



Results Housing for Zero Energy

Ivar Diekerhof – Supervisor H4.0E WikiHouse pilot Almere

23 mei 2022

- Propels innovation in housing and living
 - By doing experiments in Almere and the Floriade
 - Own initiative or in a joint partnership
 - Scale up when successful
-
- Partnership with H4.0E partners
 - Results H4.0E project

Gemeente Almere



Ministerie van Binnenlandse Zaken en
Koninkrijksrelaties

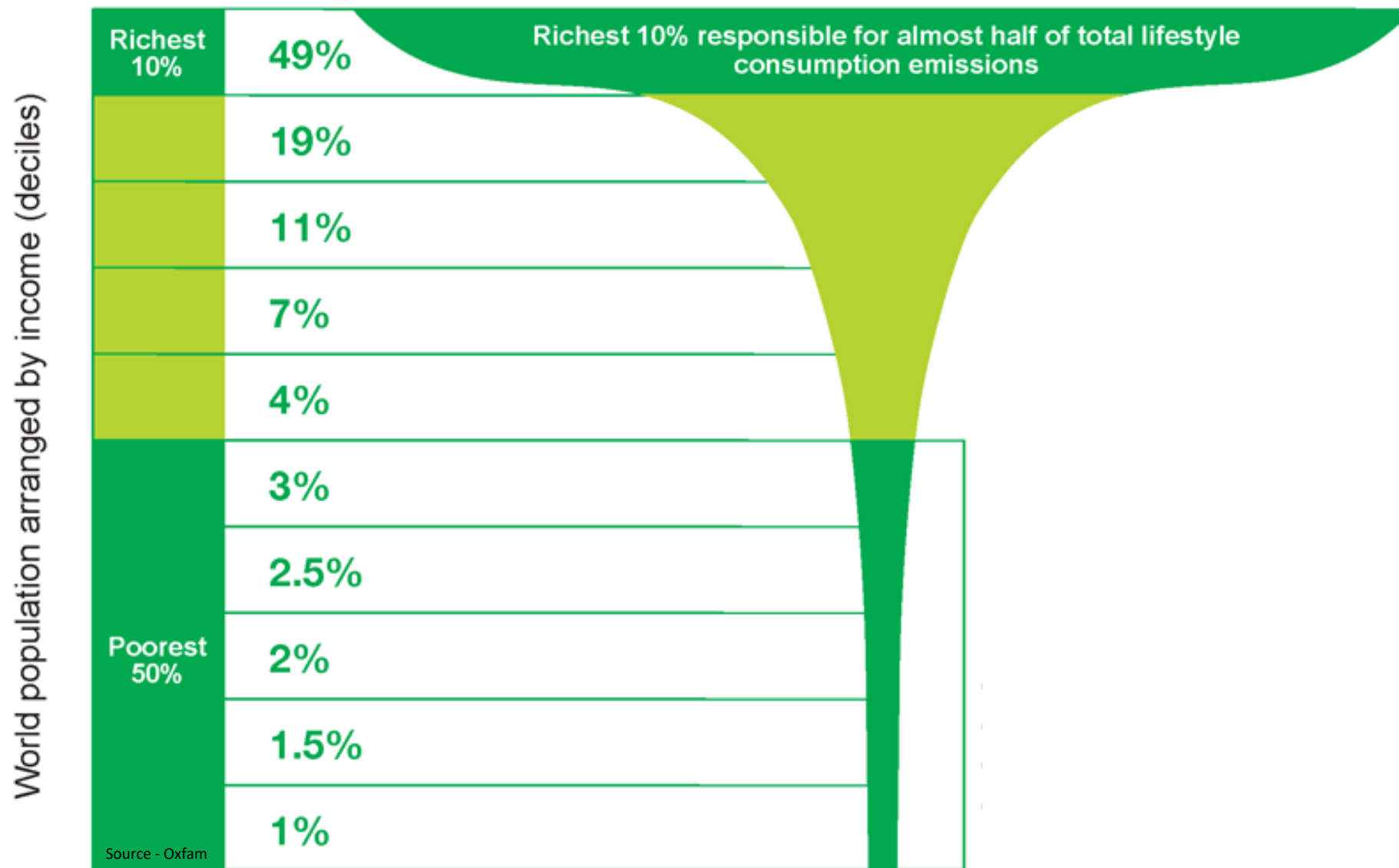


Rijksvastgoedbedrijf
*Ministerie van Binnenlandse Zaken en
Koninkrijksrelaties*

atelier RIJKSBOUWMEESTER



Percentage of CO₂ emissions by world population





39%

The % of carbon emissions the building and construction industry are responsible for

Made up of:



28%

Operational efficiencies
(energy needed to heat/power a building)



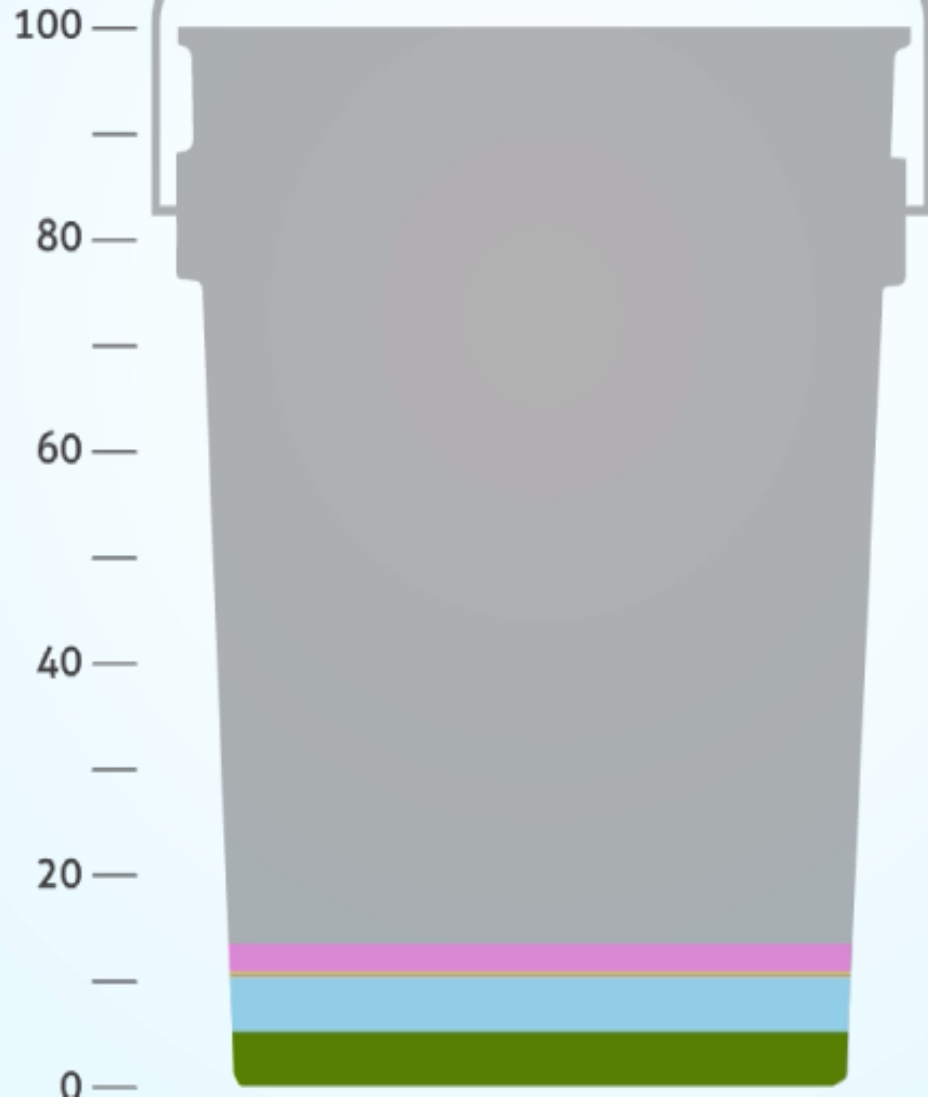
Materials & construction



Carbon budget for 1.5 degrees

Source – Stanford University

1950

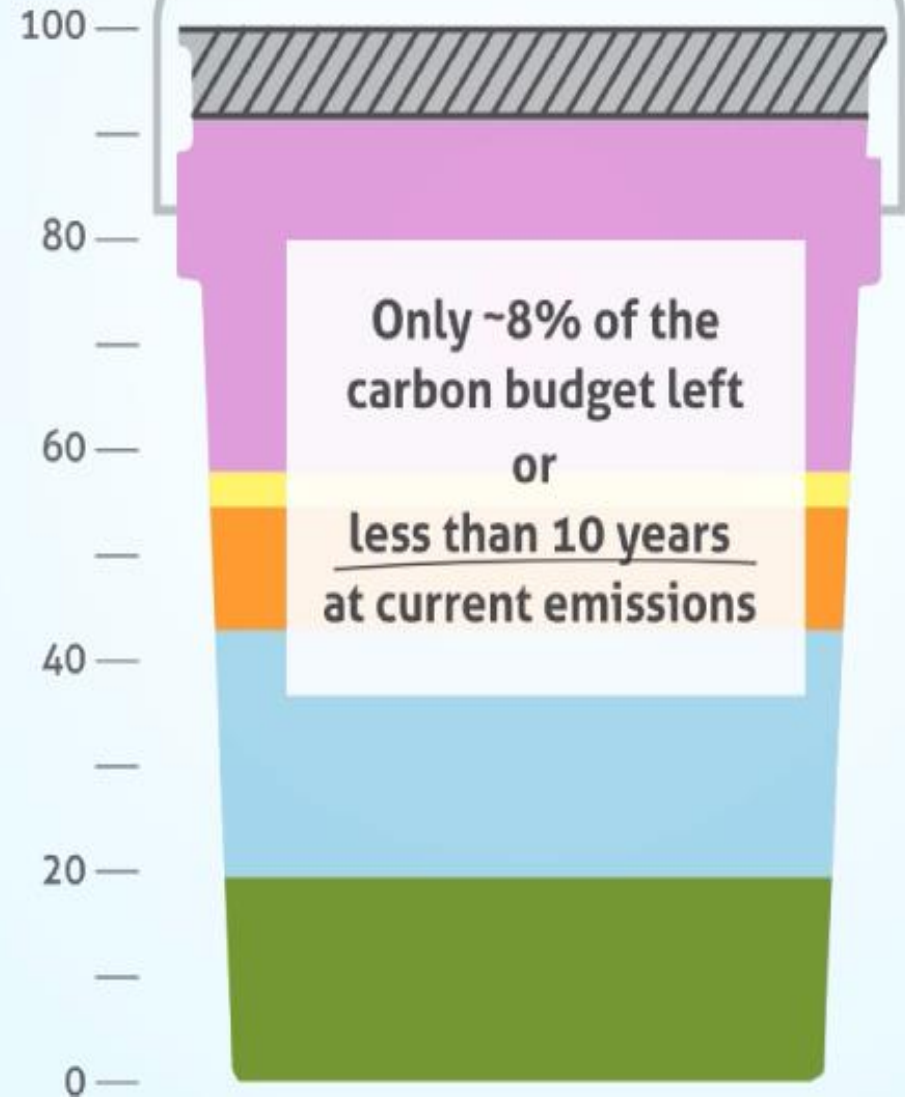


Rest of the World

USA

EU

2020



Rest of the World

India

China

USA

EU

A wide-angle, low-perspective shot of a multi-lane highway. The road is paved with dark asphalt and has white dashed lane markings. On both sides of the road are concrete barriers with a series of small, rectangular openings. In the background, there are several multi-story residential buildings and a distinctive, curved, modern building. The sky is clear and blue. The overall scene is empty, suggesting a lockdown or a quiet day in a city.

CO₂-LOCKDOWN

The themes selected for the 2014-2020 period address smart and sustainable growth. Our Member States carefully chose them to address North-West Europe's main challenges.



Innovation

Helping enterprises innovate

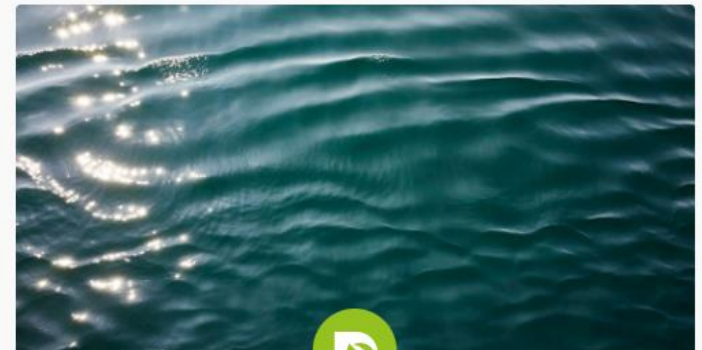
INNOVATION



Low carbon

Supporting the shift towards a low carbon economy in all sectors and promoting sustainable transport

LOW CARBON



Resource & materials efficiency

New ways to produce more value with fewer materials

RESOURCE & MATERIALS EFFICIENCY

The themes selected for the 2014-2020 period address smart and sustainable growth. Our Member States carefully chose them to address North-West Europe's main challenges.

Reduction



Innovation

Helping enterprises innovate

INNOVATION



Low carbon

Supporting the shift towards a low carbon economy in all sectors and promoting sustainable transport

LOW CARBON

Uptake



Resource & materials efficiency

New ways to produce more value with fewer materials

RESOURCE & MATERIALS EFFICIENCY

Interreg

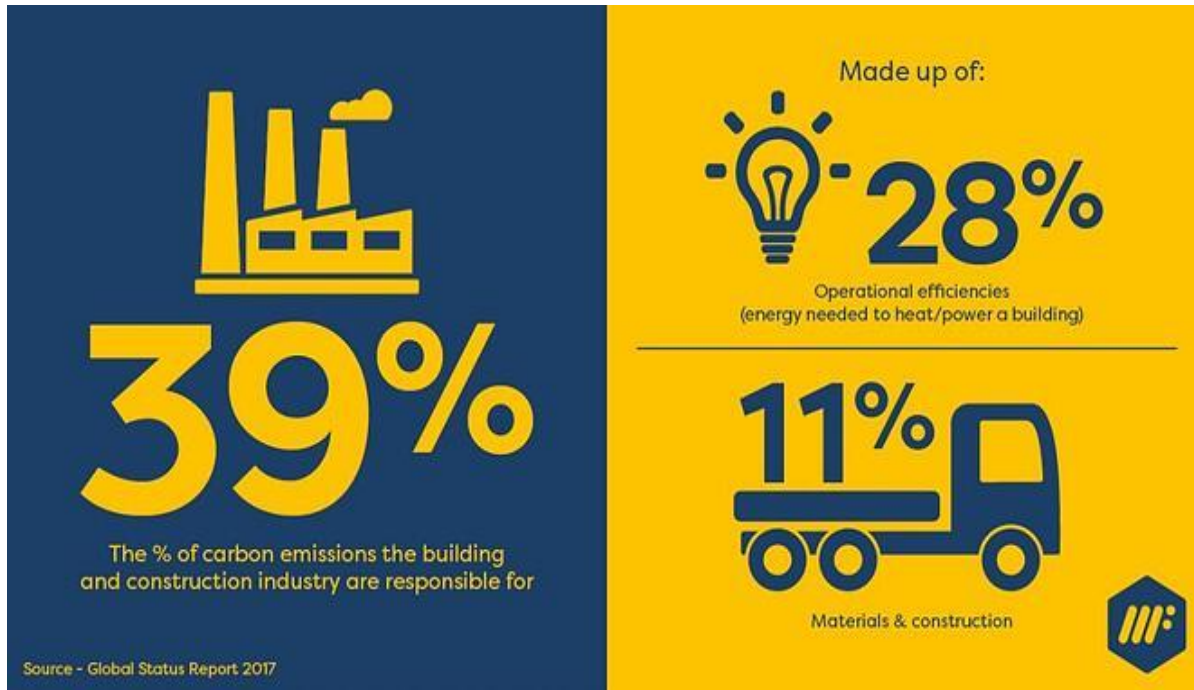


EUROPEAN UNION

North-West Europe

Housing 4.0 Energy

European Regional Development Fund



Interreg

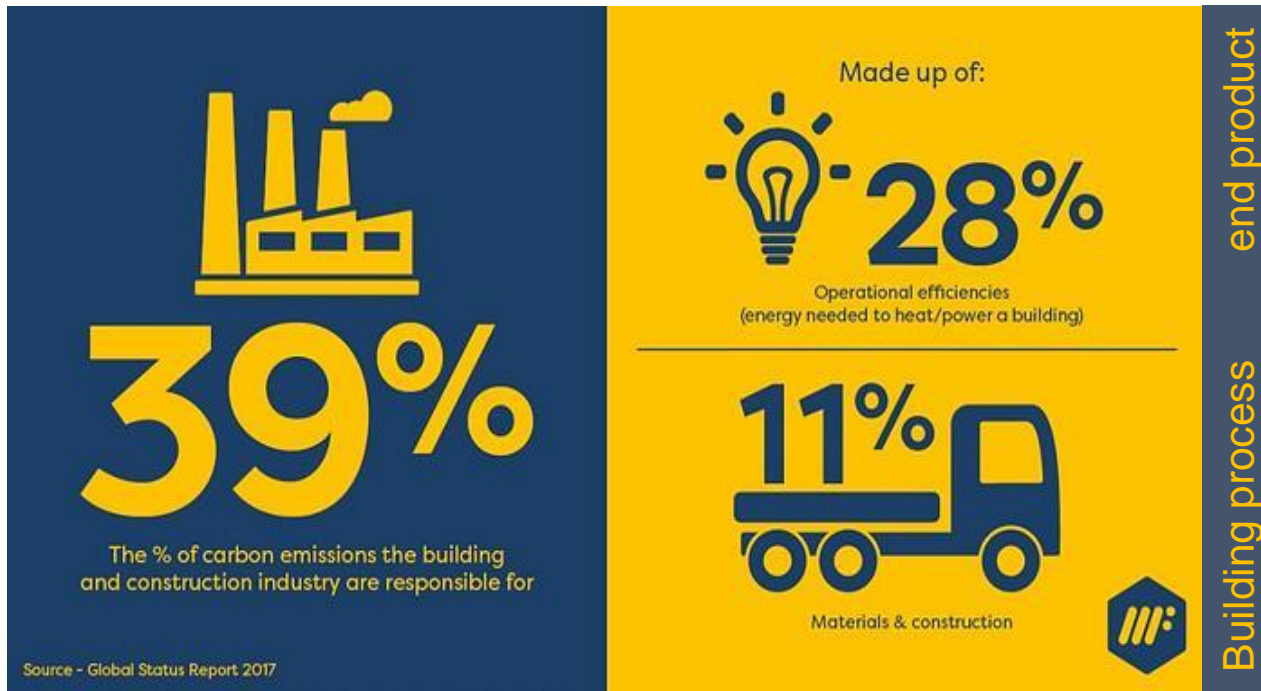


EUROPEAN UNION

North-West Europe

Housing 4.0 Energy

European Regional Development Fund



Interreg



EUROPEAN UNION

North-West Europe

Housing 4.0 Energy

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39%

The % of carbon emissions the building and construction industry are responsible for

Source - Global Status Report 2017

Made up of:



28%

Operational efficiencies
(energy needed to heat/power a building)

11%



Materials & construction



end product

Building process

Affordable houses for small households (demand/no supply)

25% cheaper to build

60% reduction in CO2 emissions (build + usage)

Monitor reduction

Digital design and automated production

Platform to replicate

Training program and guidebook

Interreg




EUROPEAN UNION

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Housing 4.0 Energy

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Materials & construction



end product

Building process

Develop some bloody good, attractive, affordable and energy efficient houses and building systems...

...and make it dead easy to replicate them!

North-West Europe Housing 4.0 Energy

European Regional Development Fund



9 partners in the NWE region:
4 pilot projects/partners
3 innovation hubs / energy agencies
2 partners in research and education
46 houses

WikiHouse Almere | open source | customisable | affordable | energy efficient | digitally produced | self build



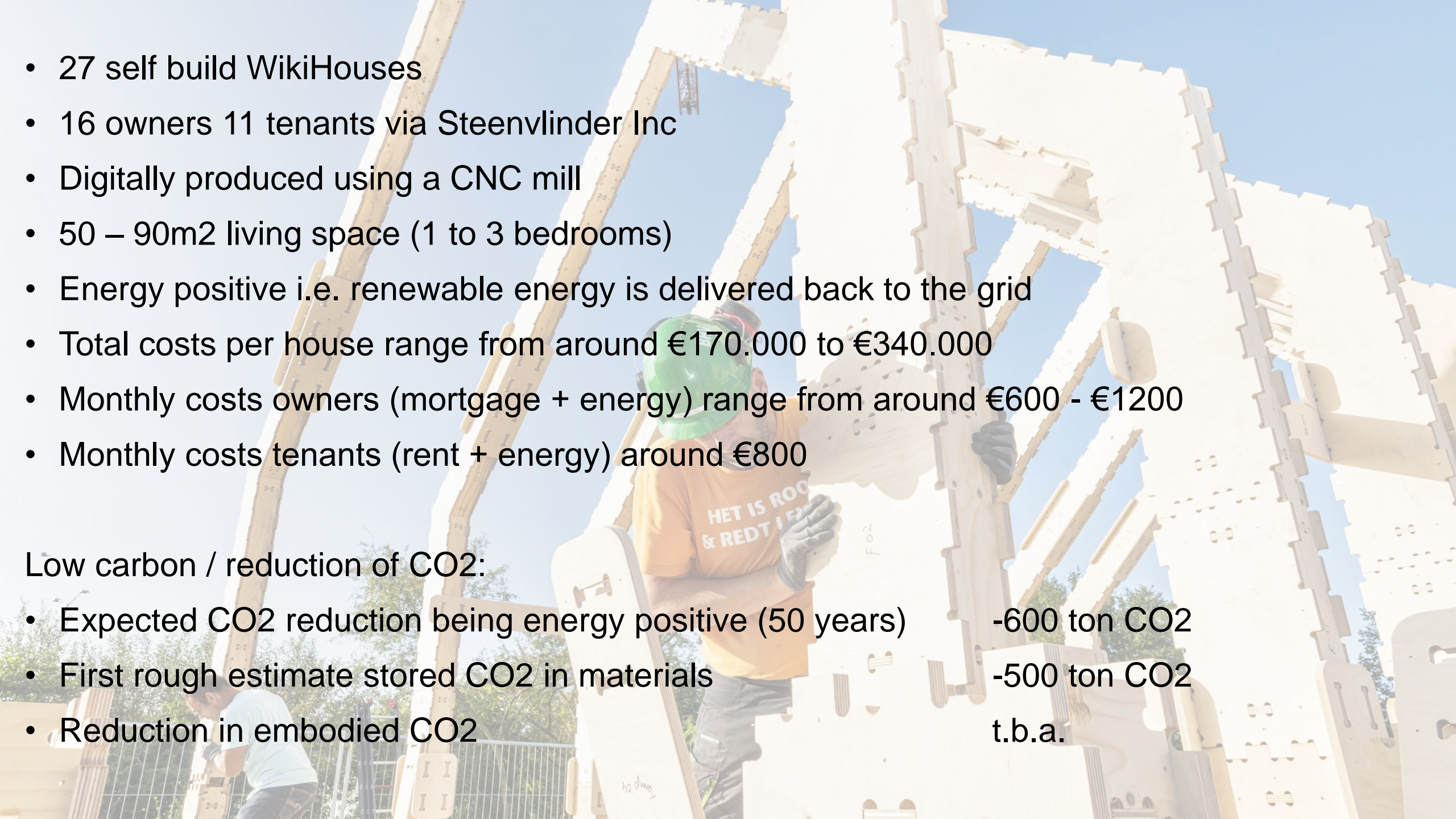






VPRO Tegenlicht 'Wonen buiten de box'



- 
- 27 self build WikiHouses
 - 16 owners 11 tenants via Steenvlinder Inc
 - Digitally produced using a CNC mill
 - 50 – 90m² living space (1 to 3 bedrooms)
 - Energy positive i.e. renewable energy is delivered back to the grid
 - Total costs per house range from around €170.000 to €340.000
 - Monthly costs owners (mortgage + energy) range from around €600 - €1200
 - Monthly costs tenants (rent + energy) around €800

Low carbon / reduction of CO₂:

- Expected CO₂ reduction being energy positive (50 years) -600 ton CO₂
- First rough estimate stored CO₂ in materials -500 ton CO₂
- Reduction in embodied CO₂ t.b.a.

- 27 self build WikiHouses
- 16 owners 11 tenants via Steenvlinder Inc
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- 50 – 90m2 living space (1 to 3 bedrooms)
- Energy positive i.e. renewable energy
- Total costs per house range from around
- Monthly costs owners (mortgage + energy)
- Monthly costs tenants (rent + energy)

Interested? Join the excursion!
Monday 15.00
Tuesday 13.15


Low carbon / reduction of CO2:

- Expected CO2 reduction being energy positive (5 years) -600 ton CO2
- First rough estimate stored CO2 in materials -500 ton CO2
- Reduction in embodied CO2 t.b.a.

Mobble building system | prefabricated modules | flexible | biobased | very affordable | energy efficient








Interested? Breakout session 3
and 7!



Germany | Thoma Holz | Dowel Laminated Timber (DLT) i.e no glue | prefab using sub assemblies | collapsable



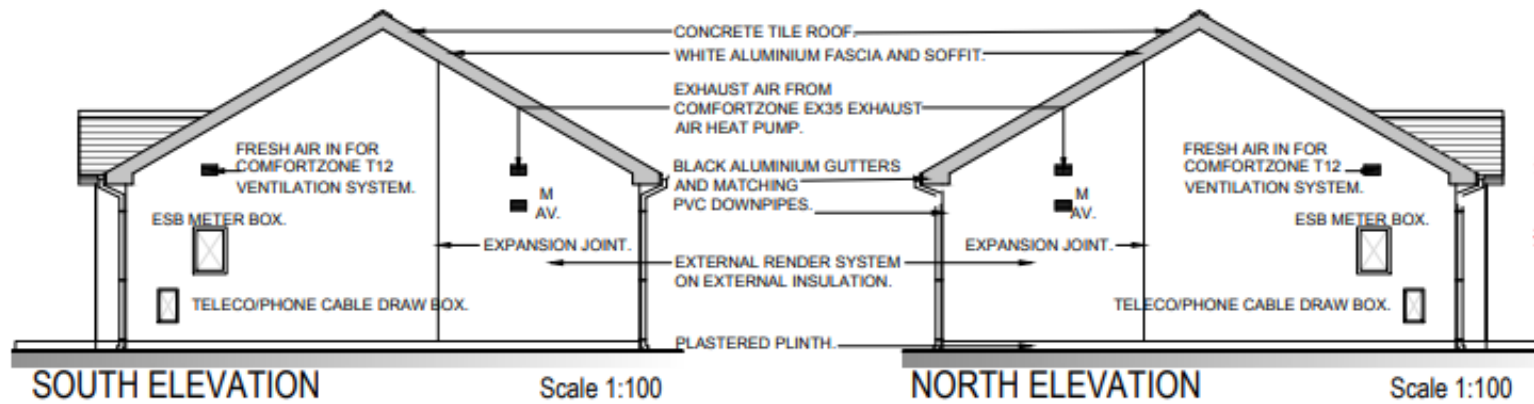
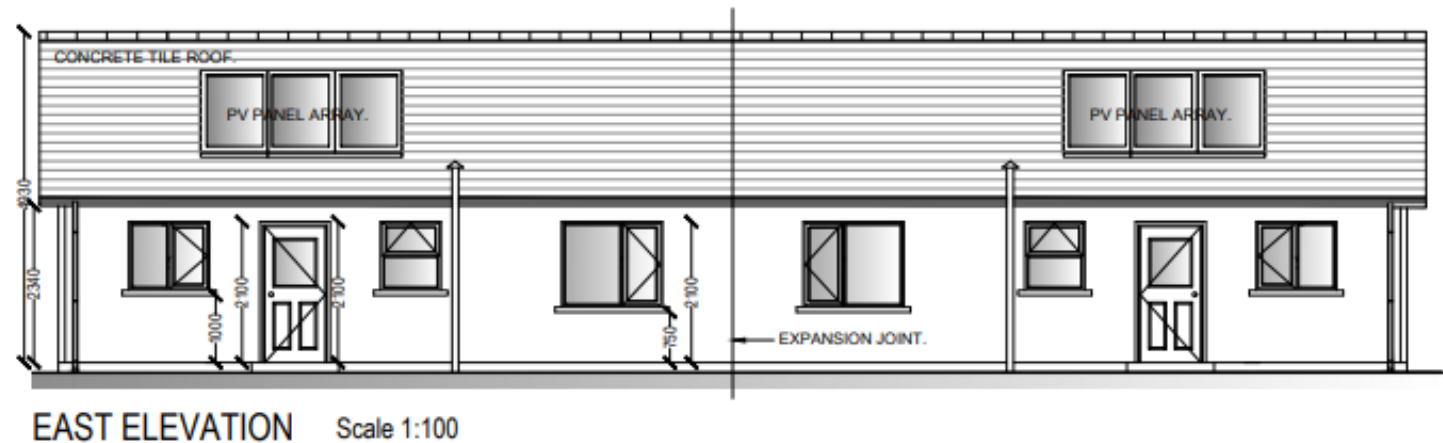
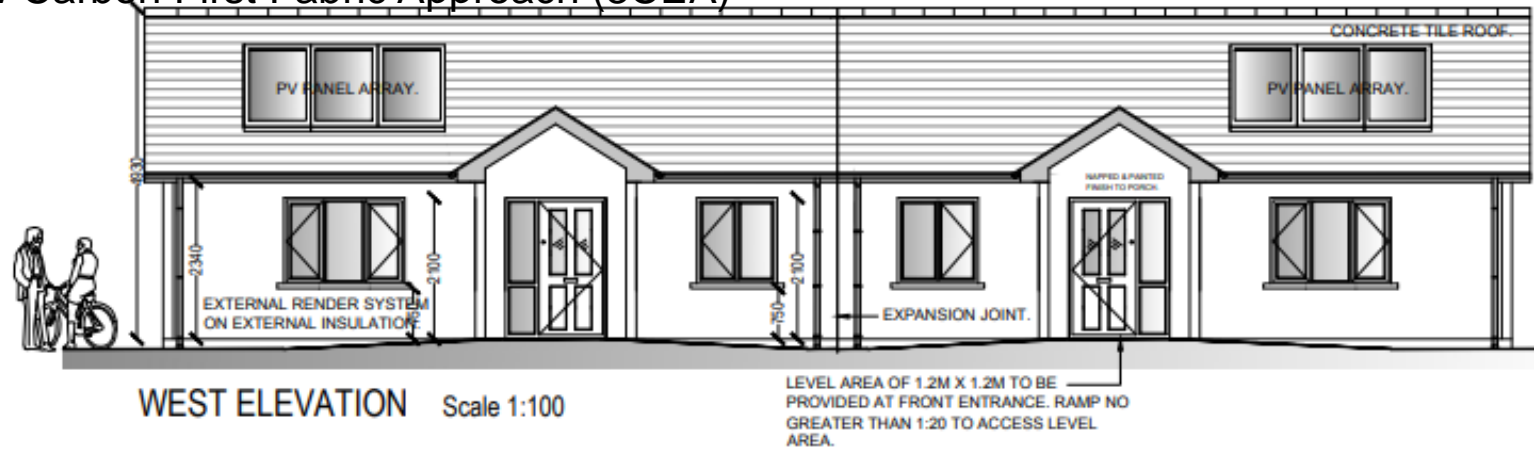


Interested? Breakout session 4
and 8 and see Florian Thoma
on Tuesday 10.10




Thoma

Carlow and Kilkenny | Low Carbon First Fabric Approach (3CEA)



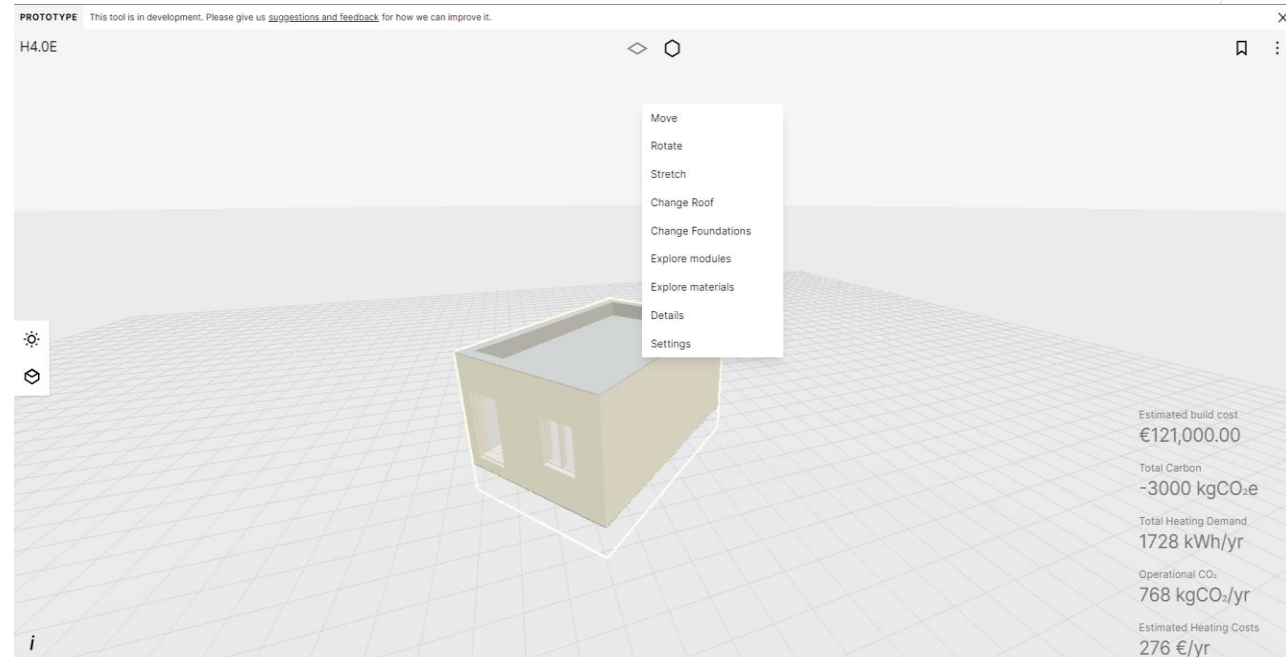
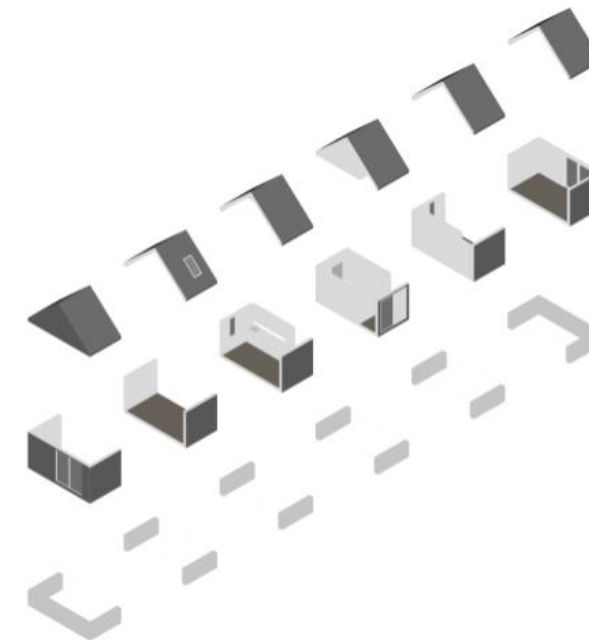




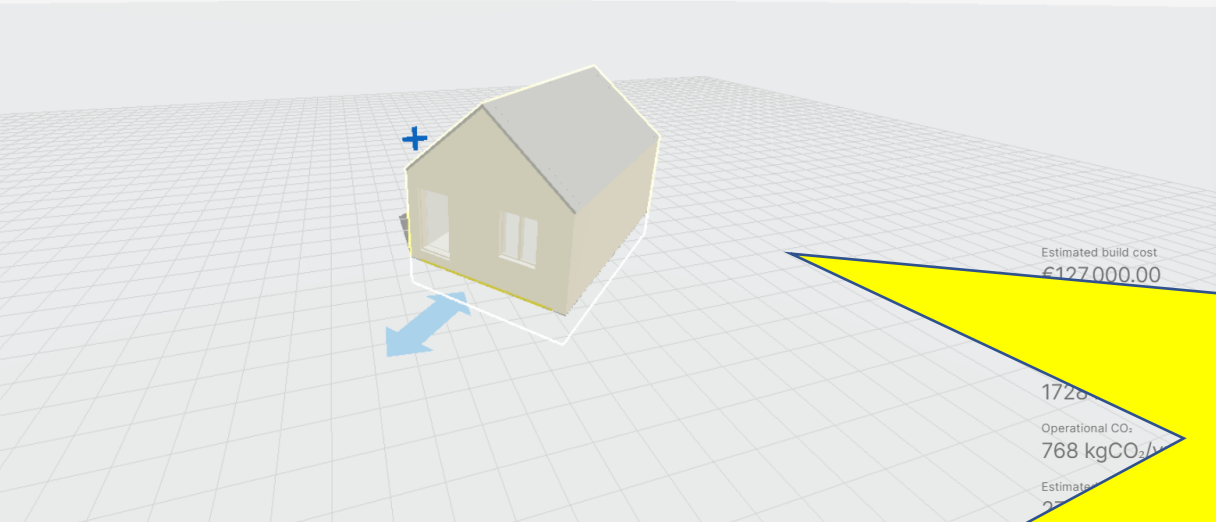
Interested? Breakout session 1
and 5!

- Technic is there. See H4.0E pilots, but also the market/building industry
- But there are financial, legal, cultural barriers
- Focus on further improvement and upscale of current technics/systems/etc
- H4.0E will do that in 3 different ways...

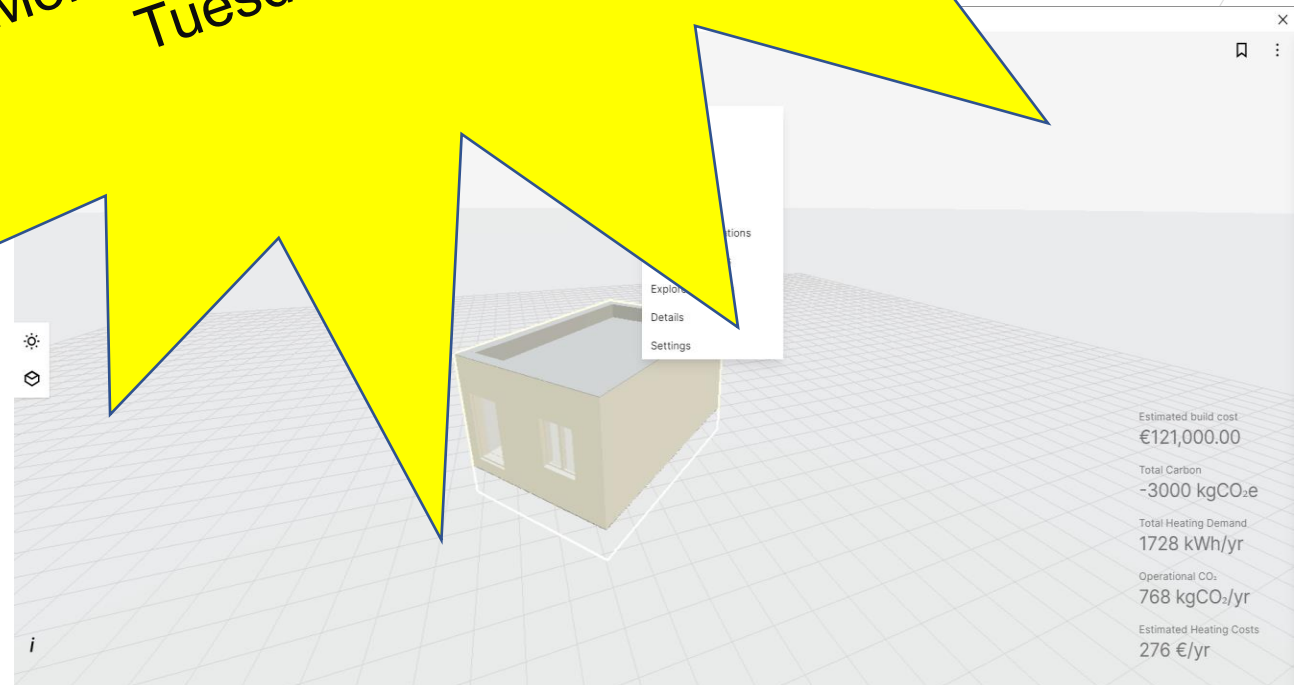
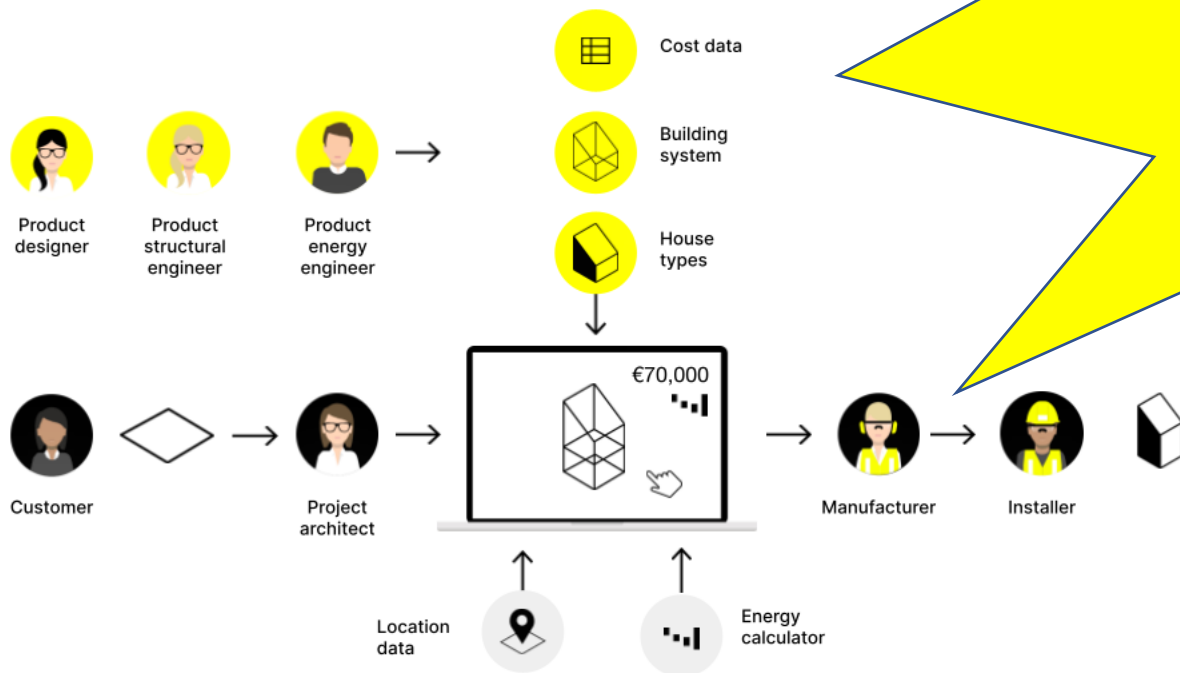




H4.0E platform



Interested? See Alastair Parvin
Monday 14.05 – 14.15 (preview)
Tuesday 9.45 – 10.10





- Introduction to Housing 4.0 Energy
- UNIT 1 - CONSTRUCTION INDUSTRY GUIDE TO NZEB
 - Climate Change & the Role of NZEB
 - Climate Change & the Role of NZEB Recap Quiz
 - Sustainable Building Fabric
 - Sustainable Building Fabric Recap Quiz
 - Low Carbon Building Materials

Section 1 of 36

H4.0E training modules

Introduction to Housing 4.0 Energy

Interreg North West Europe project Housing 4.0 Energy (H4.0E) aims to develop a market for small, affordable near-zero energy homes (NZEHS) by adapting and applying new digital technologies, thus stimulating both consumer and supplier interest. Made up of five partner countries in North West Europe (NWE).

- Ireland
- Germany
- Belgium
- Netherlands
- UK

The three and a half year H4.0E project will facilitate the uptake of low carbon and digital

rise.articulate.com/share/4Bj8nnRXruCsDhtYaOV6qGr2RtY0jOMk#/lessons/MjXKb2rTyxGUf2xpur7Y_G7UHRNrBYtY

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Housing 4.0

Energy (English)

0% COMPLETE

Introduction to Housing 4.0 Energy

UNIT 1 - CONSTRUCTION INDUSTRY GUIDE TO NZEB

Climate Change & the Role of NZEB

Climate Change & the Role of NZEB Recap Quiz

Sustainable Building Fabric

Sustainable Building Fabric Recap Quiz

Low Carbon Building Materials

Section 1 of 36

Introduction to Housing 4.0 Energy

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Type here to search

23:20

19/05/2022

Rain coming



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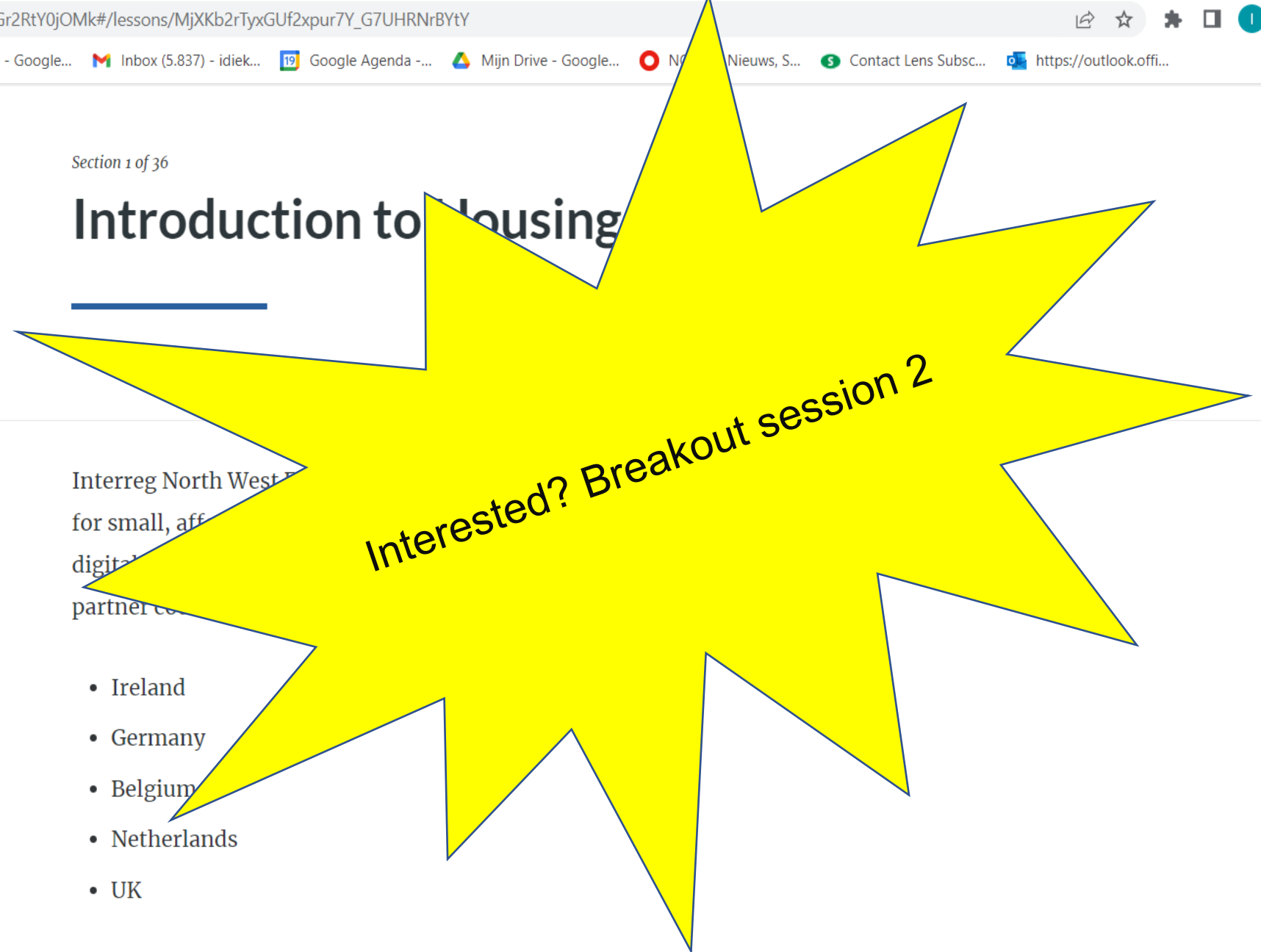
Section 1 of 36

Introduction to Housing

Interreg North West Europe for small, affordable digital partner co

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Interreg North-West Europe **Housing 4.0 Energy** European Regional Development Fund

Housing 4.0 Energy Guidebook



VLAAMS-
BRABANT



Elfi
TECH

Gemeente Almere



Delft University of Technology



3cea
diverg sustainability



SouthWest
College

Open
Systems
Lab

KAMP



Thoma

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