



the Circular Retrofit Lab

a pilot project for circular construction

CIRCULAR
RETROFIT
LAB



Circular Retrofit Lab

the result of more than fifteen years of research on design for change



The research team working on 'Transformable structures for sustainable development'
(© VUB Architectural Engineering)

Circular Retrofit Lab

renovation of the Willy Van Der Meeren student houses



The Willy Van Der Meeren student houses on the VUB campus in Etterbeek, anno 2018
(© VUB Architectural Engineering)



The Willy Van Der Meeren student houses on the VUB campus in Etterbeek, anno 1990
(© Hilde Braet, Centre for Academic and Secular Archives (CAVA), VUB, Brussels)

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renovation of the Willy Van Der Meeren student houses



Relocation of one of the Variel modules, 2017 (© VUB Architectural Engineering)



Installation of the Variel modules, 1973 (© Archive Technical Service, VUB)

Circular Retrofit Lab

renovation of the Willy Van Der Meeren student houses



CRL site – original situation (© VUB Architectural Engineering)



Partial demolition, stripping of eight modules (© VUB Architectural Engineering)

Circular Retrofit Lab

high ambitions towards design for change



Circular Retrofit Lab

high ambitions towards design for change

versatile plan lay-out

adaptable & upgradable

demountable and reusable building kits

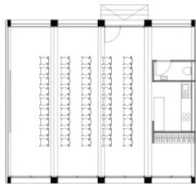
industrial partnerships

LCA / LCC

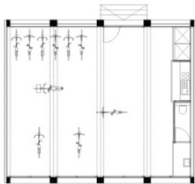


Circular Retrofit Lab

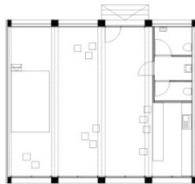
design for change through scenarios



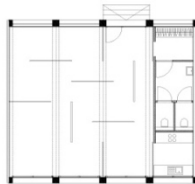
Dissemination Space



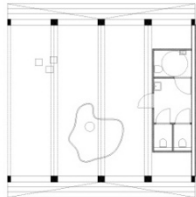
Bicycle Repair Shop



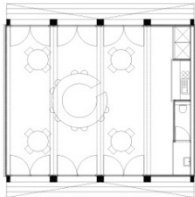
Concert Space



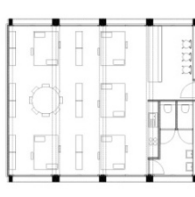
Exhibition Space



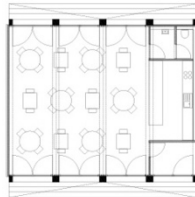
Multifunctional Open Air Space



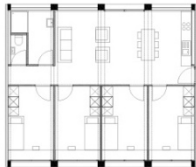
Information Office



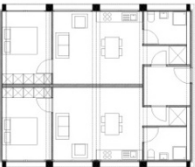
Plug-In Offices



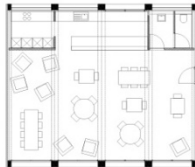
Bistro / Resto



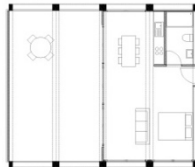
Updated Student Housing



Eco Guesthouse

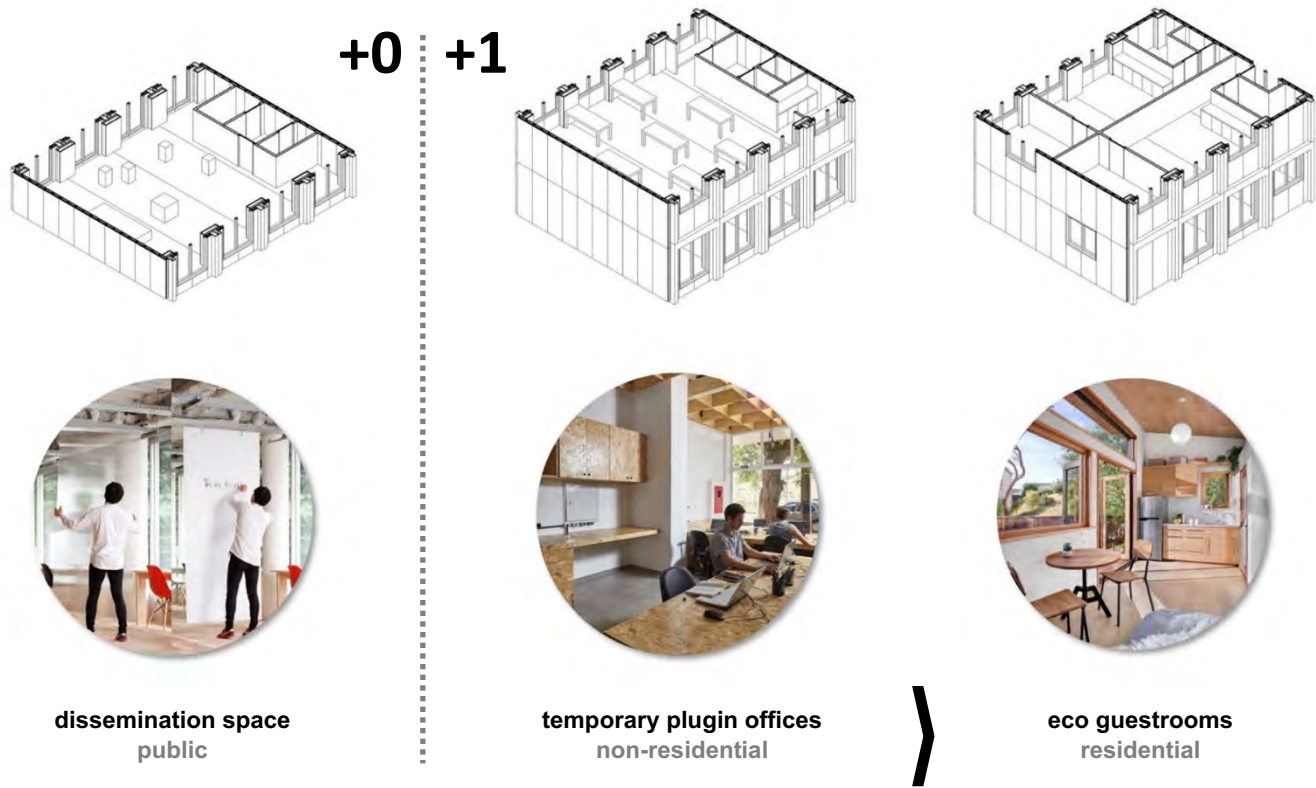


Sandwich Bar / Coffee shop



'Kavelkamer'

Circular retrofit Lab
design for change through scenarios



Circular retrofit Lab
a collaborative project

project coordination



architecture and engineering



internal solutions



façade solutions



services



Circular Retrofit Lab
a collaborative project



 **GEBERIT**



 **Gyproc**
SAINT-GOBAIN



 **ISOVER**
SAINT-GOBAIN



 **SYSTIMBER**



 **wall-linQ**



 **JuuNoo**
wall system

Circular Retrofit Lab

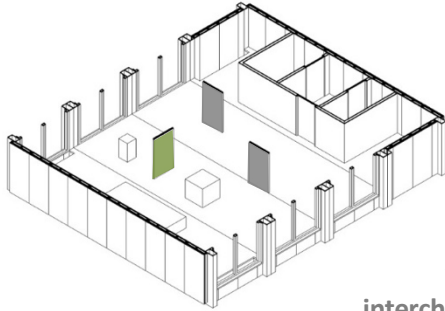
experimentation & collaboration



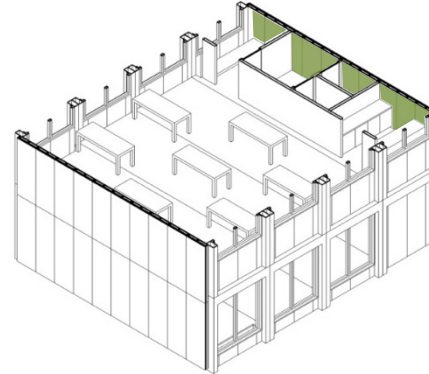
Different workshops to test the internal wall systems in the experimentation lab (© VUB Architectural Engineering)

Circular Retrofit Lab

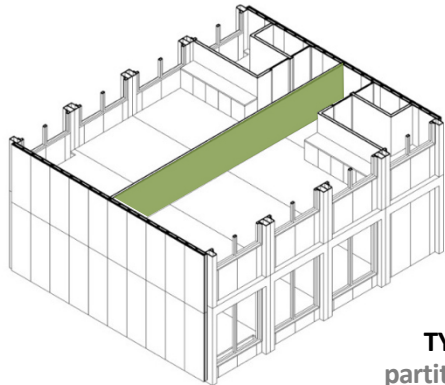
different systems are fit for different types of walls



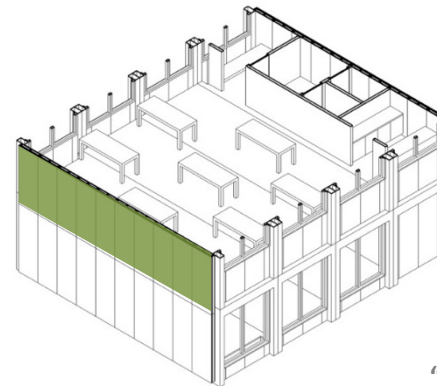
TYPE 1
interchangeable wall



TYPE 2
technical wall



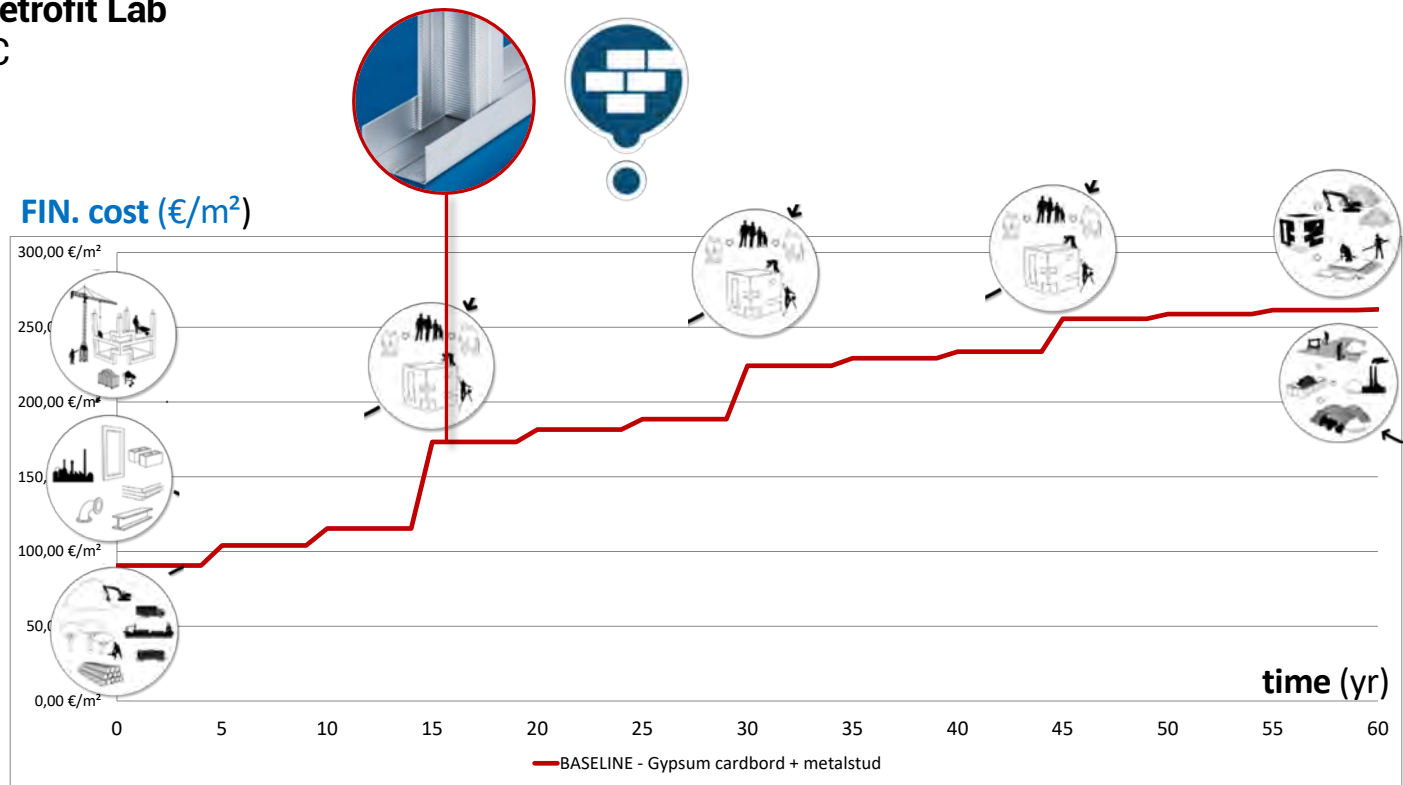
TYPE 3
partition wall



TYPE 4
“static” wall

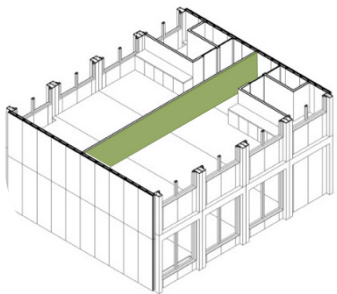
Circular Retrofit Lab

LCA & LCC



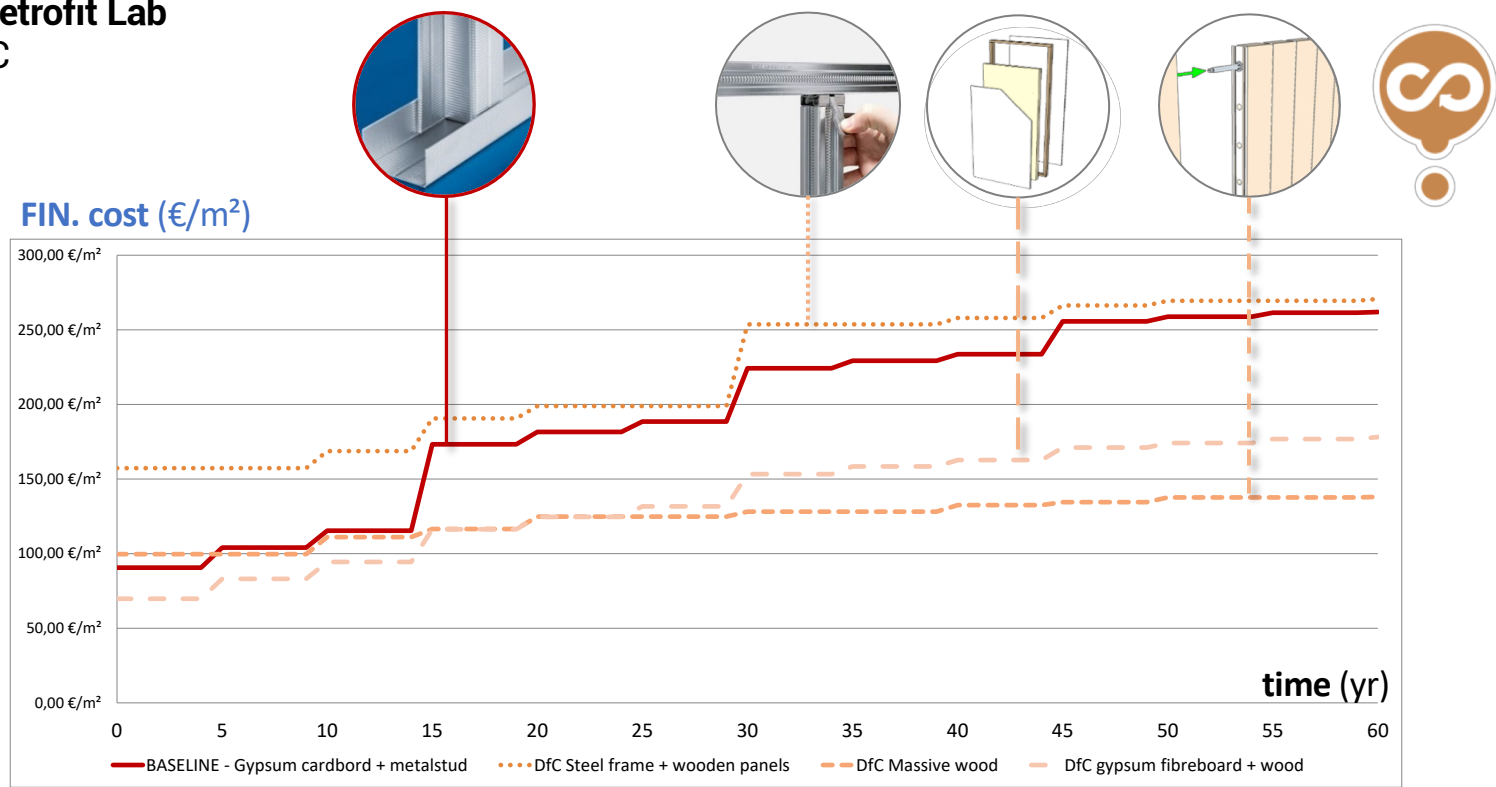
Analysis by VITO

partition wall



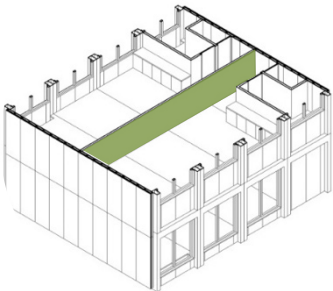
Circular Retrofit Lab

LCA & LCC



Analysis by VITO

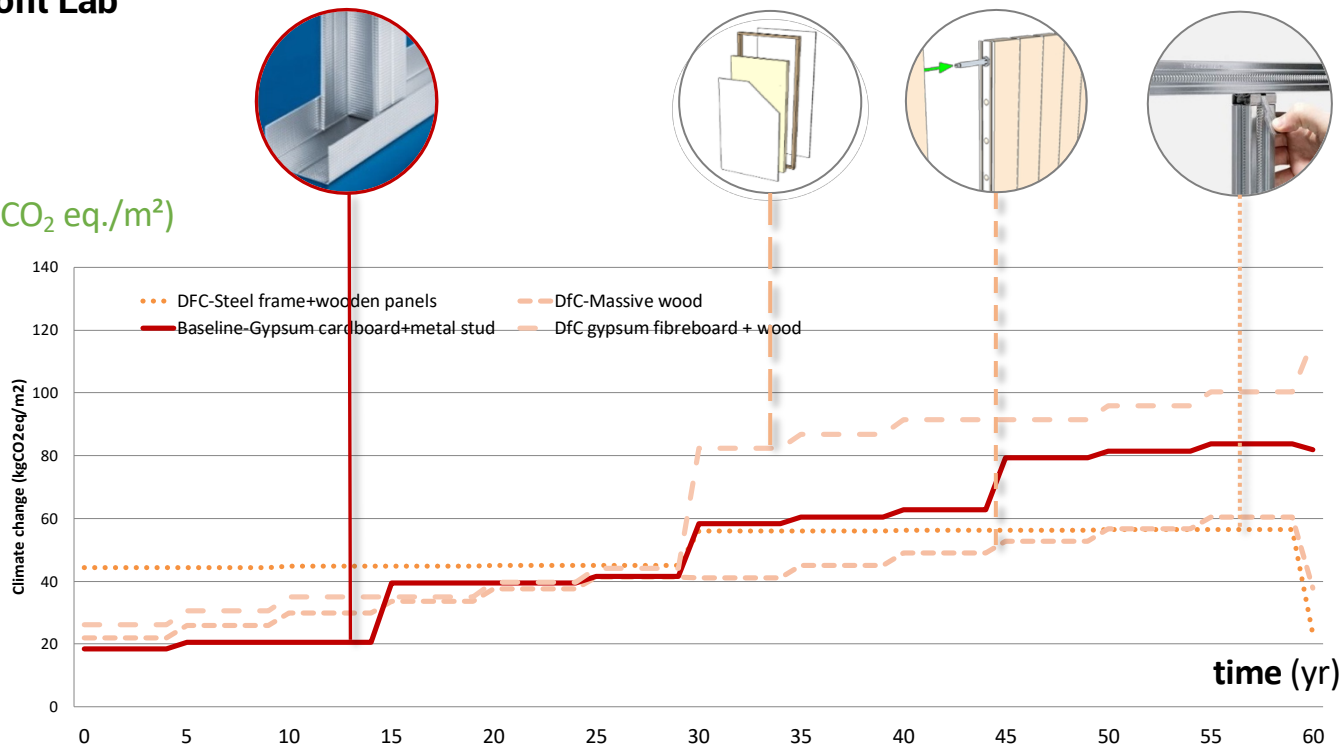
partition wall



Circular Retrofit Lab

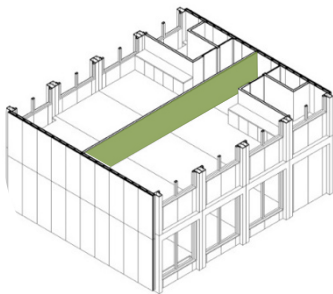
LCA & LCC

GWP (kg CO₂ eq./m²)



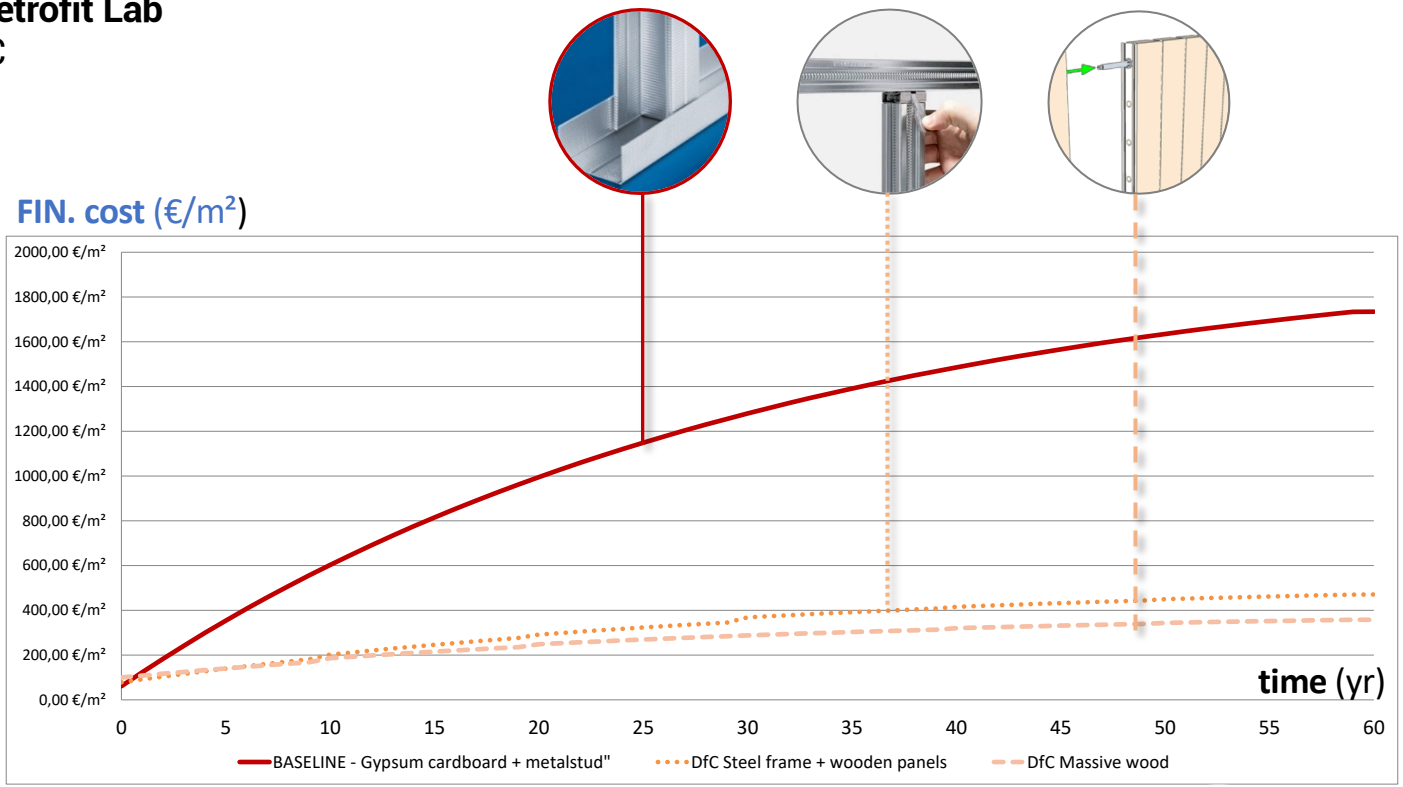
Analysis by VITO

partition wall



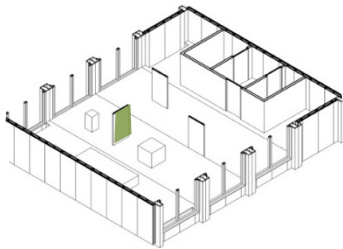
Circular Retrofit Lab

LCA & LCC



Analysis by VITO

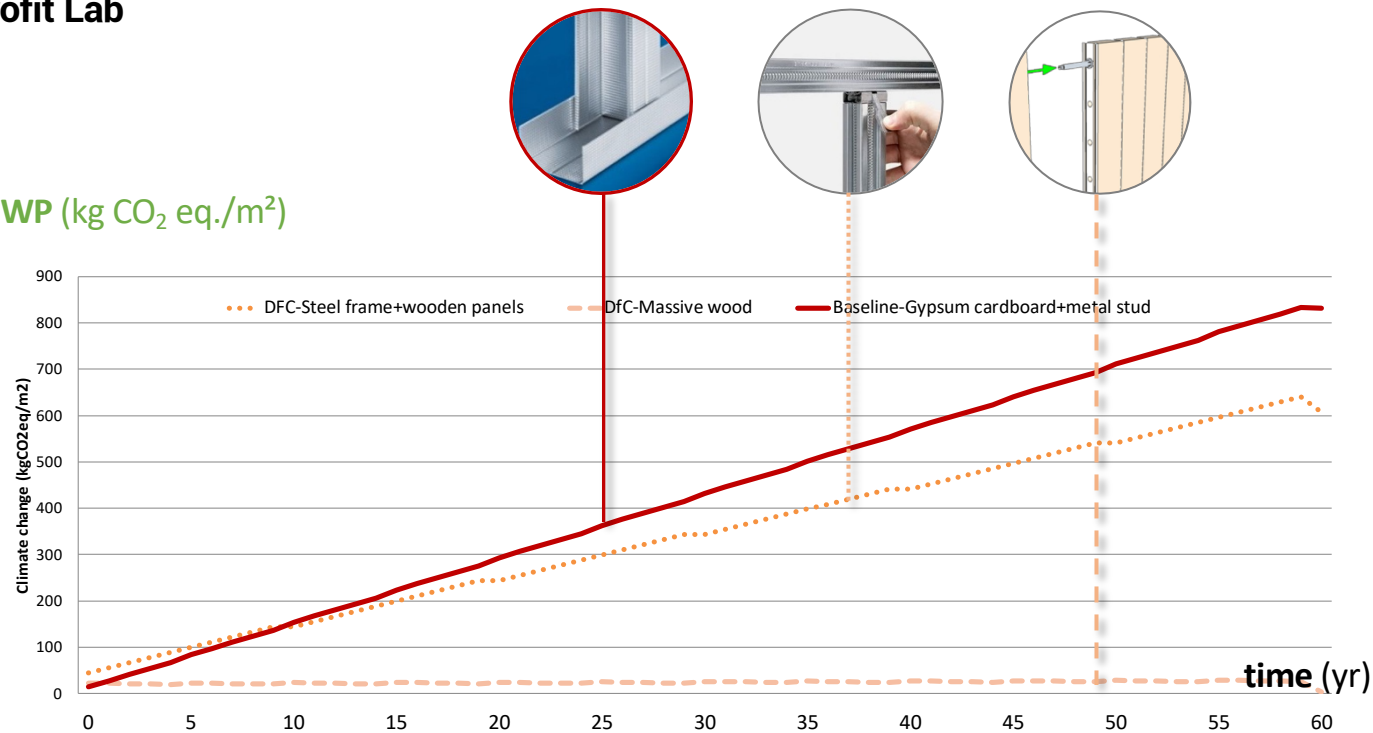
flexible wall



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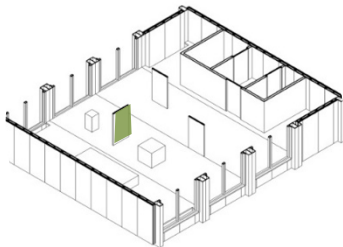
LCA & LCC

GWP (kg CO₂ eq./m²)



Analysis by VITO

flexible wall



Circular Retrofit Lab construction process



CRL site – original situation (© VUB Architectural Engineering)



Partial demolition, stripping of eight modules (© VUB Architectural Engineering)

Circular Retrofit Lab construction process



CRL site – original situation (© VUB Architectural Engineering)



Partial demolition, stripping of eight modules (© VUB Architectural Engineering)

Circular Retrofit Lab construction process



CRL site – original situation (© VUB Architectural Engineering)



Stripped and sanded structure (© VUB Architectural Engineering)

Circular Retrofit Lab construction process



Connections for the façades (© VUB Architectural Engineering)



Construction of curtain wall (© VUB Architectural Engineering)

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Prefabricated façade elements (© VUB Architectural Engineering)



Prefabricated façade elements with window frames (© VUB Architectural Engineering)

Circular Retrofit Lab

construction process



Installation of the façade elements (© VUB Architectural Engineering)



Installation of the façade elements (© VUB Architectural Engineering)

Circular Retrofit Lab

construction process



Installation of the façade elements (© VUB Architectural Engineering)



Installation of the façade elements (© VUB Architectural Engineering)

Circular Retrofit Lab

construction process



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Circular Retrofit Lab construction process



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Installation of the façade elements (© VUB Architectural Engineering)

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Installation of the façade elements (© VUB Architectural Engineering)



Installation of the façade elements (© VUB Architectural Engineering)

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Waterproofing of the envelope (© VUB Architectural Engineering)



Connections of the façade elements (© VUB Architectural Engineering)

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Insulation of cavities to ensure performance of envelope (© VUB Architectural Engineering)



Air-tightening (© VUB Architectural Engineering)

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Demountable services (© VUB Architectural Engineering)



Services integrated behind removable plinth (© VUB Architectural Engineering)

Circular Retrofit Lab

construction process



Installed façade elements (© VUB Architectural Engineering)



Installation of the cladding (© VUB Architectural Engineering)

Circular Retrofit Lab construction process



Installed façade elements (© VUB Architectural Engineering)



Installation of the cladding (© VUB Architectural Engineering)



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