Now

CIRCULOOS

Wood Pilot

Remanufacturing wood for sustainable construction

Wood Pilot



THE NETHERLANDS

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Funded by the European Union

This project has received funding from the European Union's "Horizon Europe" programme under grant agreement 101092295



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Results: Impact

Impact	KPI	Result	Benchmark
Environmental	CO_2 saving vs. virgin CLT	≈ 50%	≥ 25%
	CO_2 saved by using local wood	3.02	N/A
Economic	Cost Reduction	47.20%	30%
	Energy saving	15-25% (avg. scrap rate)	10%



The Waiting Room Pavilion

Local and circular material use

inter matter

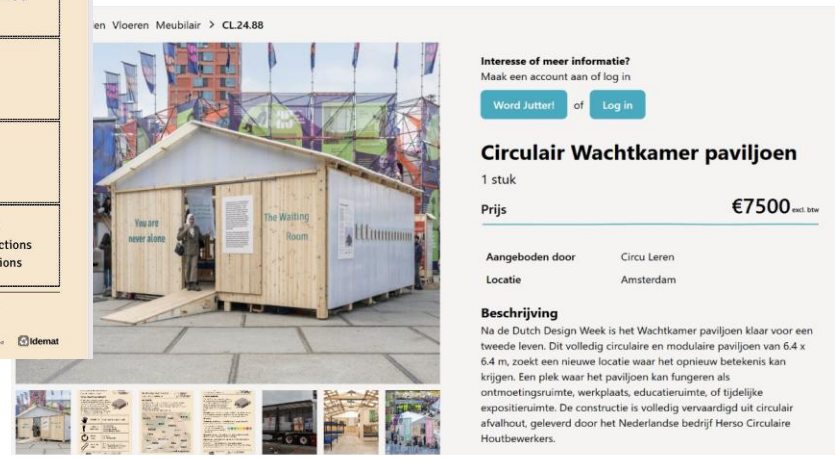
TOTAL MATERIAL IMPACT

For this project, the architects aimed to maximize the use of local and reclaimed materials. The design was developed before the available materials were fully identified, this led to higher material loss during production. In collaboration with suppliers and makers, the project achieved the highest feasible level of circularity. We are in contact with partners to explore reusing the pavilion as it is.

HANDPRINT	Total use of 168 pair of hands
FOOTPRINT 100% NEW	Total **CO2**: 2401 **kg** Total **CO2** new: **6197 kg** Total **eco-costs**: **563 euro** Total **eco-costs** new: **1760 euro**
REUSE INDEX	95 % **Reuse** 5 % **New materiales**
CIRCULAR INDEX	0.5 % **permanent** connections 99.5 % **semi-permanent** connections 0 % **not permanent** connections

Visit us:

Made possible by: inter matter, De Wachtkamer, CIRCU LEREN, TBI Klimaattrein, Idemat



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Results: Achievements

High level goals:

- ✓ Minimize use of virgin wood, maximize used wood
- ✓ Extend the business model of 'Wood As A Service' (WAAS)
- ✓ Optimize traceability in the supply chain and the production process (DPP)
- ✓ Minimize ad-hoc communication and connect LCA matrix in the design process
- ✓ Create digital twin to optimize production flow (HERSO 2.0)
- ✓ Certification for circularity
- ✓ Knowledge sharing within ecosystem

R strategies:

Smarter product use and manufacture	**R0**	**Refuse**	Make product redundant by abandoning its function or by offering the same function with a radically different product
	R1	**Rethink** ✓	Make product use more intensive (e.g. through sharing products or by putting multi-functional products on market).
	R2	**Reduce** ✓	Increase efficiency in product manufacture or use by consuming fewer natural resources
Extend lifespan of product and its parts	**R3**	**Reuse** ✓	Re-use by another consumer of discarded product which is still in good condition and fulfils its original function
	R4	**Repair** ✓	Repair and maintenance of defective product so it can be used with its original function
	R5	**Refurbish** ✓	Restore an old product and bring it up to date
	R6	**Remanufac** ✓	Use parts of discarded product in a new product with the same function
	R7	**Repurpose** ✓	Use discarded products or its part in a new product with a different function
Useful application of materials	**R8**	**Recycle** ✓	Process materials to obtain the same (high grade) or lower (low grade) quality
	R9	**Recovery**	Incineration of material with energy recovery

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eWoodX

Wood Pilot x IAAC

Next chapter:

Further optimalisation!

Together with IAAC (based in Barcelona)





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eWoodX

How can we use
digital tools and ***robotics***

to

turn different types and sizes
of ***waste wood***

into

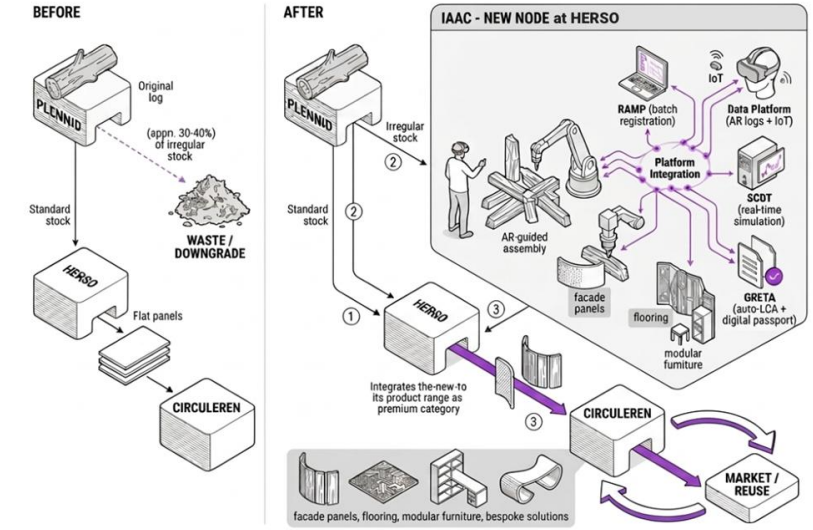
high-value ***products?***

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eWoodX - The Workflow



CHAIN-LEVEL IMPACT (KPIs)

Material & Efficiency
- Increased usable reclaimed timber (**+30-40%**).
- High reclaimed content in IAAC components (**>70%**).
- Reduced offcuts via geometry-driven CAM (**-30%**).

Sustainability
- Significant CO_2 reduction versus CLT benchmark (**30-50%** - verified via GRETA).

Commercial & Product
- Multiple new product typologies for Circuleren (**3+**).
- Margin uplift for HERSO (**15%**).

Traceability & Social Value
- Full material traceability via RAMP + digital passport.
- Upskilling of workers in AR/robotic workflows (Industry 5.0) (4 workers).

Iaac

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eWoodX -Impact

> 70%	30-50%	30%	15%	2+
Reclaimed content per component	CO2 reduction vs. CLT	Offcut reduction	Margin uplift for HERSO	EU replication candidates by M6

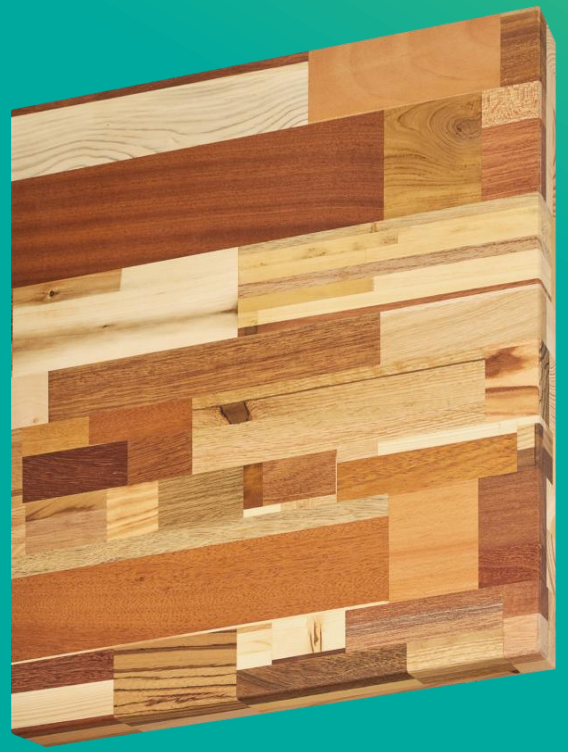
A1	A2	A3	A4
Chain Characterization	Workflow Deployment & Platform integration	Physical Demonstrator	Impact Assessment & Replicability
M1	M1- M4	M4- M5	M5-M6

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CHALLENGES



1 Using **irregular** and **lower-quality wood** in high-value **applications.**

2 Linking **material supply**, **production** and **demand** across the **full chain**.

3 Using data to **trace** materials, measure **impact** and improve **circular** performance.

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