version was digitally tested in a cad model, and when needed a proof of concept was built on site.

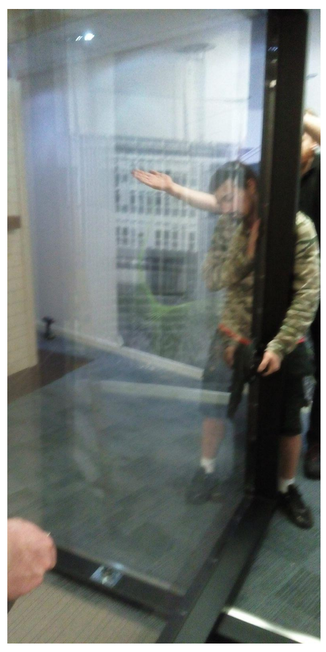
Reversibility allows design and build teams to have shorter feedback and learning loops, increasing the speed of improvement.

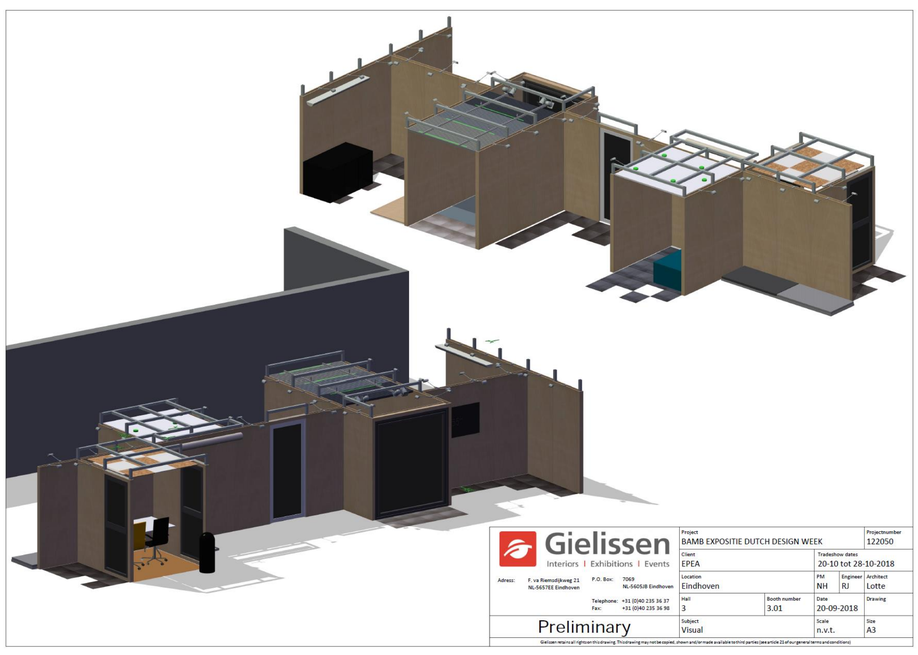




Shared challenge

The REMs build team from Gielissen, took up the challenge to make something novel.





Feedback loop from building to designing

The knowledge generated at each build was fed back into the redesign and continuous improvement of the REMs. The distinction between builders and designers disappears.

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