15 November 2023, Brussels

Fostering experiences from EU innovation projects to accelerate a sustainable built environment

Drive 0 Final Symposium and EU Clustering Workshop

European Committee of the Regions

DRIVE

StepUP

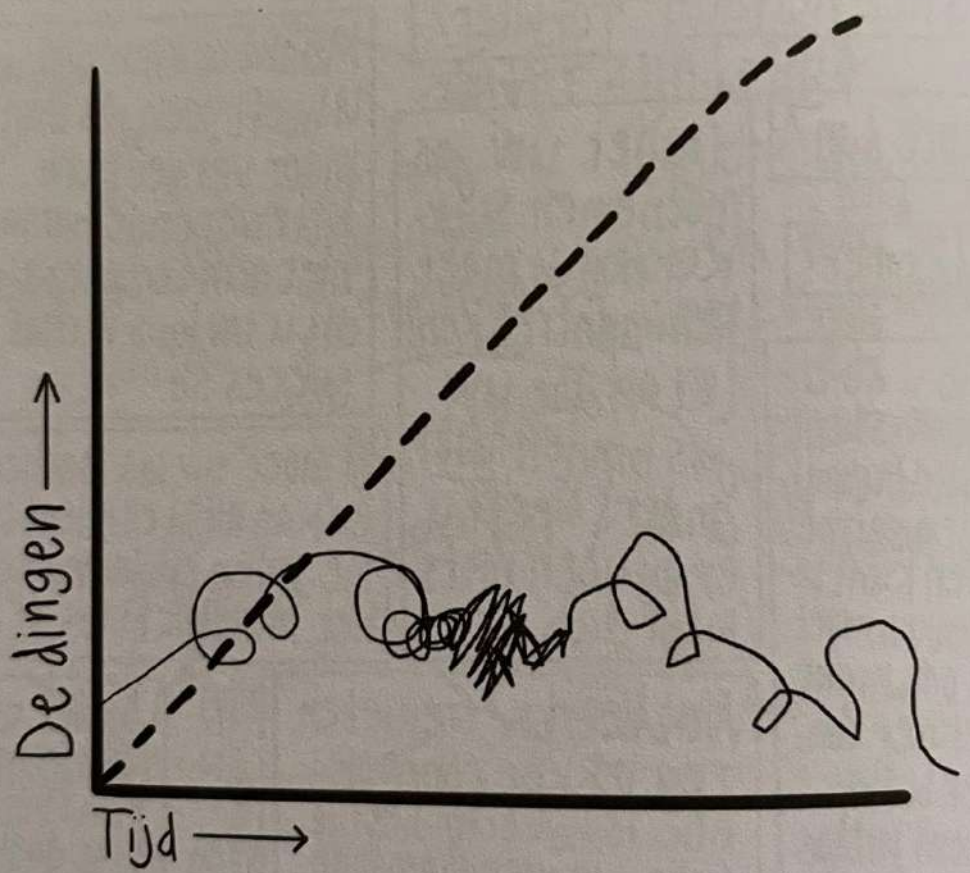
PLURAL

INFINITE BUILDINGRENOVATION

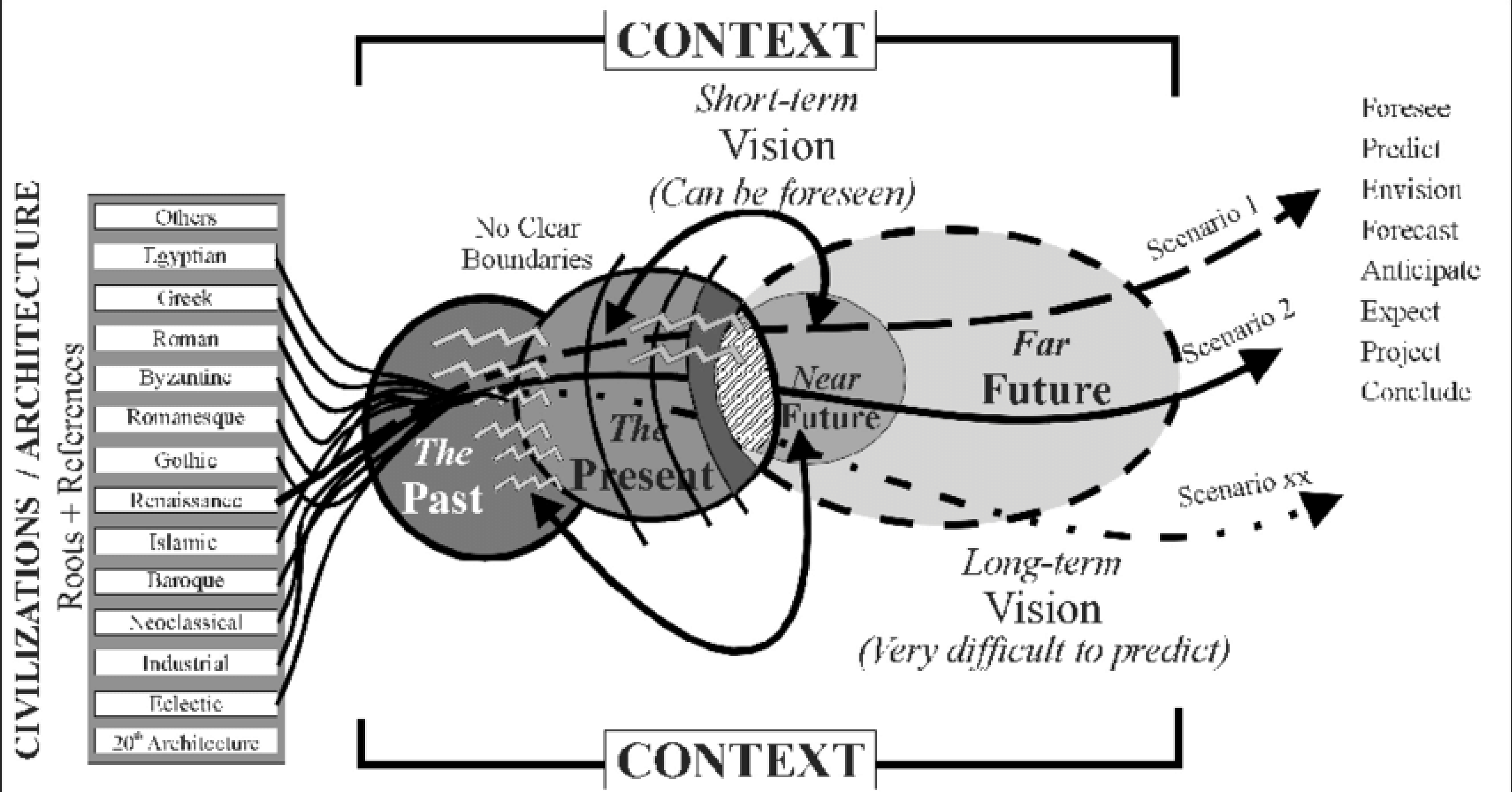
BuildUPspeed

giga regio factory by energie sprong

De dingen, en hoe ze altijd gaan.



Source: Katinka Polderman, beslisbos, 2023



Source: Adel Abdou, THE IMPACT OF CYBERSPACE AND GLOBALIZATION ON THE FUTURE OF ARCHITECTURE: VISIONARY INSIGHT, 2003

Agenda

1. Welcome & Keynotes	9.30 – 10.15
Coffee break & Poster exhibition *'Projects in the spotlight'*	10.15 – 10.45
2. Experiences from the projects to revolutionize construction	10.45 – 12.00
Coffee break	12.00 – 12.15
3. From practice to policy to ignite transformation	12.15 – 13.30
Lunch break	13.30 – 14.30
4. Illuminating opportunities to unleash the solutions market potential	14.30 – 15.45
5. Final conclusions	15.45 – 16.00
Networking Reception	16.00 – 17.00

European Committee of the Regions DRIVE StepUP PLURAL INFINITE BUILDINGRENOVATION BuildUPspeed giga regio factory by energie sprong

1st session:

Welcome & Keynotes

Drive 0 Final Symposium and EU Clustering Workshop

DRIVE

Hosted by European Committee of the Regions

Drive 0 Final symposium & Clustering workshop

Welcome by European Committee of the Regions

Andres Jaadla

CoR Member , CoR Rapporteur .

Board member of Housing Europe

Chairman of Estonian Union of Cooperative Housing Assotiations

Welcome ☺


Euroopa Regioonide
Komitee
Comité européen
des régions
Europees Comité
van de Regio's
www.cor.europa.eu

The European Committee of the Regions

- The **European Committee of the Regions** is made up of 329 **members** representing the **regional** and local authorities of the 27 **Member** States of the European Union.
- The **European Committee of the Regions** (**CoR**) is the European Union's (EU) assembly of local and regional representatives that provides sub-national authorities (i.e. regions, counties, provinces, municipalities and cities) with a direct voice within the EU's institutional framework.
- Established in 1994, the CoR was set up to address two main issues.
- **First**, about three quarters of EU legislation is implemented at local or regional level, so local and regional representatives needed to have a say in the development of new EU laws.
- **Second**, there were concerns about a widening gap between the public and the process of European integration; involving the elected level of government closest to the citizens was one way of closing the gap.


CoR local event 2023
A.Jaadla

CoR opinion

„Smart, sustainable and affordable housing as a tool for local authorities to face multiple challenges „

Working document

…

First discussion and adoption of the draft opinion at the COR COTER meeting on 9 February 2024;

Adoption at the plenary session on 17-18 April 2024 (date to be confirmed).

„ Smart, sustainable and affordable housing as a tool for local authorities to face multiple challenges“

Housing policies have varied traditions across member states and having as detailed as possible picture about the key challenges, solutions and best practices will be paramount in framing this opinion.

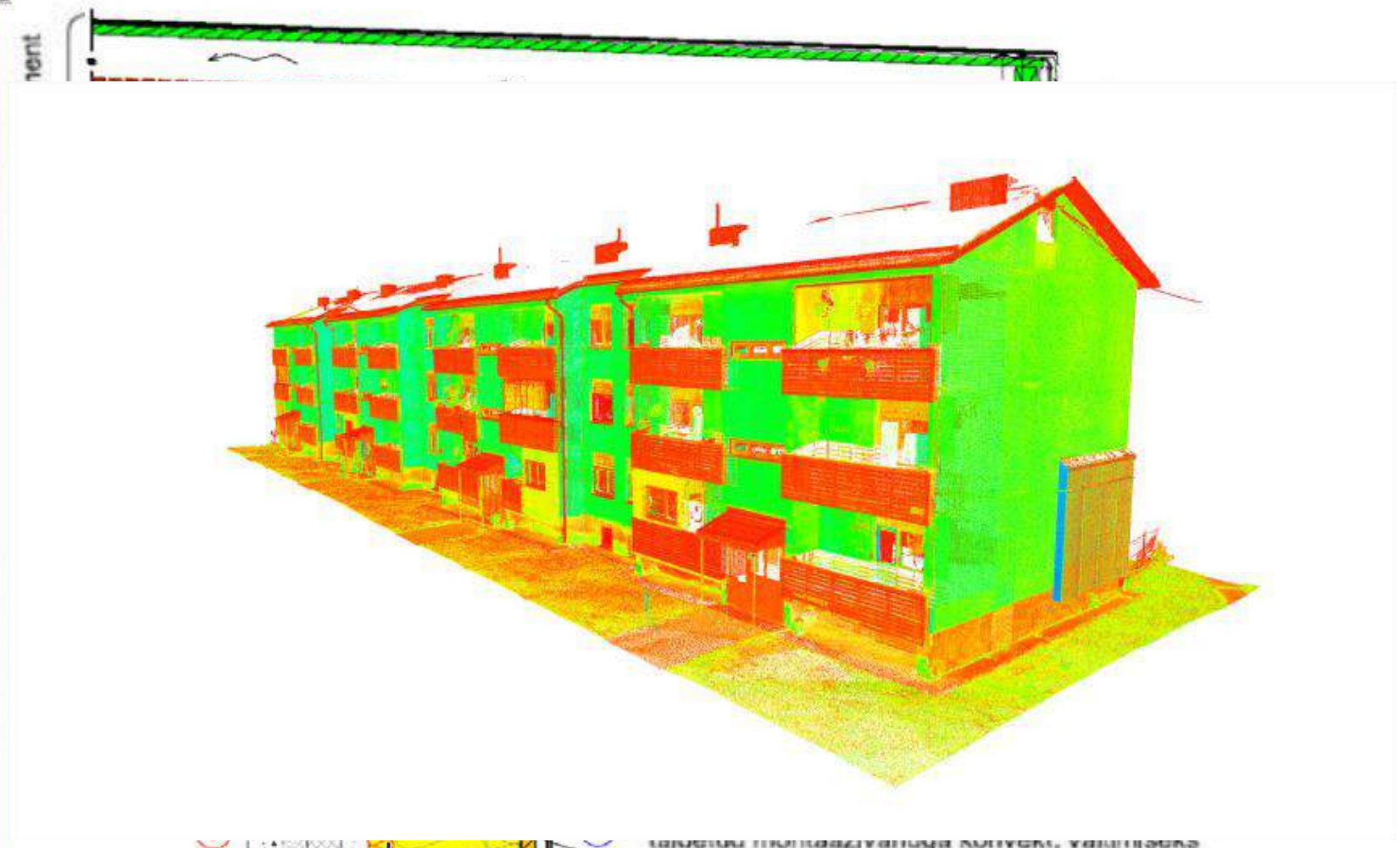
one priority of opinion - **Renovation, modernization, energy efficiency, digitalisation and smart homes**:

- **Share experiences and initiatives related to renovating and modernizing housing stock to meet sustainability and quality standards.**
- Share information on **energy-efficient housing solutions, policies, and innovations** that have been implemented in your region.
- Are safety concerns being addressed before/during renovation and are seismic upgrades, flooding risks etc being considered alongside energy efficiency upgrades?
- **How is digitalisation helping achieve carbon emission reductions**?
- **Are the smart home solutions worthy of a streamlined public support and a wider rollout?**
- Does your city or region have a specific body or lab to promote these solutions and what are the results?

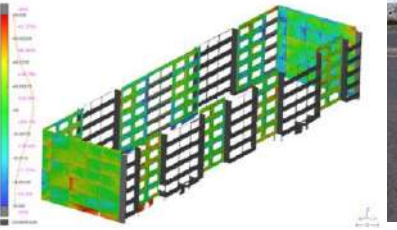
… Estonian experience - providing innovation for future
… deep renovation - using additional prefabricated insulation elements

DRIVE

European Committee of the Regions



… providing innovation for future - deep renovation - using additional prefabricated insulation elements



DRIVE

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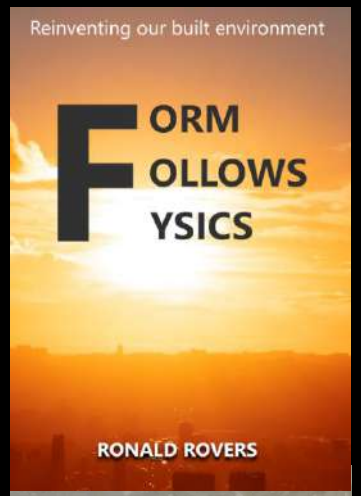
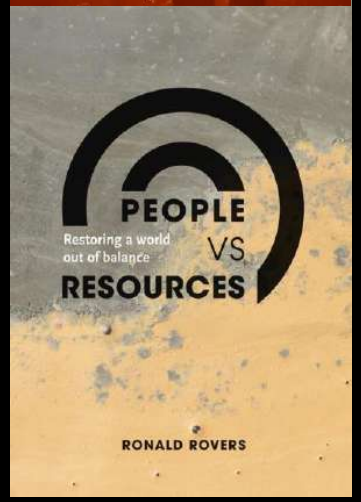
- Thank You ！☺

Research Institute Built Environment of Tomorrow





Post Fossil Built environment

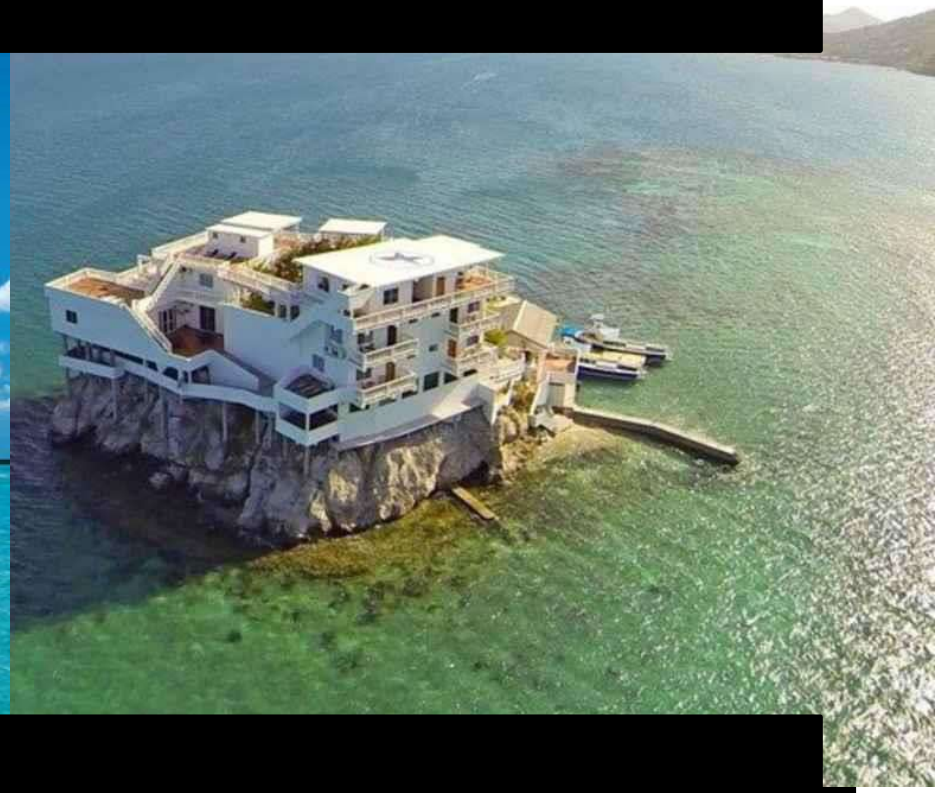
Ronald Rovers,

Lectures, workshops, masterclasses, research.

SBScentre/RiBuilT research, owner
ex-Fellow TUE fac Built Environment

www.ronaldrovers.com www.ribuilt.eu

People vs Resources, ch.1

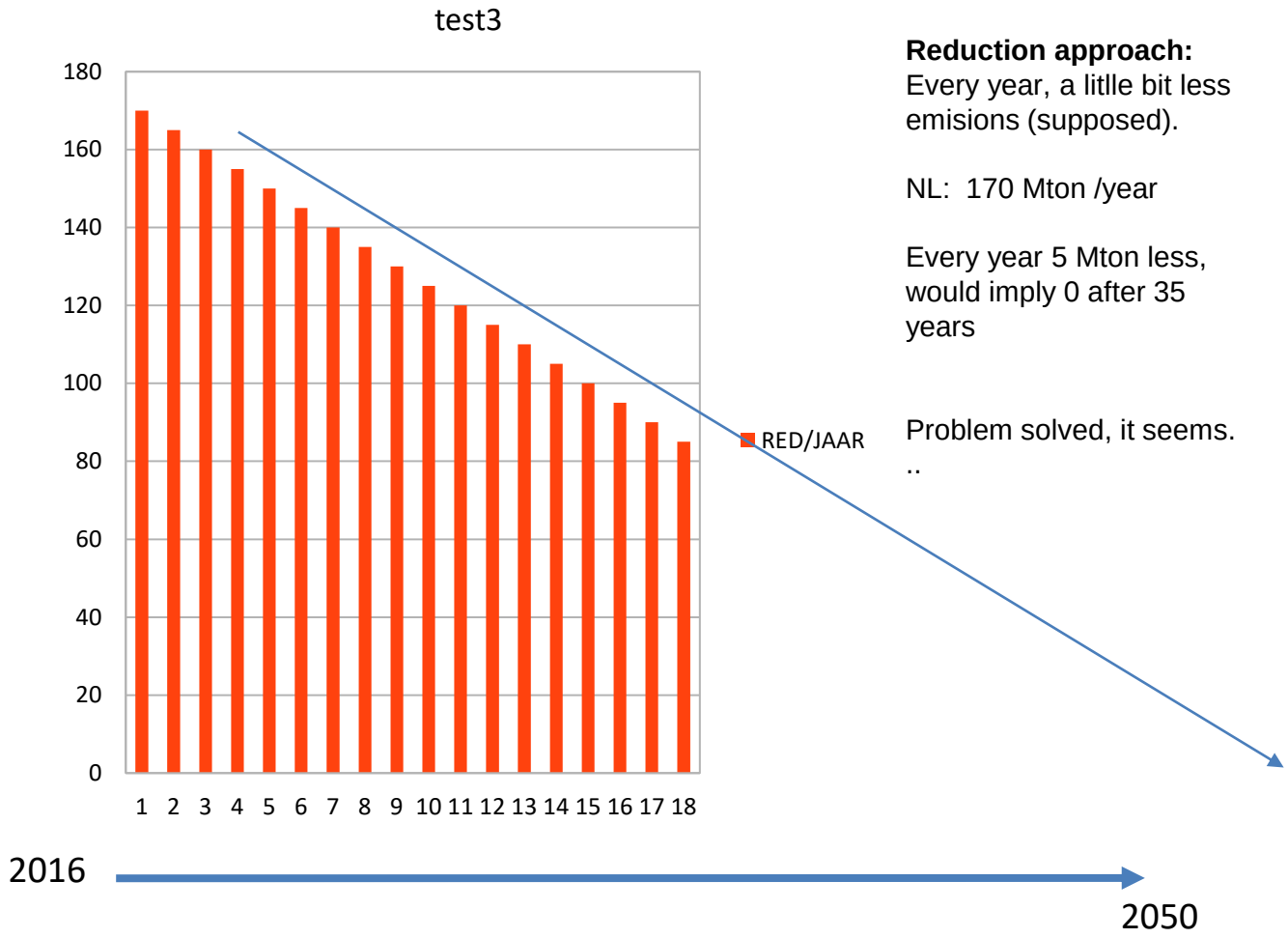


A tropical beach resort,
without beaches and
without tropical forest.

PPP:
People depleting Planet making Profit:

Using fossil Fuels.

We focus on just one of the side-effects: … CO2

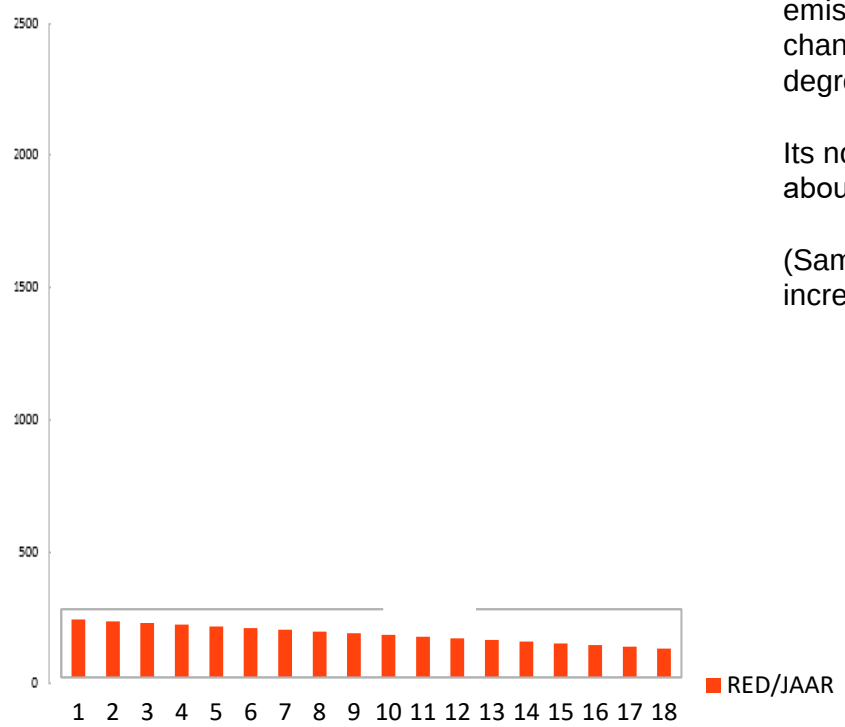


Reduction approach:
Every year, a litlle bit less emisions (supposed).

NL: 170 Mton /year

Every year 5 Mton less, would imply 0 after 35 years

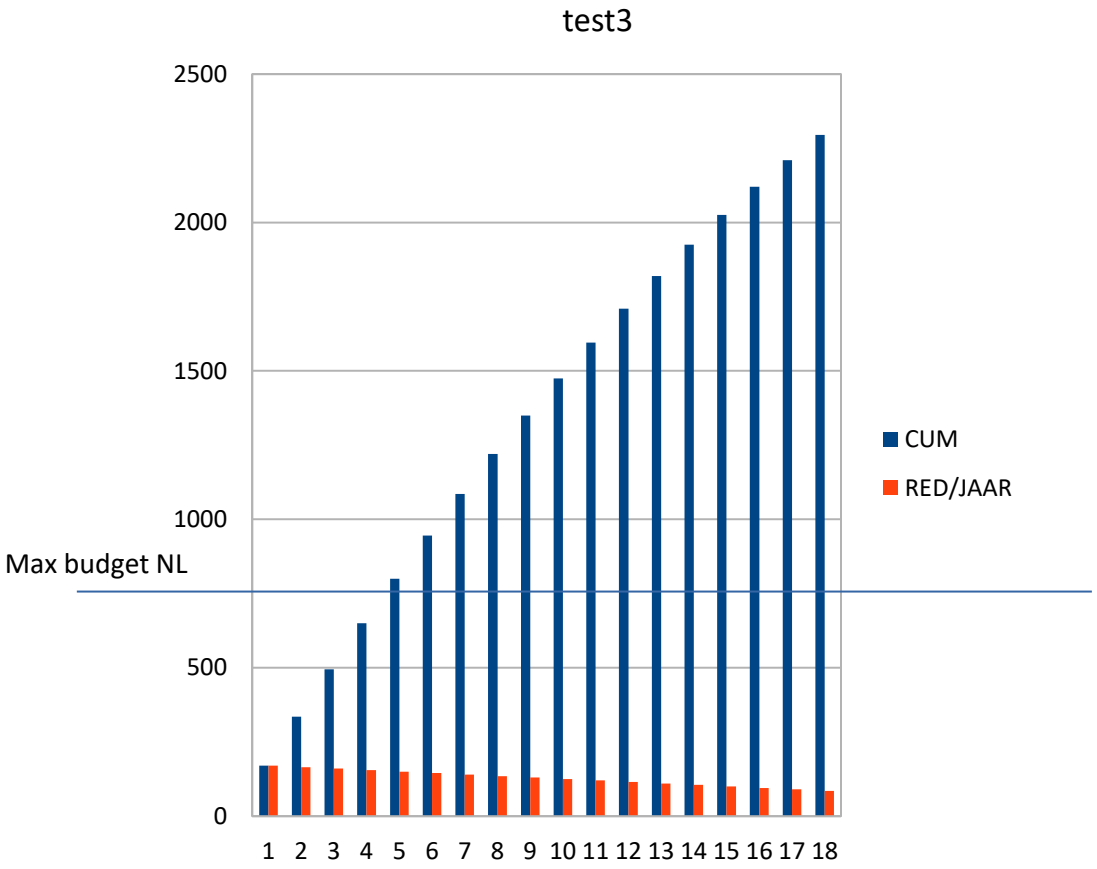
Problem solved, it seems.
..



However there is a maximum budget of CO2 emissions, to have a chance to stay below 1,5 degree.

Its not about reduction, but about adding up…

(Same graph, scale increased)



This is what really happens , cumulative there is a huge increase Despite reductions, and after 5 years the budget is depleted, and 1,5 degree out of sight.

(Which is about now, for NL.)

(756 Mt – (2018) fair share for NL with 1,5 degree and 66% chance).

People vs Resources, ch.1

Nothing is added anymore...

Except solar energy...

All transition scenario’s are realized with continued burning of fossil fuels.

So imagine : tomorrow we stop with fossil fuels: whats possible then?

Knowing this, we hould optimze already for a world without fossil fuels.

Post Fossil

Post Fossil:

is living from the sun.

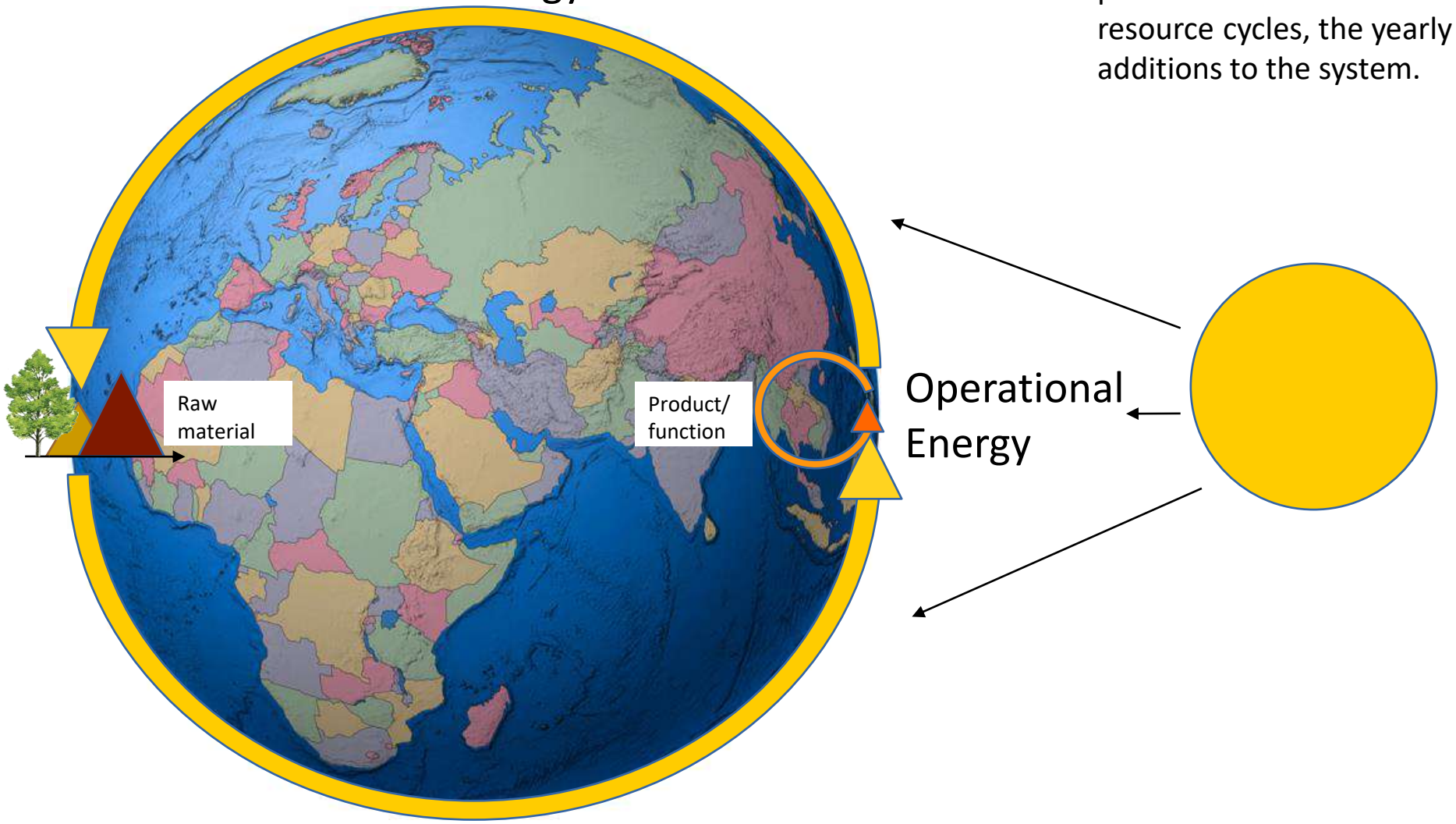
Only.

And the land
to capture-convert-store it

Its about OE , EE and CE
Operational, embodied and circular energy

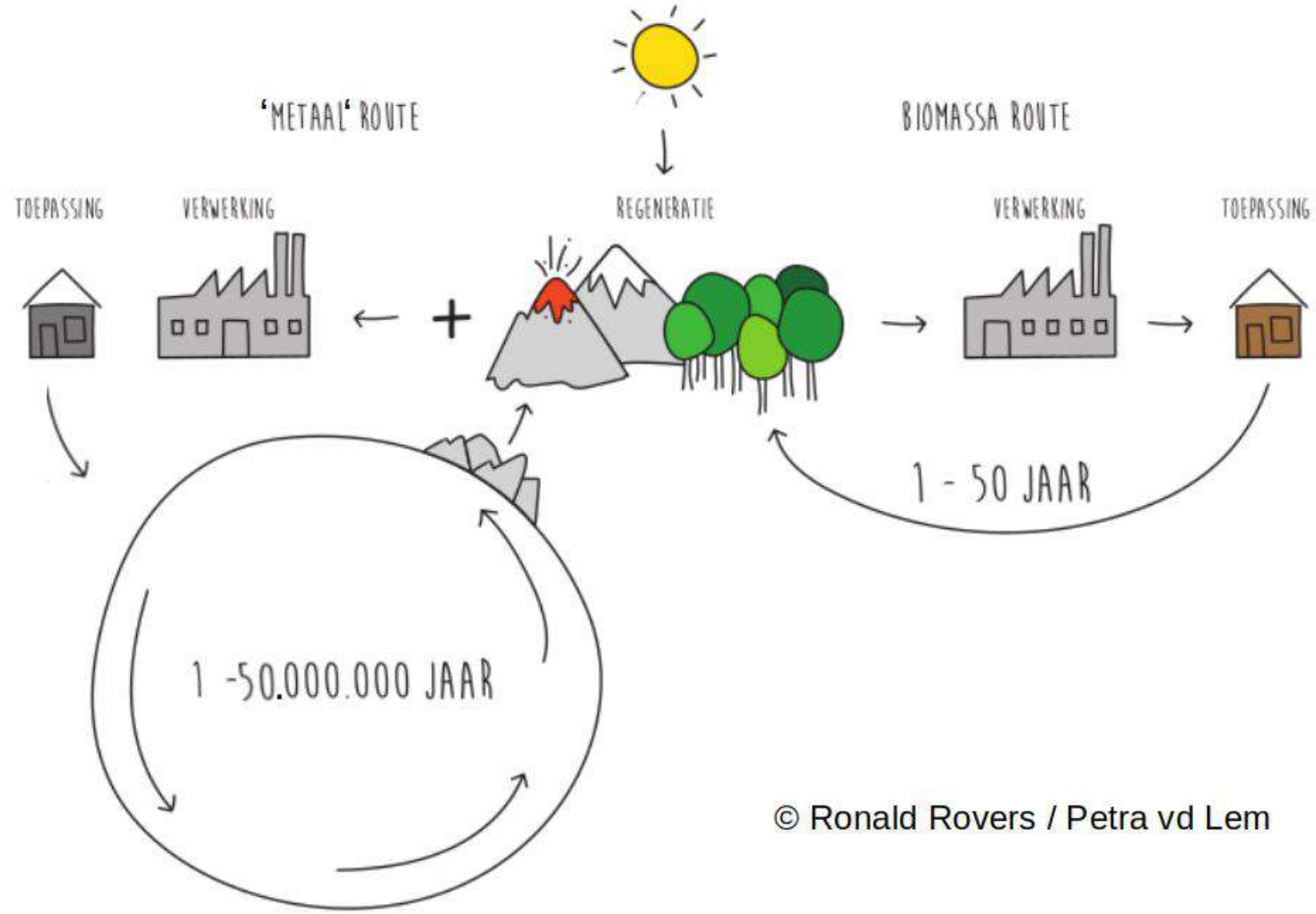
Circular Energy

Living/Building within the potentials of natural resource cycles, the yearly additions to the system.



Embodied Energy

Circular Energy:
All resources are renewable.
Only time range differs



Flow rates of resources, MAXergy 3.0, in " Embodied Land: ha-year"

	category	Basis.	example	'flow rate'	Energie input raw material	EE range /kg (raw mat.)	CO2 effect (current net)	CE range (in EL) [x]
1	**Regrowable resources** ('biobased')	(land-sun--labor	wood, bamboo, hemp flax, veggies, rapeseed, etc	normal: 2-20 ton/ha-year	limited	0-10	Negative-neutral tbd	CE equals growth speed
2	**Streaming resources** ('renewed, flowing')	Erosion-gravity-labor	Loam, sand, pebbles, rock stone,	Low: 1-2 ton/ha-year	average	5-30	Neutral- little positive* 0,5-4 kg/kg	Loam: Gypsum: 0,5 m2-year/kg biodiesel
3	**Sluggish resources** ('not renewed' extreme slow forming, depleting)	Earth fysics energy-labor	ores, mineral, metal, fossil energy,	Extreme Low 0-1 kg/ha-year	high	20-220 MJ	Positive 3-30 kg/kg	Iron: ~100 ha-year/kg copper: ~ 400 ha-year/kg
4	**'Manmade' resources** (inorganic. Not flowing)	Energy chemistry	Pvc, ppe,	Very low: < 1 kg/ha-year	high	60-140	Positive 9-20 kg/kg	3600 ha-year/gram (oilbasis)

https://iopscience.iop.org/article/10.1088/1755-1315/1078/1/012125/meta

RiBuilT
THE CONCEPT OF ZERO

ARM CHAIR

The ultimate goal for almost anybody who shapes trees, the first of these Arm Chairs was begun in 2012, and they have been lovingly cared for and subtly refined from that day. Soon it will be time for our first mass chair harvest.

This product takes approximately 7 years to make.
Probable delivery if ordered this year is 2024, but could be as early as 2023, or as late as 2026.

This product is currently out of stock. Pre-orders are available. Please contact us at enquiries@fullgrown.co.uk or via our contact form

SKU: N/A Category: Chairs

RiBuilT
THE CONCEPT OF ZERO

7 year x 2 m2 = 14 m2-year =
'Embodied Land'

Translated into Resource *flows* ***per capita for 'the island NL'***:

Available land **in NL = 0,2 ha pp**

Cat 1:	wood:	100	kg pp per year
Cat 2	loam/brick:	200	kg pp per year
Cat 3:	oil:	0,000054	gr pp per year
	iron:	0,14	kg pp per year
Cat 4:	n/a	-	

That is the yearly budget per capita to live from….

A steel bycycle

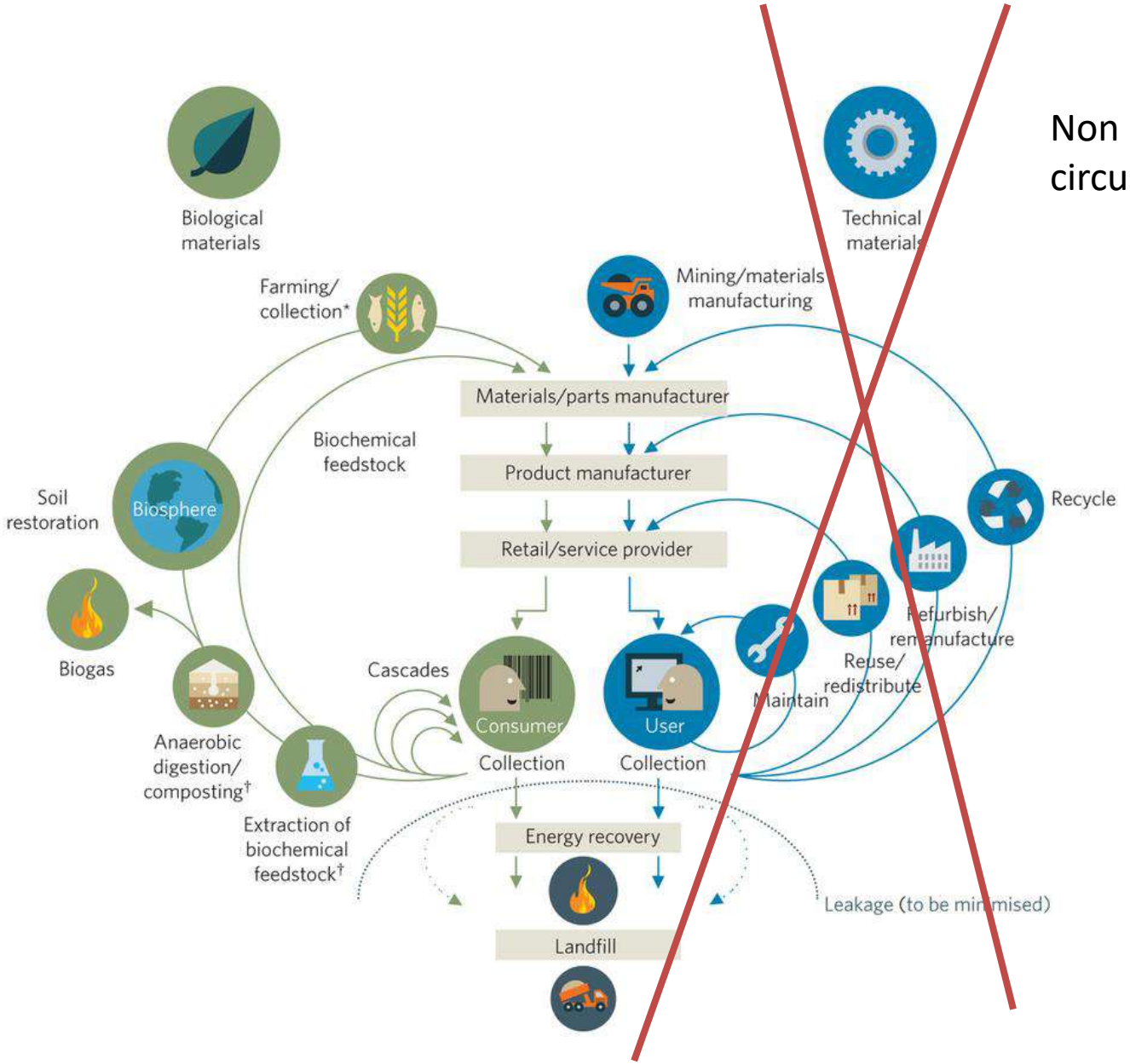
iron: 0,14 kg pp per year

Assume a simple bicycle weighs ~ 10 kg of steel…

it takes 71 years to collect the material…

Or ‘ to restore stock’

That’s ‘ a whole life steel share….’

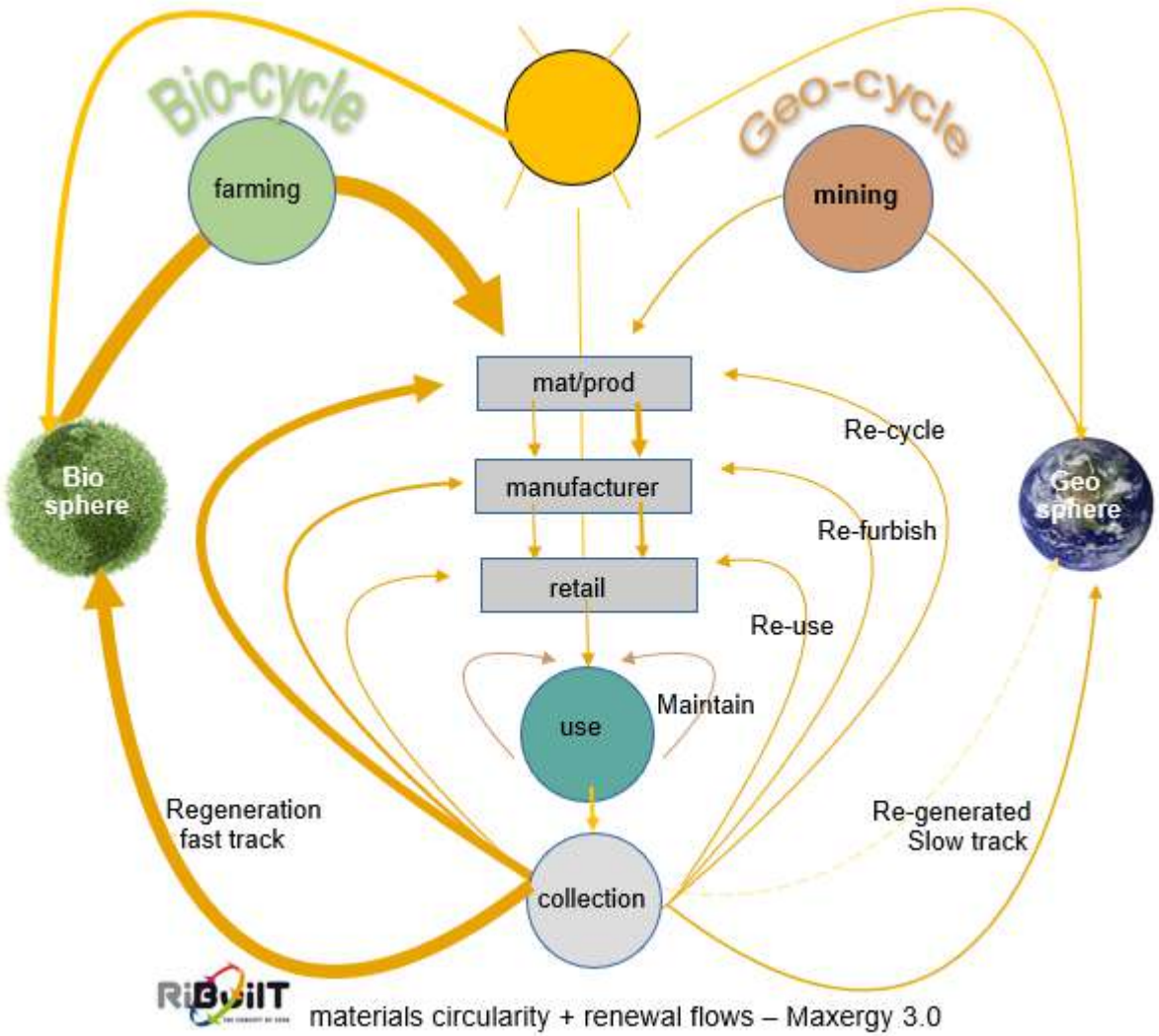


Non circular

Re-(al)circularity

High land productivity

Low Embodied energy

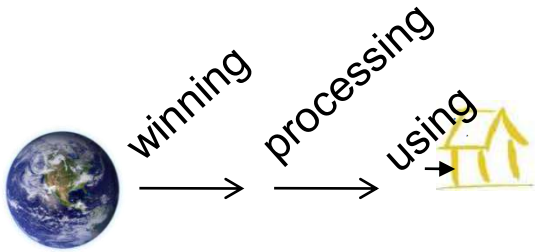


Low land productivity

High Embodied energy

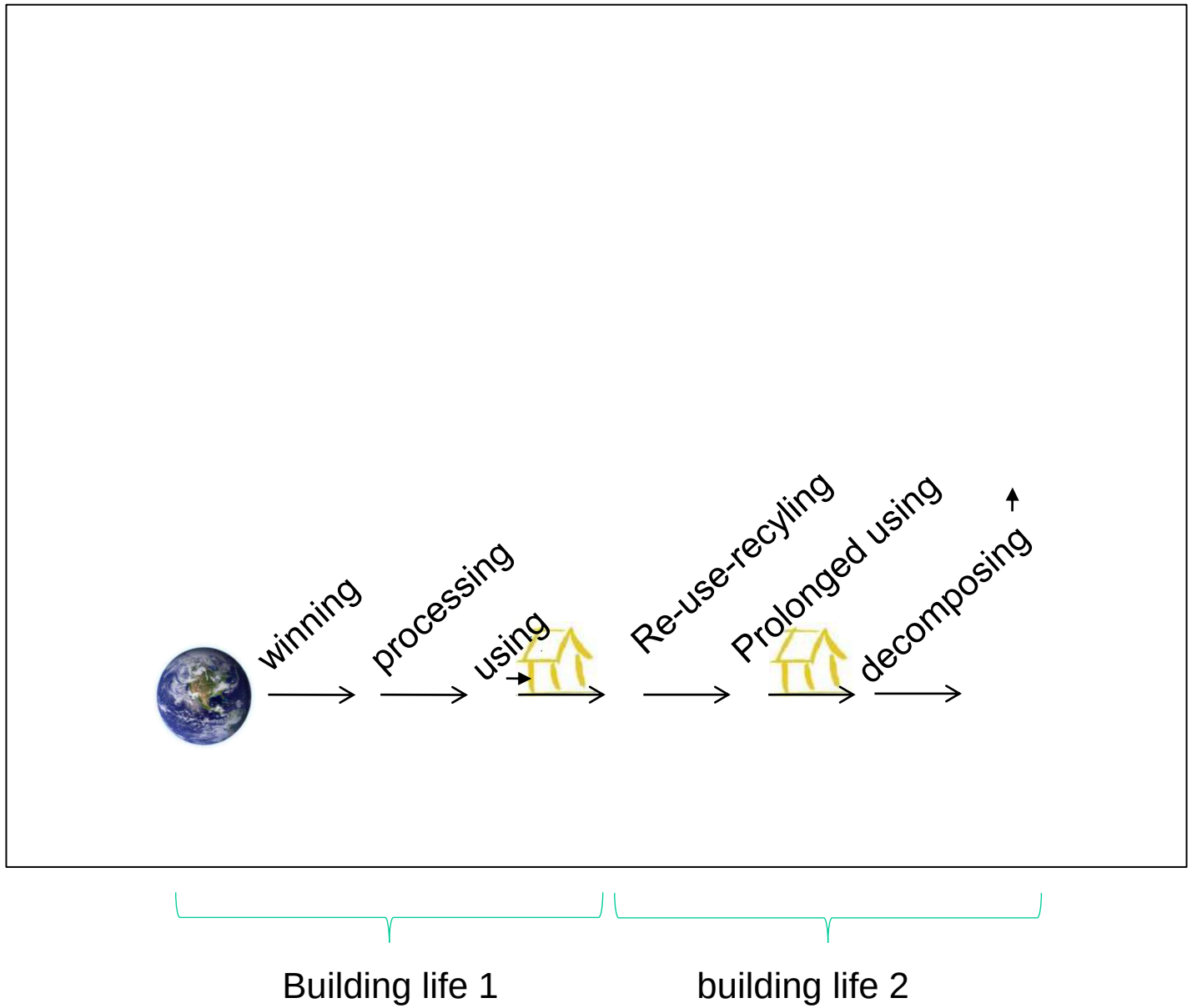
Post Fossil!

The resource cycle

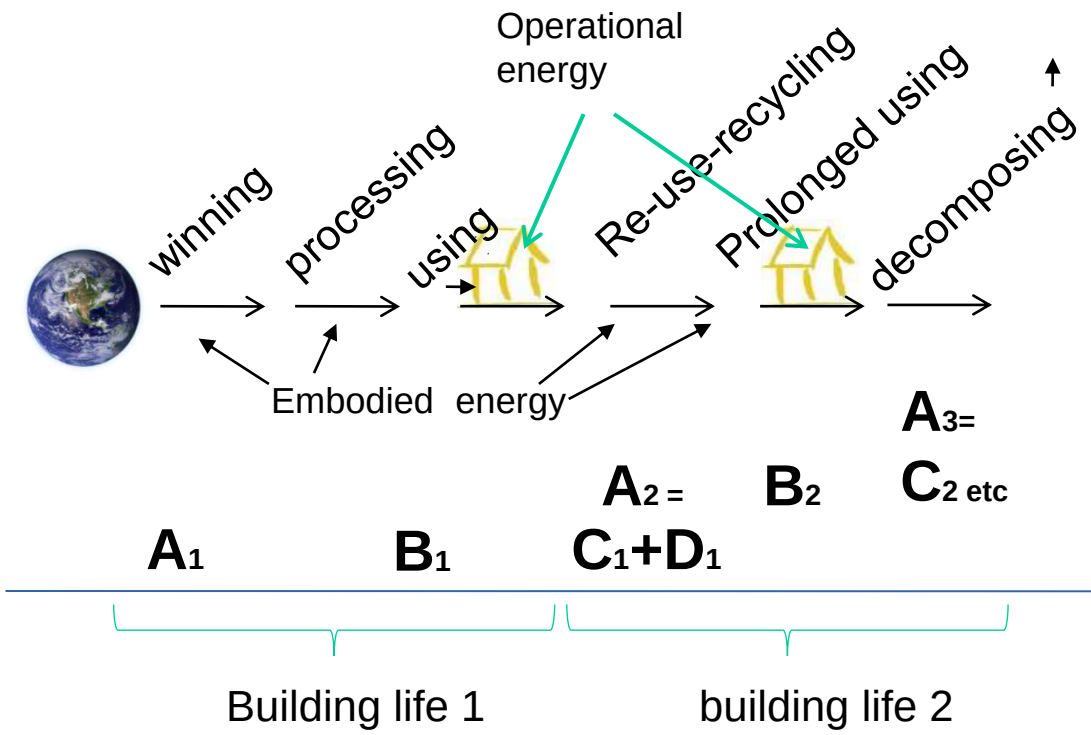


Building life 1

The resource cycle

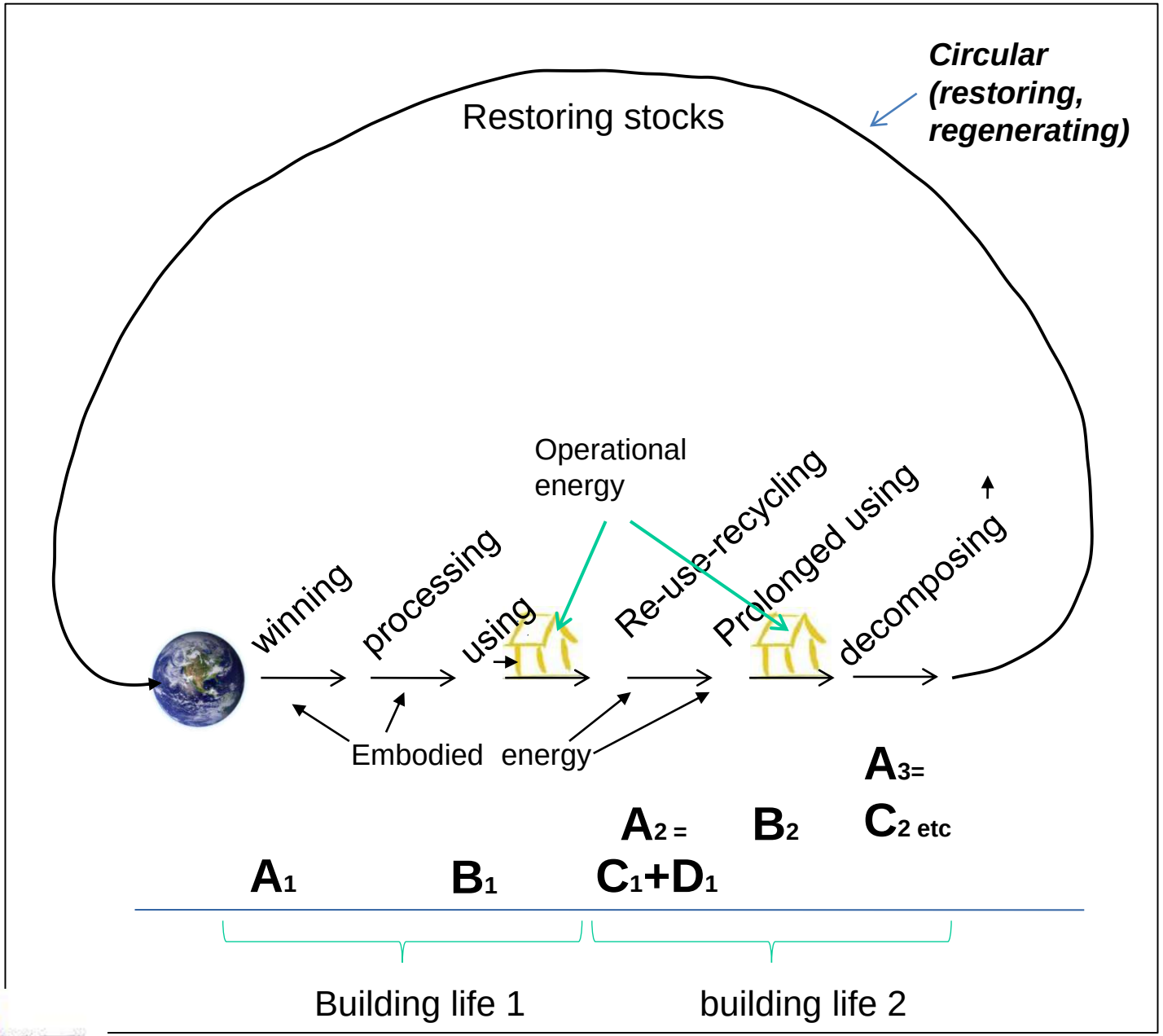


The resource cycle



Linear delaying -reducing speed and volume)

The resource cycle



Linear delaying -reducing speed and volume)

New buildings

Leading to 3 conditions:
1- regrowable (biobased) and streaming resources

2 - a building should last longer as the resources need to regrow/restore.

3 – House should in any case last much longer as 50 years-eternal.

growth is only possible if future generations profit from previous invested resources. A generation is 50 years (~20-70 years): when a newborn does not need to invest in a new house, but can profit from an existing one.

Implying also:
4 Installation poor design, and even without heating.

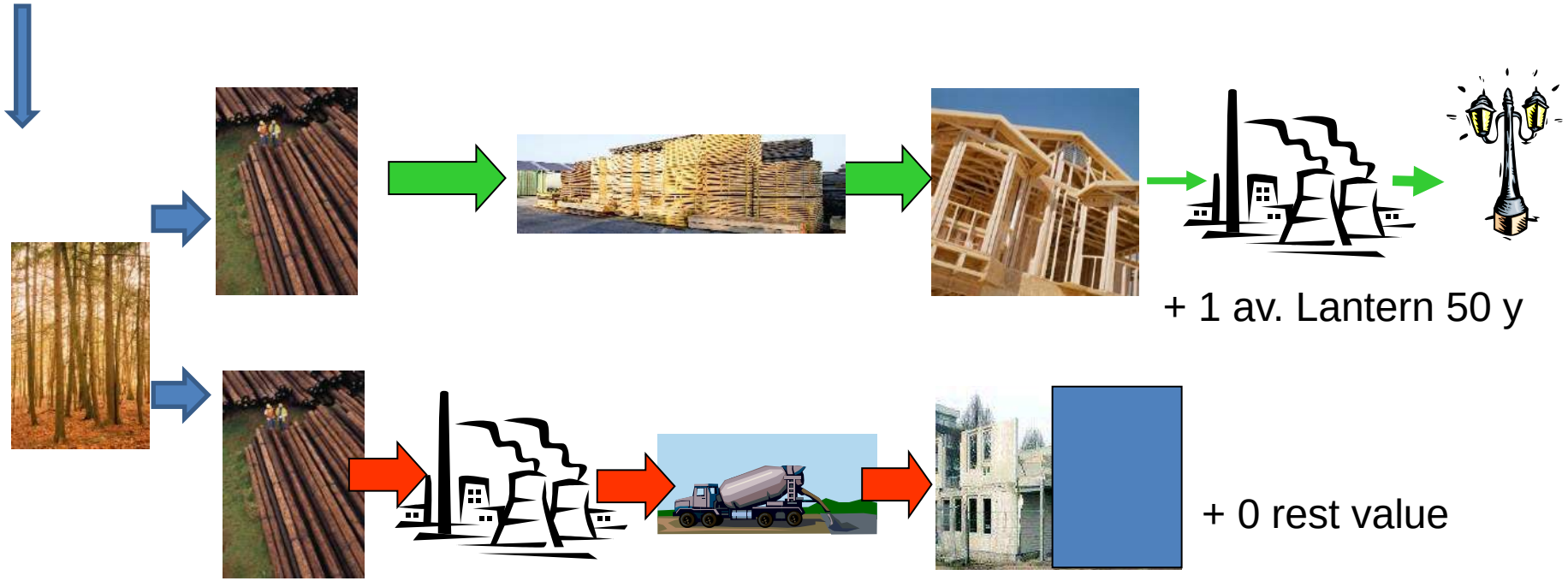
5 Built only along existing roads! :
(infrastructure investment impact is as high as building, per m2)

Post Fossil:

compare concrete with wood

15m3 =

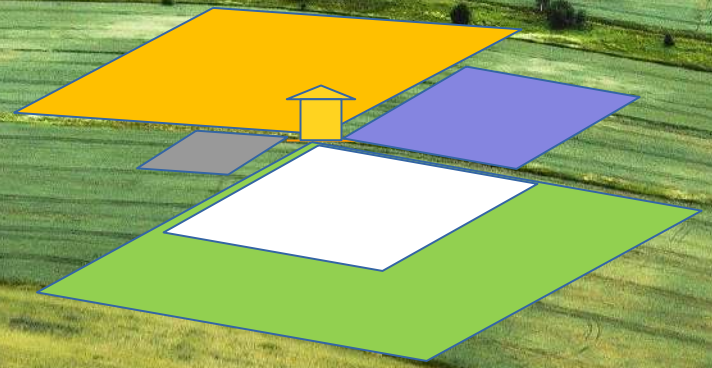
3ha-year yield



+ 1 av. Lantern 50 y

+ 0 rest value

‘ Embodied Land’



House 100 m2
100% Biobased

Material: 1600 m2 50y basis

Food: 3000/1000 m2
(closed cyle agro)

Energy 23 m2/3000m2 (PV incl CE)

Water 100 m2

RiBuilT
THE CONCEPT OF ZERO

Biobased (Vegetarian) building

Eerste prijs ‘Ballast Nedam natuurhuis’: Strotec

- Natuurhuis van stro
- Energiepositief (+26%)
- 96% biobased
- 90 ton CO2-opslag
- 50 ton CO2-verdringing

https://youtu.be/RgOZ-uHFB1I

Installation-poor building

Office and houses in Austria without heating installation ‘2226’ , Baumschleger-Eberle

Existing stock:

1 Never demolish anything anymore. (unless dangerous)

2 reduce heated area. (less energy, less materials, living with the seasons)

3 apply targeted measures, biobased….!
Whole make over is not optimal, from energy and materials use impact, but also not from stock management.

4 split houses, living smaller.

5 Minimal installations

Change how we evaluate buildings…:

Some lessons I took from recent research and work in IEA Annex: A72:

– focus on embodied energy (embodied land), not CO2 for optimisation

– forget EOL, impact is now. Mainly from Embodied energy.

– measure absolute impact today, not reductions and not LCA

– recycling is not impact free… Only if materials have been restored/regenerated

- system border to evaluate should include infrastructure and energy supply system.

– (more) new technologies only possible with more fossil/CO2

Its

land-**time of resources:**

How much resources can the earth-solar-biomass system deliver
per unit of time and land?

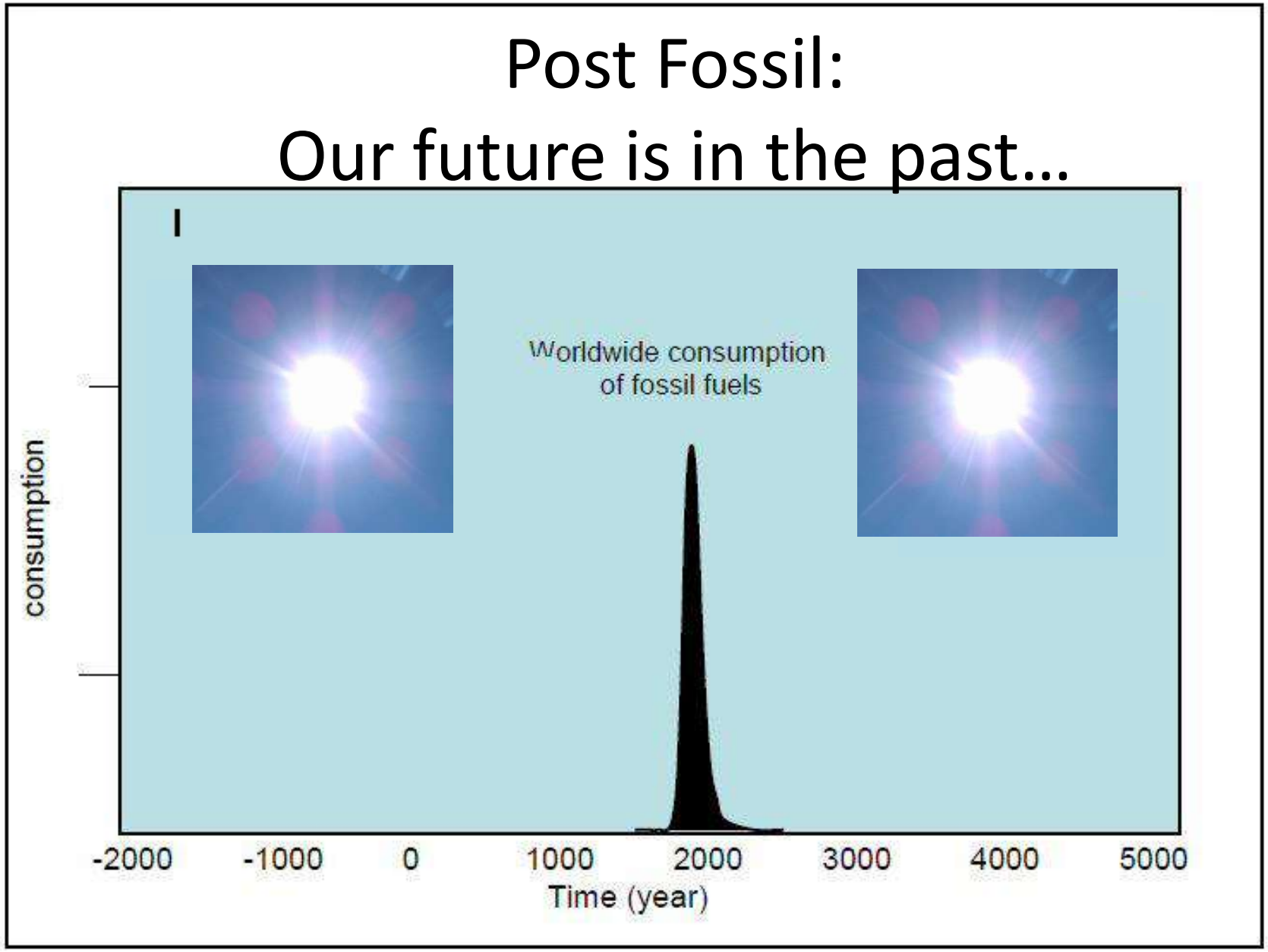
That Land is our capital and main converter.

In a Post Fossil world.

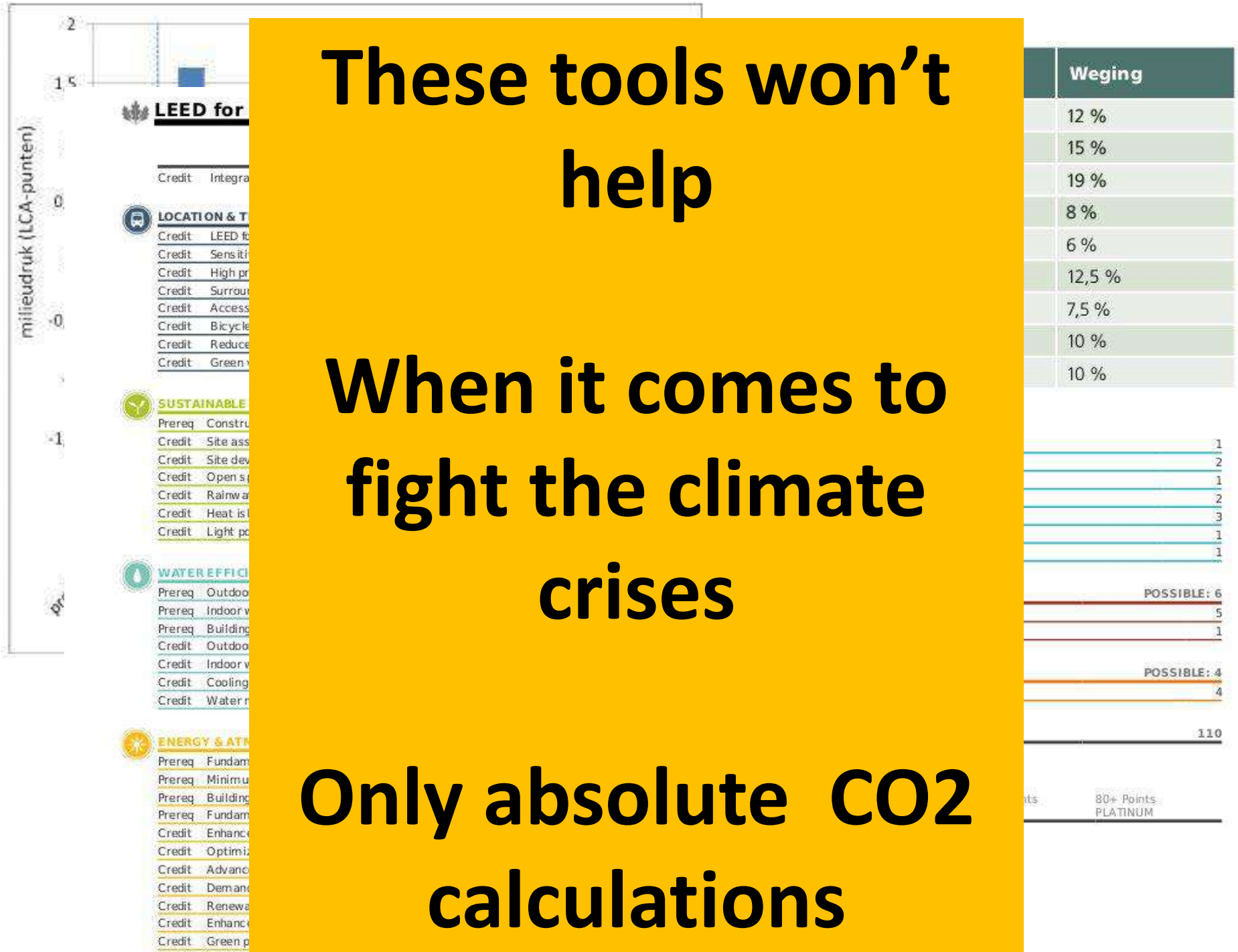
CO2 lockdown?

Not if, but when!

Post Fossil:
Our future is in the past…



Courtesy J.Kimman/R.Rovers



These tools won't help

When it comes to fight the climate crises

Only absolute CO2 calculations

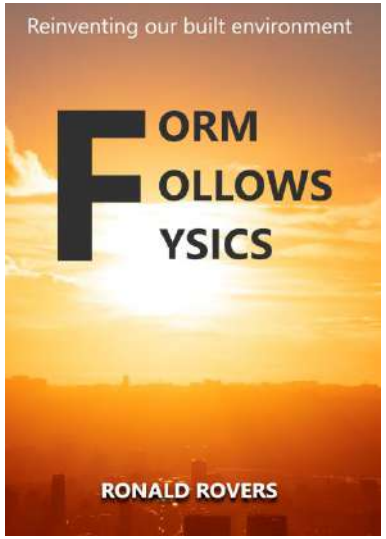
Energy neutral: operational energy OE

Climate neutral: OE + embodied energy OE + EE

System neutral: OE+ EE + material depletion (CE)

Energy and materials are always related and combined :

- More materials = more energy, and
- restoring material stocks require energy (CE)



Just a few consequences:

Minimise new construction
No more high rise
No more aluminium, and phase out steel and concrete
Reduce living space per capita
Avoid energy demand as much as possible
Use only biobased materials
Only 1-way roads, and semi-paved if possible

Reinvent buildings (and lifestyles !)


‘2226’ office, Bregenz Austria
Installation-poor building

CO2, ok. But then: what about resources?

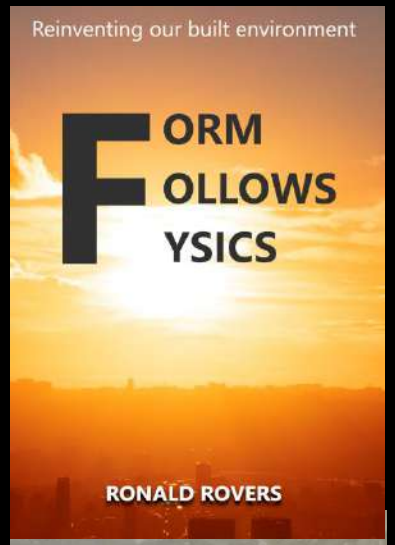
Circular building ?

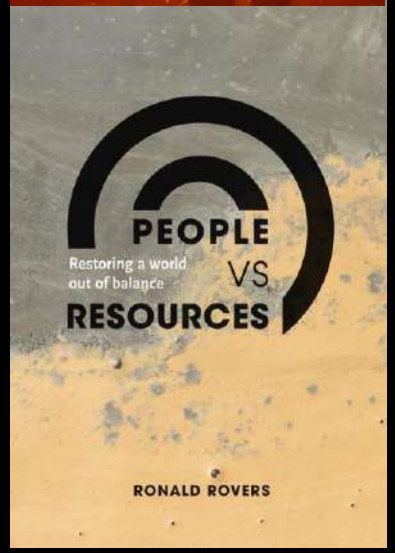
Is only half the story ….

resource discrimination

The circular economy movement is trying to institutionalize this approach. But its misleading

Research Institute Built Environment of Tomorrow





The richer the people, the poorer the Earth

Thanks for your interest!

Ronald Rovers,
Director SBS centre / RiBuilT
Fellow Professor TUE fac Built Environment

Masterclasses, research, guestlecturing, workshops

Blog: www.ronaldrovers.com , office: www.ribuilt.eu

EU funding opportunities - Contributing to a sustainable built environment

Drive 0 Final event

Ana Sin Bagüés
Project Adviser, LIFE Energy & Climate,
CINEA – Climate Infrastructure and Environment Executive Agency

Renovating buildings for greener lifestyles

Buildings account for:

40%

of energy consumed

36%

of energy-related greenhouse gas emissions

- Renovation is key for **reducing the energy consumption** of buildings, for bringing down emissions and for reducing energy bills. In addition, renovation **generates employment** and economic growth.
- The **Renovation Wave** strategy aims to double the annual energy renovation rate by 2030 and to foster deep energy renovations. 35 million buildings renovated.
- Revision of the **Energy Performance of Buildings Directive** to reflect the higher ambitions and more pressing needs in climate and social action.

European Commission

CINEA

European Climate, Infrastructure and Environment Executive Agency

CONNECTING EUROPE FACILITY 2
Transport and Energy

INNOVATION FUND

HORIZON EUROPE
Climate, Energy and Mobility

LIFE PROGRAMME

LIFE
Clean Energy Transition

JUST TRANSITION MECHANISM
Public Sector Loan Facility pillar

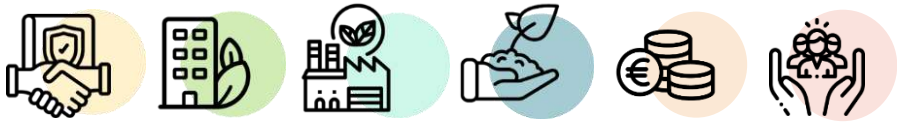
RENEWABLE ENERGY FINANCING MECHANISM

EUROPEAN MARITIME FISHERIES AND AQUACULTURE FUND

European Commission

LIFE Clean Energy Transition

- Direct support for the implementation of EU energy policies and legislation…
  - Create market and regulatory enabling conditions for the clean energy transition
  - Improve governance and capacities/skills at all levels
  - Mobilise investments and improve access to finance
  - Develop and replicate best practices
- Defined main intervention areas…



  - Annual calls for proposals (opening ≈ spring)
  - 95% co-funding
  - Projects indicative budget ≈ 1.5 - 2 € million
  - Consortia: Most topics minimum 3 eligible countries, some topics national/regional focus

https://cinea.ec.europa.eu/life/clean-energy-transition_en

European Commission

LIFE Clean Energy Transition (CET)
Sustainability in buildings – Funding areas examples

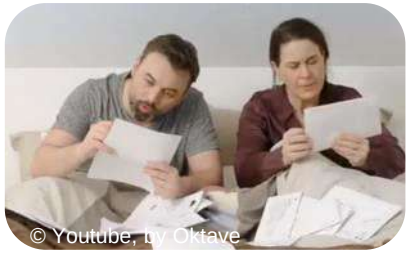
Deep renovation (NZEB, ZEB)

Data and tools

Smart buildings and services

Build Up Skills

Project development assistance



Support services for renovation

Consumers

Policy implementation

European Commission

LIFE Clean Energy Transition (CET)
Sustainability in buildings

BUILD UP

- The European portal for energy efficiency and renewable energy in buildings
- A repository of tools, and a source of updates and news
- Disseminate project results!

https://build-up.ec.europa.eu/en/home

EU Building Stock Observatory

- The European repository for data and information on the EU building stock
- Key data and indicators, infographics, data mapper, country reports

https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/eu-building-stock-observatory_en

European Commission

Horizon Europe – Cluster 5

- HORIZON-CL5-2024-D4-01-01: Low-disruptive renovation processes using integration of prefabricated solutions for energy-efficient buildings (18 April 2024)

18 April 2024

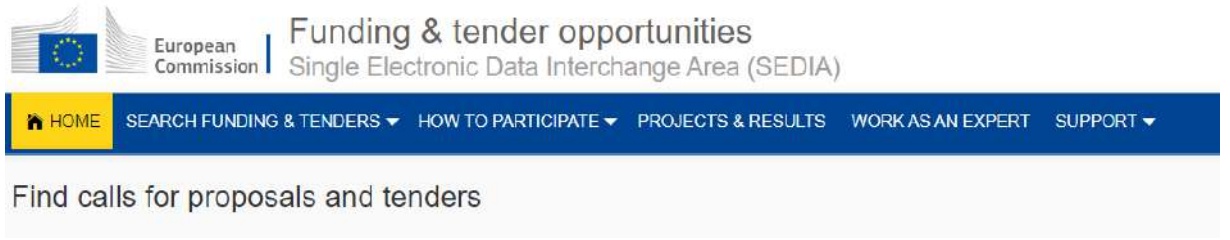
- HORIZON-CL5-2024-D4-02-01: Industrialisation of sustainable and circular deep renovation workflows
- HORIZON-CL5-2024-D4-02-03: BIM-based processes and digital twins for facilitating and optimising circular energy renovation.
- HORIZON-CL5-2024-D4-02-04: Design for adaptability, re-use and deconstruction of buildings, in line with the principles of circular economy.

Built4People Partnership, 21 January 2025

European Commission

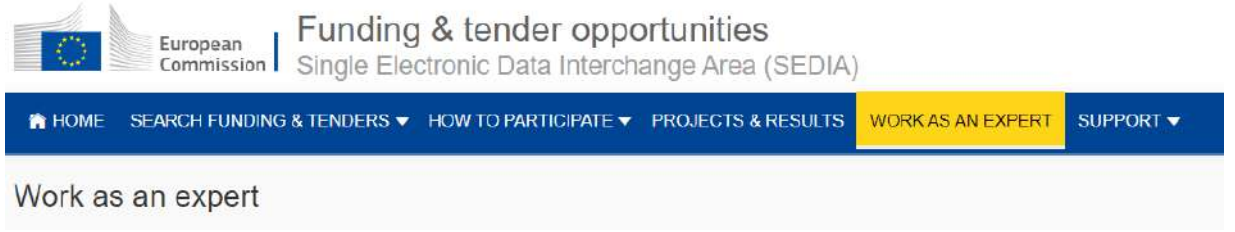
For more information…

Funding and tender opportunities portal



CINEA's programmes, projects, events

Not applying? Register in the experts' data base!



European Commission

Thank you

Ana Sin Bagüés ana.sin-bagues@ec.europa.eu

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CINEA - European Climate, Infrastructure and Environment Executive Agency

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LIFE Programme:

European Commission

The built environment sector is ripe for a radical change.

EU: The European Green Deal & Renovation Wave

European Committee of the Regions

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StepUP

PLURAL

INFINITE BUILDINGRENOVATION

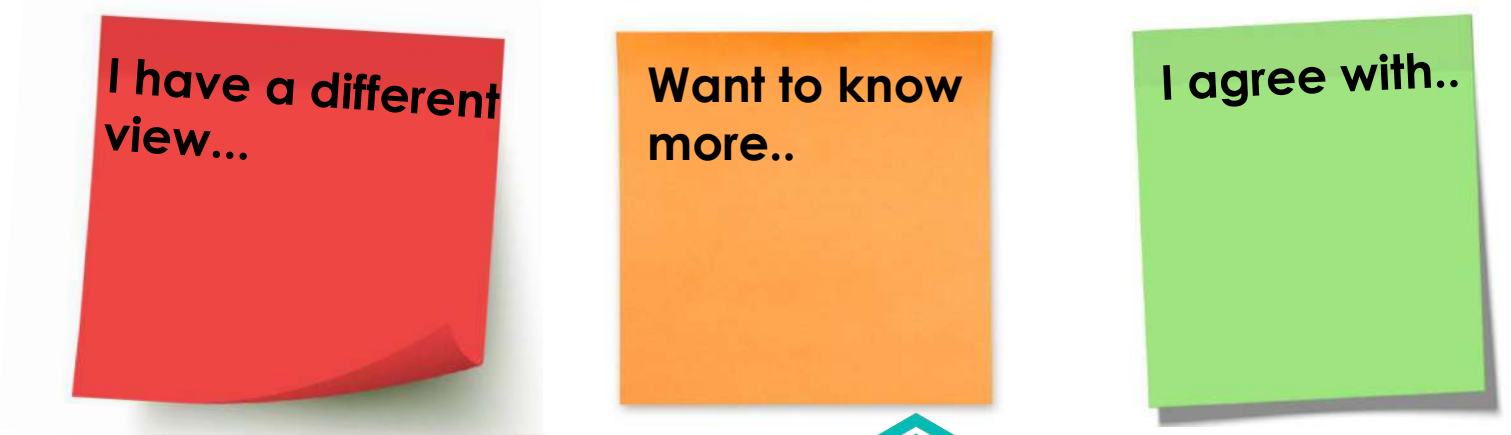
BuildUPspeed

giga regio factory by energie sprong

Projects in the spotlight

Featuring:

- Ana Tisov - **Drive 0** (H2020) - Accelerating deep renovation processes through the design of a consumer-centred circular renovation strategies and solutions
- Melinda Orova - **STEP-UP** (H2020) - Making decarbonization of buildings a reliable, attractive investment
- Maria Founti - **PLURAL** (H2020) - Plug-and-use renovation with adaptable lightweight systems
- Jure Vetršelk - **INFINITE** (H2020) - Industrialized durable building envelope retrofitting by all-in-one interconnected technology solutions
- Maria Sara di Maggio – **BuildUPspeed** (LIFE) - Promoting & implementing industrialized renovation solutions
- Sebastien Delpont - **Giga Regio Factory** (LIFE) - Market uptake and factory development for more affordable Net Zero-Energy renovations through industrialized solution packages



European Committee of the Regions

Coffee break and exhibition

'Projects in the spotlight'

See you back in 30 minutes

Drive 0 Final Symposium and EU Clustering Workshop

2nd session:

Experiences from the projects to revolutionise construction

Drive 0 Final Symposium and EU Clustering Workshop

H2020 DRIVE 0:

Driving decarbonization of the EU building stock by enhancing a consumer centred and locally based circular renovation process

A closer look at technological advancements in sustainable construction

John van Oorschot, dr., ZUYD

About industrialization in construction & renovation

- Industrial (house)building aims at raising efficiency, customization and sustainability by rationalizing the construction process through the adoption of production technologies and methods found in highly industrialized mass-production industries

- **Industrial housing system (IHS):** the application of mass-customization principles to construct or renovate housing

- IHS involve on- and off-site production methodologies within a controlled environment, and delivered through a well-coordinated integrated system

Van Oorschot, J. A. W. H., Halman, J. I. M., & Hofman, E. (2019). The continued adoption of housing systems in the Netherlands: A multiple case study. *J. Constr. Eng. Manag. Innov*, *2*, 167-190.

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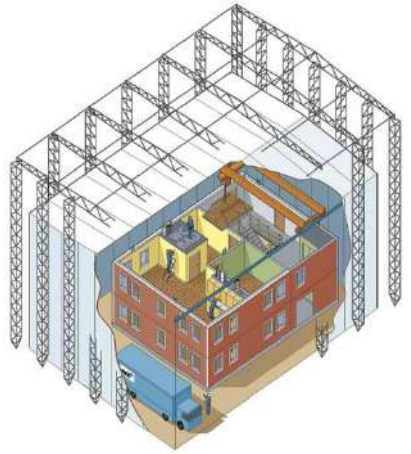
About industrialization in construction

However,

Despite the reported benefits, many industrial housing systems are hardly applied beyond their demonstration status across a range of subsequent projects: **the history of IB is rich in examples of failures**



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Source: http://www.ncc.se; husfa468.jpg (468×527) (wordpress.com)

About industrialization in construction

About industrialization in construction

stroom versnelling

DRIVE

About industrialization in construction

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About industrialization in construction

Establishing a successful IHS:

1. The first stage: A process of **product & process standardization**
   - A Project-Independent Coalition with Preferred Subcontractors and Suppliers
   - A Standardized Development and Production Process
   - A Stable Production Team in Terms of Composition and Members
   - A Well-Considered Balance between Regionally and Centrally Directed Activities

2. The second stage: **Standardized variety**
3. The third stage: **Differentiation**
4. The fourth stage: **Service orientation**

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Van Oorschot, J. A. W. H., Halman, J. I. M., & Hofman, E. (2019). The continued adoption of housing systems in the Netherlands: A multiple case study. *J. Constr. Eng. Manag. Innov*, *2*, 167-190.

About industrialization in construction

Preconditions to establish a successful IHS:

1. **Evolutionary** process (in contrast to revolutionary!) to establish both market and industry maturity → from a focus on standardization, to standardized variety, to differentiation, towards the inclusion of a service orientation.
2. Adherence to the principles of a **territorial (local) economy**
3. **Coherent organization and management** of the successive stages in a housebuilding process: a well-coordinated planning and control is needed that integrates the interrelated processes of design, manufacturing, (on-site) assembly and other related processes such as procurement, sales and marketing
4. Importance of maintaining a **cost leadership** position in the market and to keep pace with **changing market** requirements by further improving and developing the existing housing system

Van Oorschot, J. A. W. H., Halman, J. I. M., & Hofman, E. (2019). The continued adoption of housing systems in the Netherlands: A multiple case study. *J. Constr. Eng. Manag. Innov*, *2*, 167-190.

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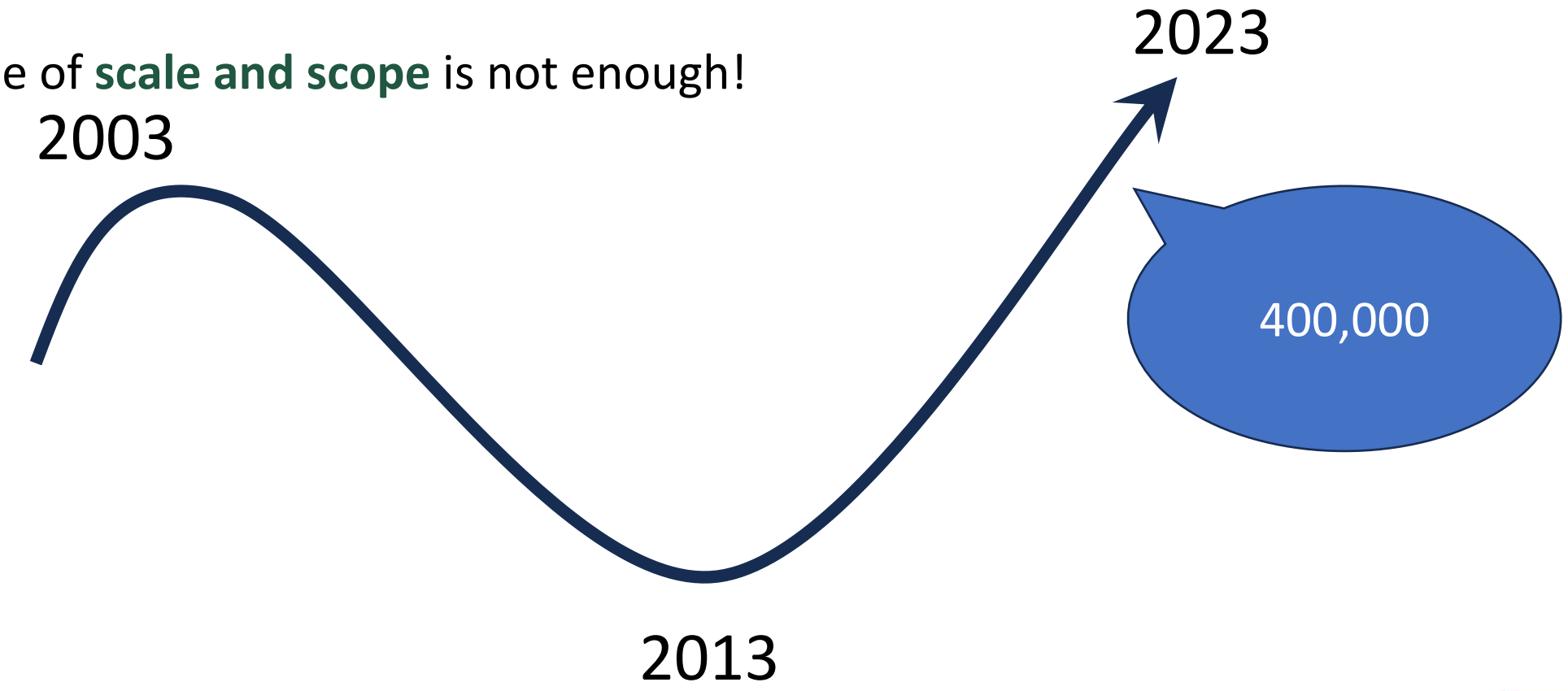
About industrialization in construction

The promise of **scale and scope** is not enough!



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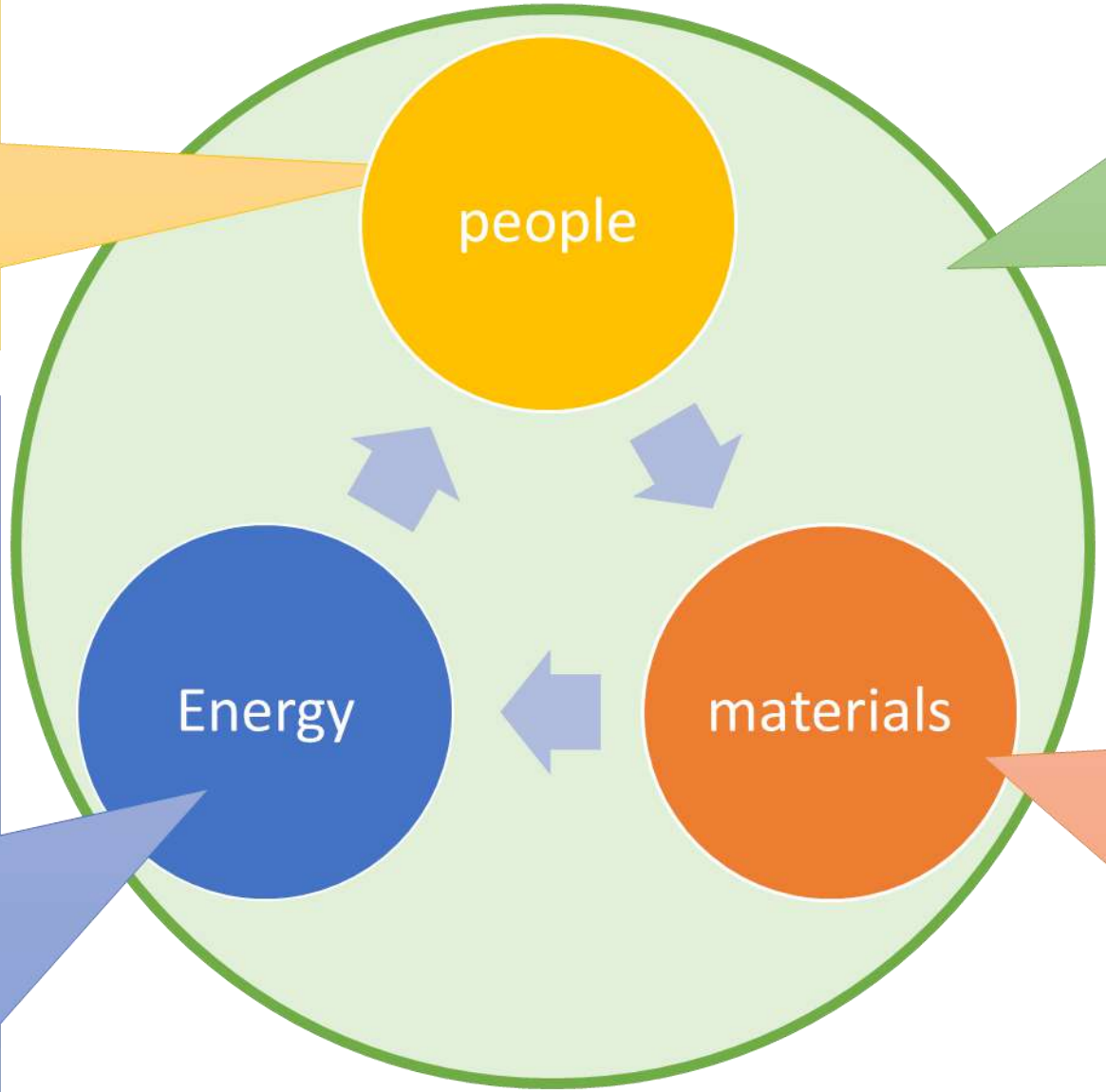
Mapping local drivers

Built4People
- Map stakeholders
- Map building (quality) characteristics relative to building typology (replicability)
- Identify experiences, needs and wishes of residents & other stakeholders

Macro conditions
Map macro-characteristics
- Demografic
- Economic
- Social-cultural
- Technological
- Ecological
- Political-legal



Energy
- Map current dominating energy system
- Map current energy efficiency of dwellings and other relevant buildings
- Map amount of people who experience energy poverty in the neighborhood
- Collect energy bills (when possible)
- Map potential for local renewable energy sources

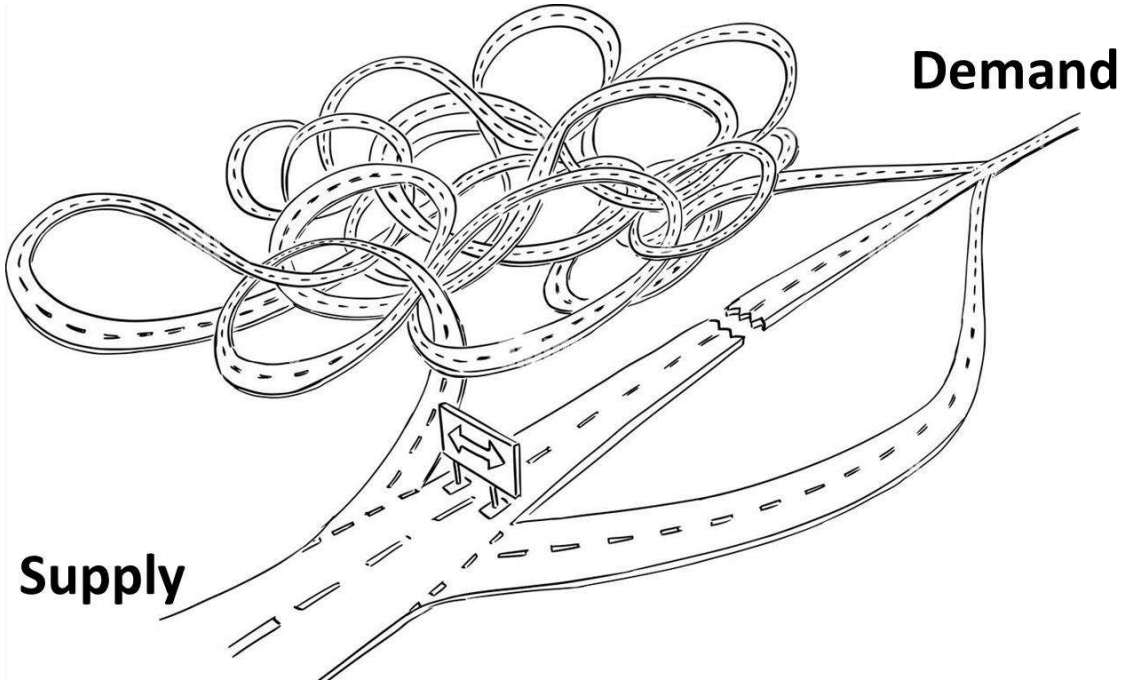
Materials
- Circular and biobased construction technologies including RES
- Local demolition sites
- Current building materials stocked in existing buildings
- Residual (waste)material from local industry
- Local recycling Initiatives

About industrialization in construction

Industrialization & deep-renovation

Local pop-up factory concept

A factory in the district itself for the time of the district retrofitting program. The factory will produce and assemble industrialized prefab building components that will be installed in the deep-renovation projects.



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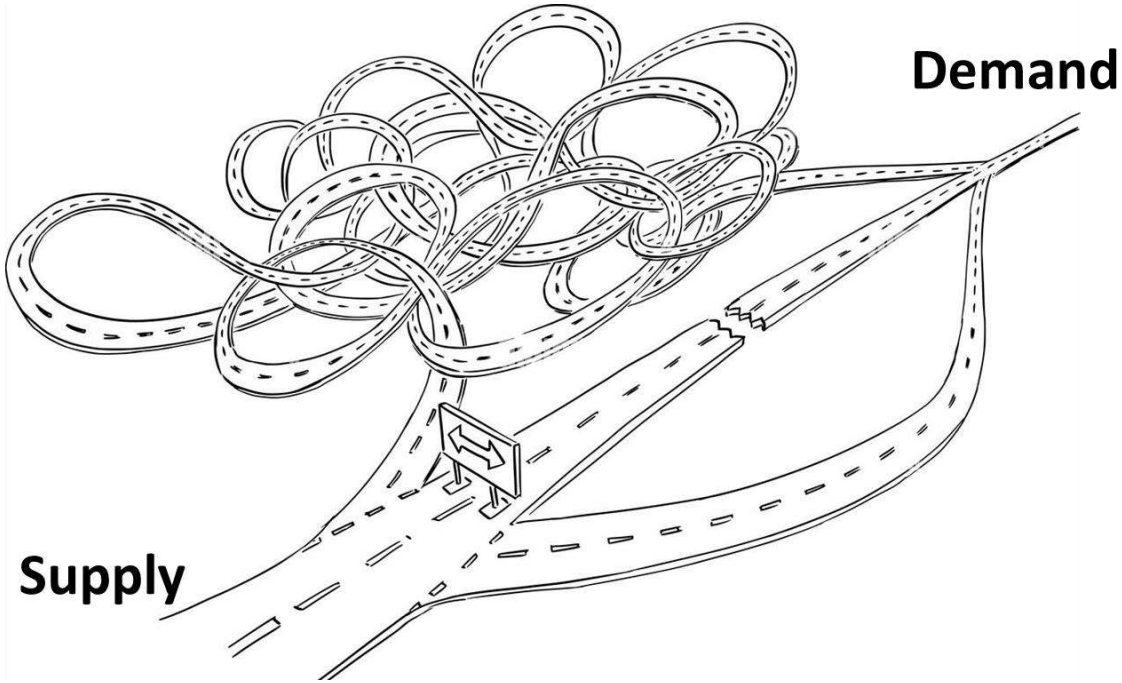
About industrialization in construction

Industrialization & deep-renovation

Local pop-up factory concept

- Implementation and the success of this concept highly depends on the **maturity** and the **readiness** of the local or even national markets.
- The implementation can differ in **a wide range, from pop-up services to fully operational pop-up factories**.



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About industrialization in construction

Factory scenario	Mobile on-site factory	Satelite factory	District factory	Assembly factory	Service factory
Value case	Temporary mobile production facility suitable for situations with long distances as well as a many transports or high quantities of materials to be shipped from and to the construction site.	A temporary set-up of a central production facility providing specialized knowledge, skills and equipment to small scale local production facilities or construction SMEs operating at large geographical proximity	'System integrator' bringing together stakeholders who are not accustomed to working together in a coordinated way across multiple projects within a particular geographic area or district.	The assembly factory is oriented on assembly and service provision of standardized semi-finished deep-renovation components manufactured off-site at different geographical locations.	The service factory acts as an intermediary between homeowners and suppliers of deep-renovation technologies, providing access to local communities for suppliers to sell their products and services.
Readiness pre-conditions	□ Long transport distances to remote locations □ Multiple transports □ High quantities of materials □ Involves site based deep-renovation technology	□ Geographical dispersed and remote districts with limit access to specialized knowledge, skills and equipment	□ Sufficient scale and scope within a particular geographic area □ Local supply chain set-up tuned to specific local market needs	□ Availability of standardized deep-renovation products; interfaces and processes oriented on specific building typologies □ Stable and dedicated assembly and service teams	□ Service, one-stop-shop approach oriented on individual homeowners □ Locally present with local deep-renovation products and services available 'at the shop'

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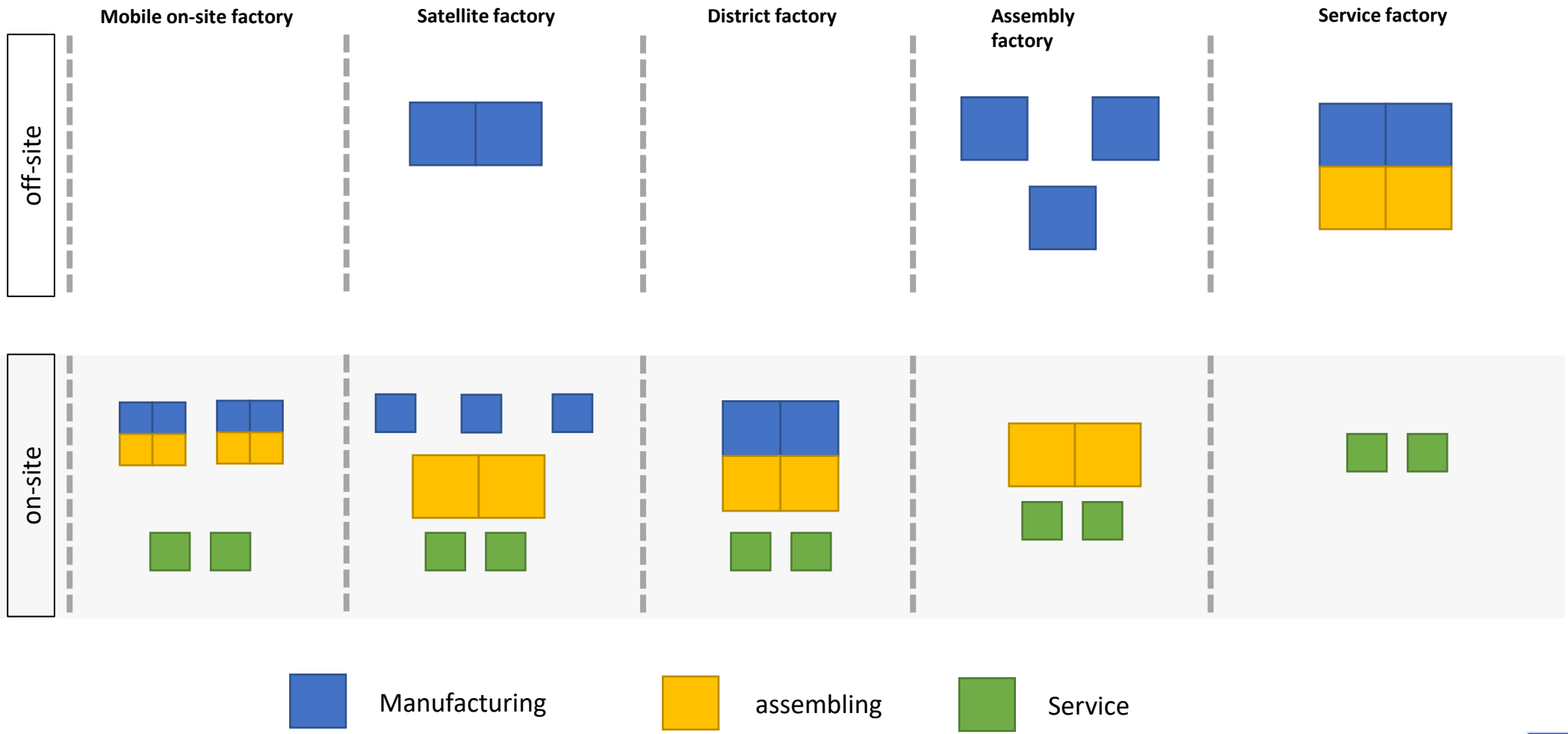
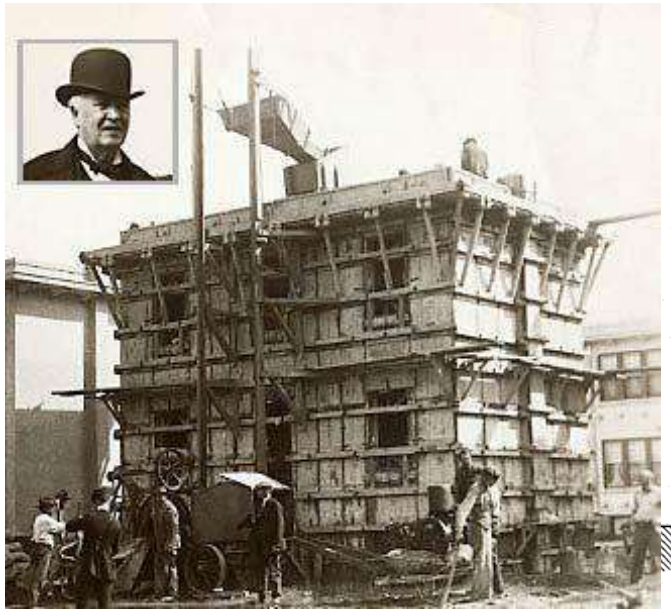
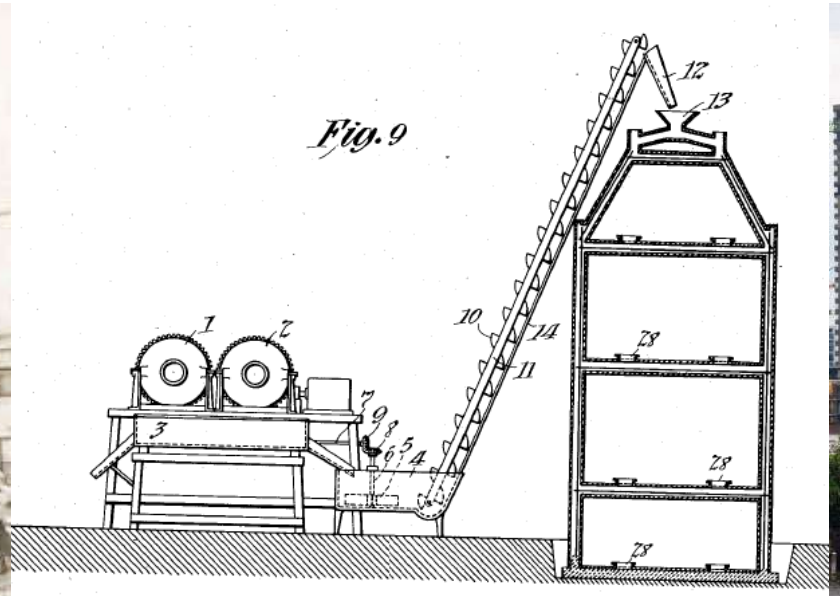
About industrialization in construction



1) Mobile on-site factory

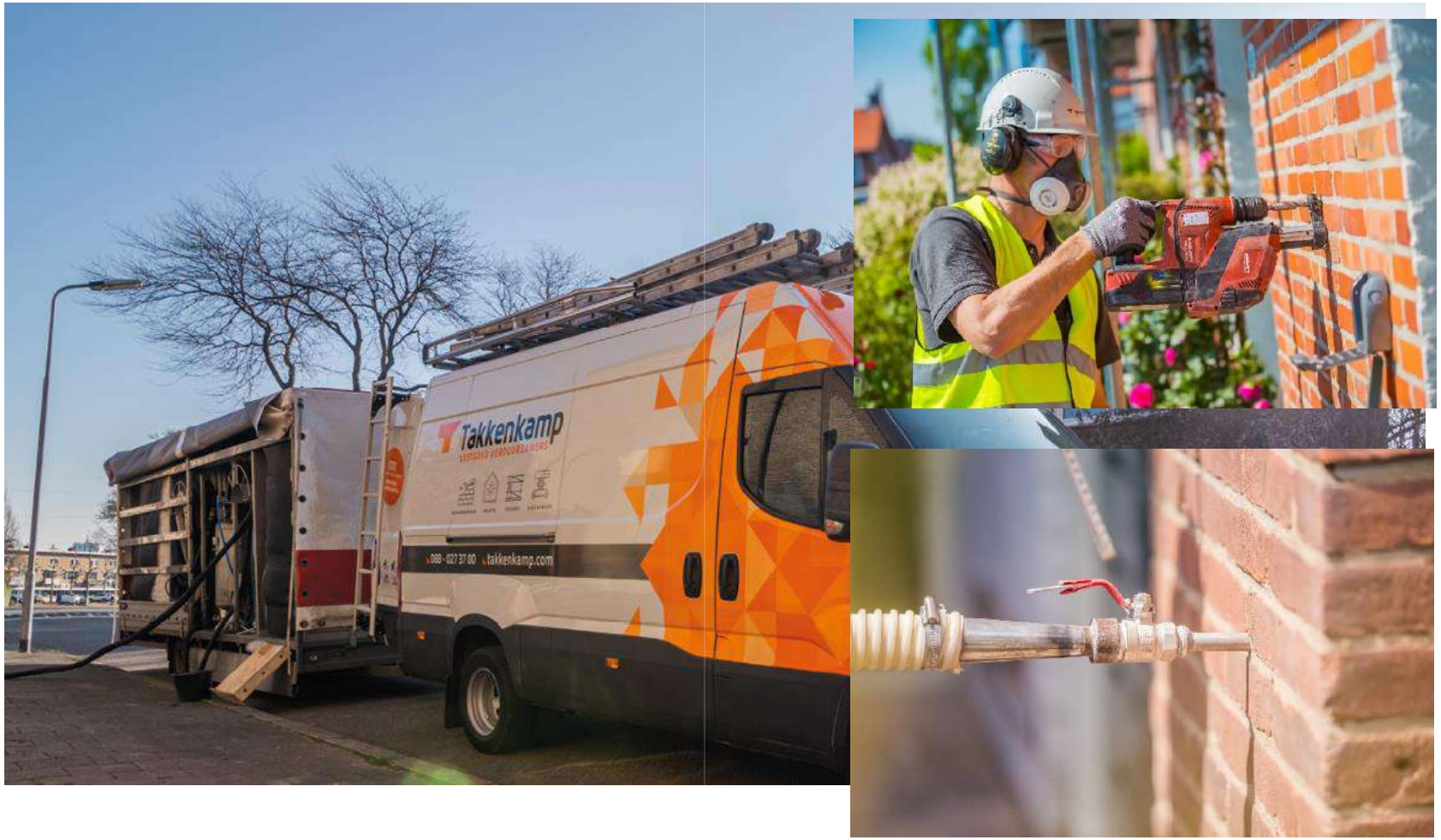
- T.A. Edison's patent voor een *'process of constructing concrete buildings'* (1917)



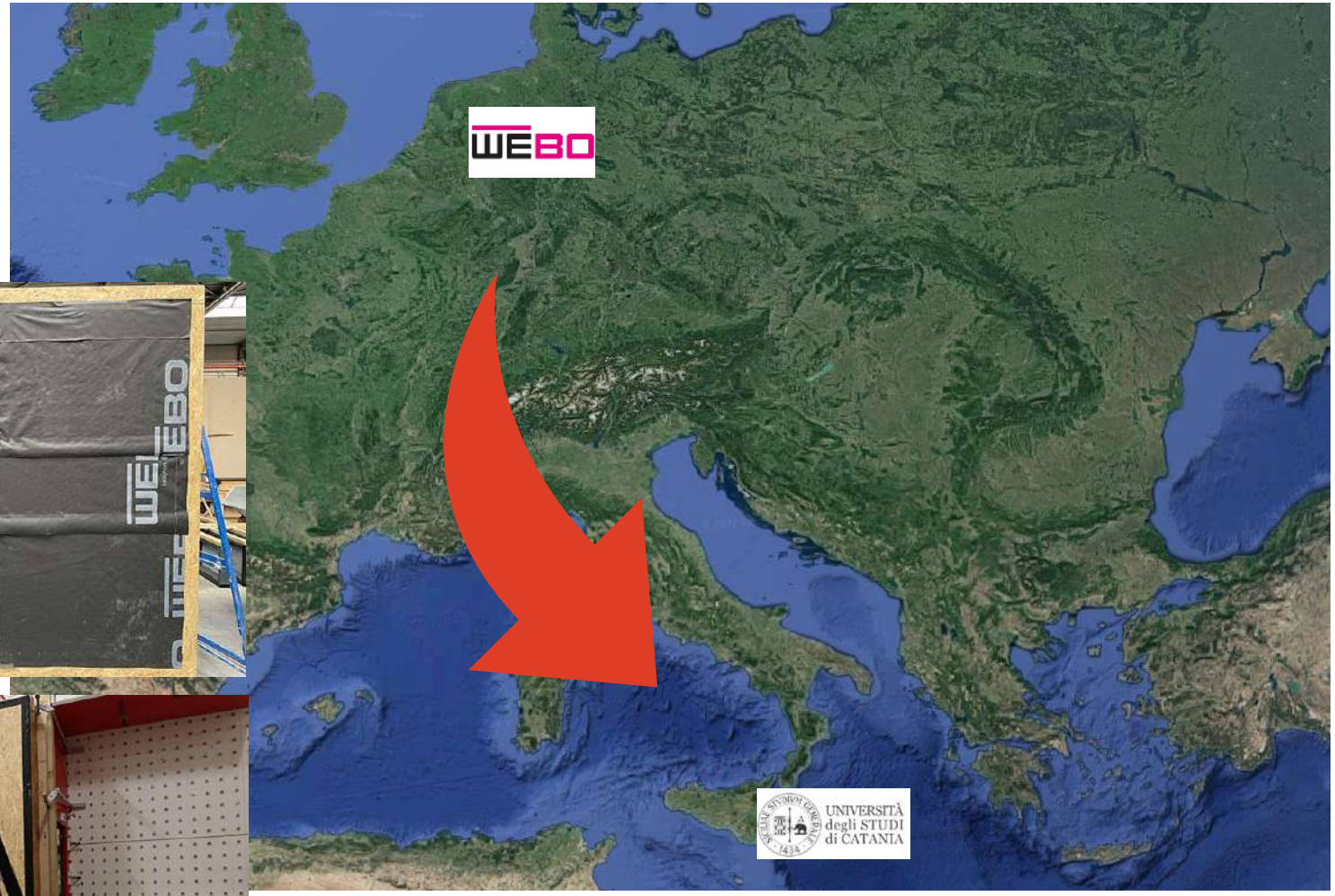


Source: [Edison Has Concrete Ideas About Listening To Music | 100 Years Ago Today (wordpress.com)]

1) Mobile on-site factory



2) Satelite factory



e-SAFE

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3) Assembly factory

https://www.zuid.ballast-nedam.nl/projecten/t-ven/
https://www.eib.nl/pdf/de_stroomversnelling.pdf

stroom versnelling

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4) District factory

Openings

Roof

Facade

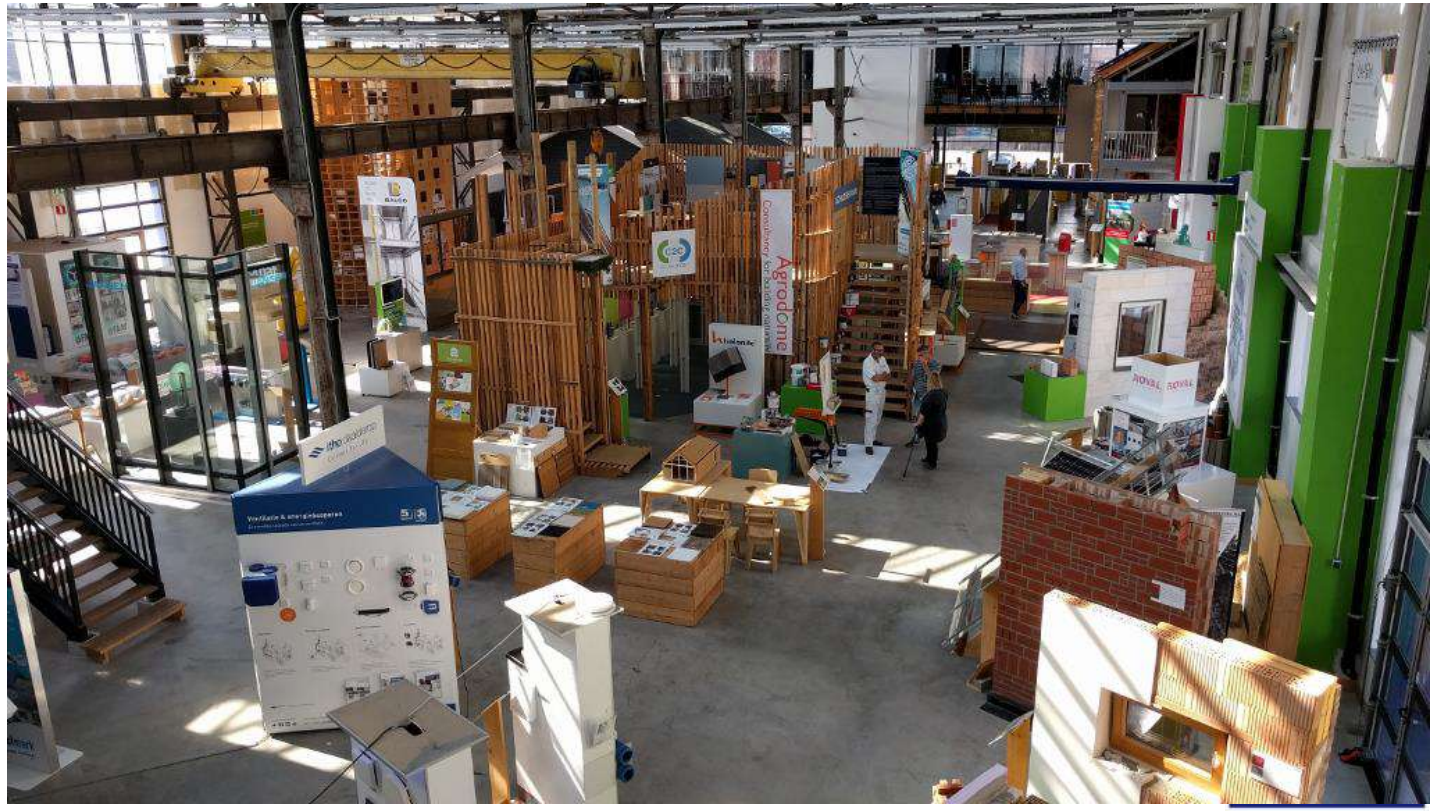
Roof & facade

Mass-customization

DRIVE

5) Service factory: woonwijzerwinkel.nl

- Collective purchase (Solar technology; insulation)
- Building scan
- Energy coach
- Demonstration
- Intermedian activities



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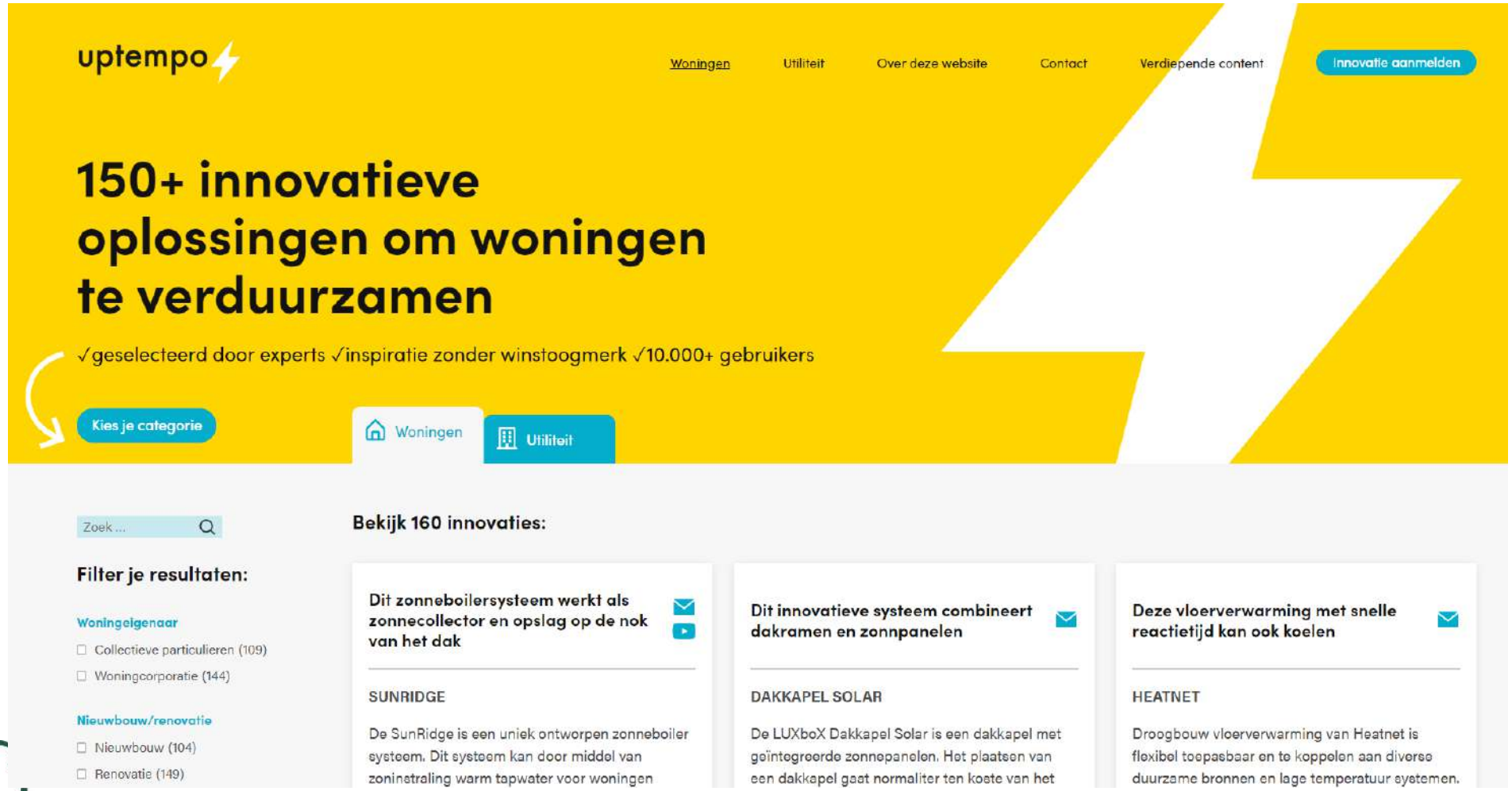
5) Service factory: uptempo.nl



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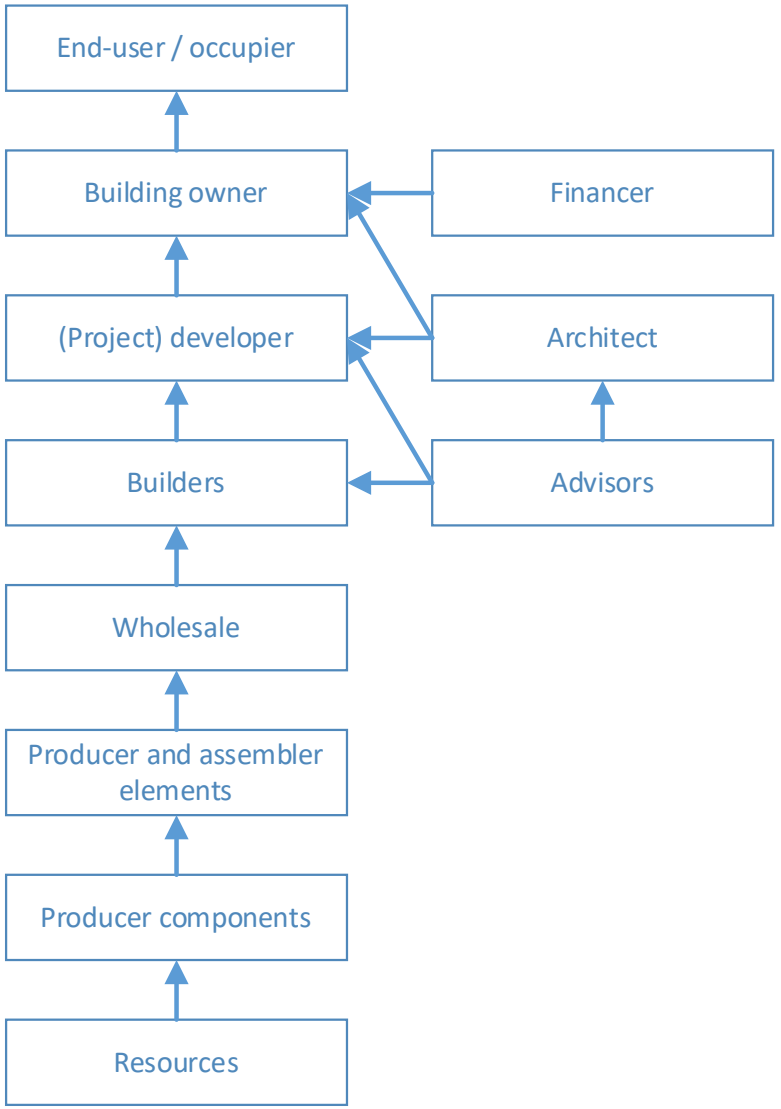
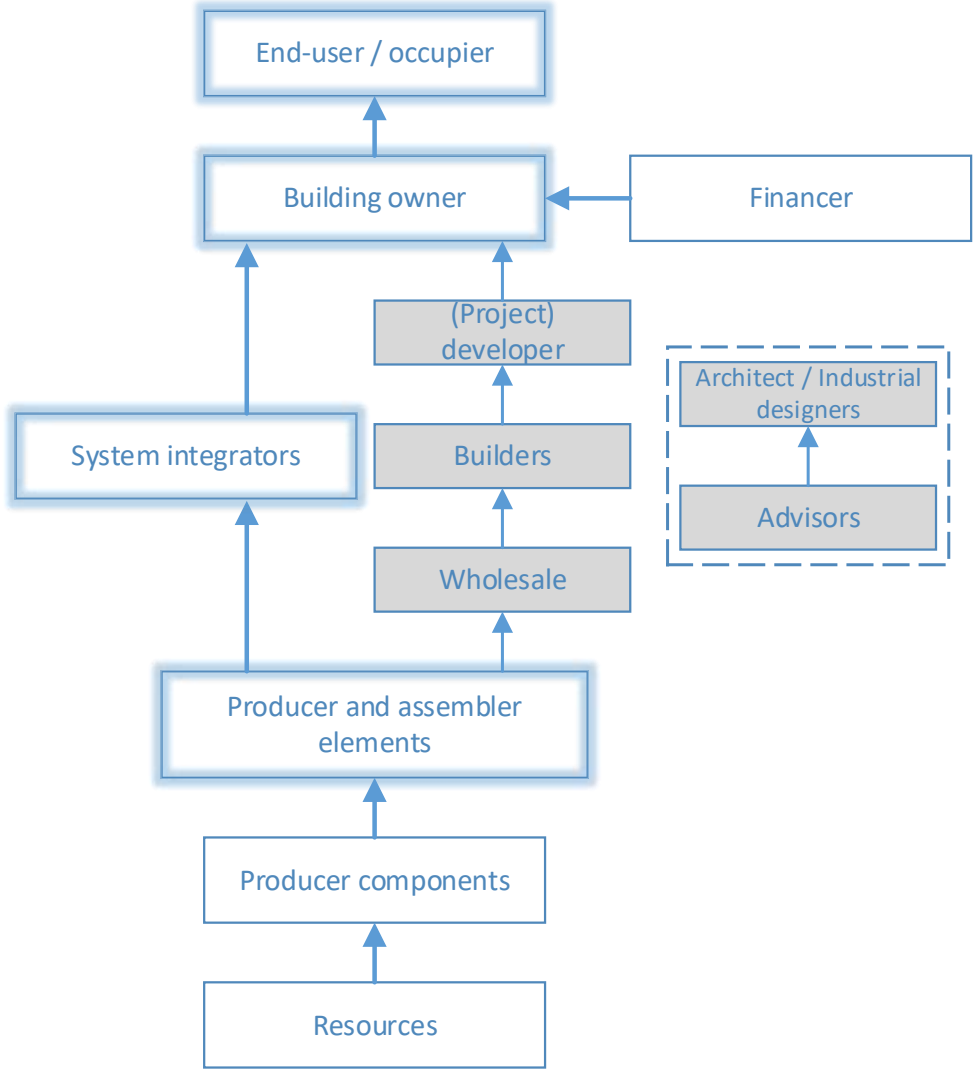
Traditional Supply Chain Set-up



Impact of modularity on the traditional supply chain



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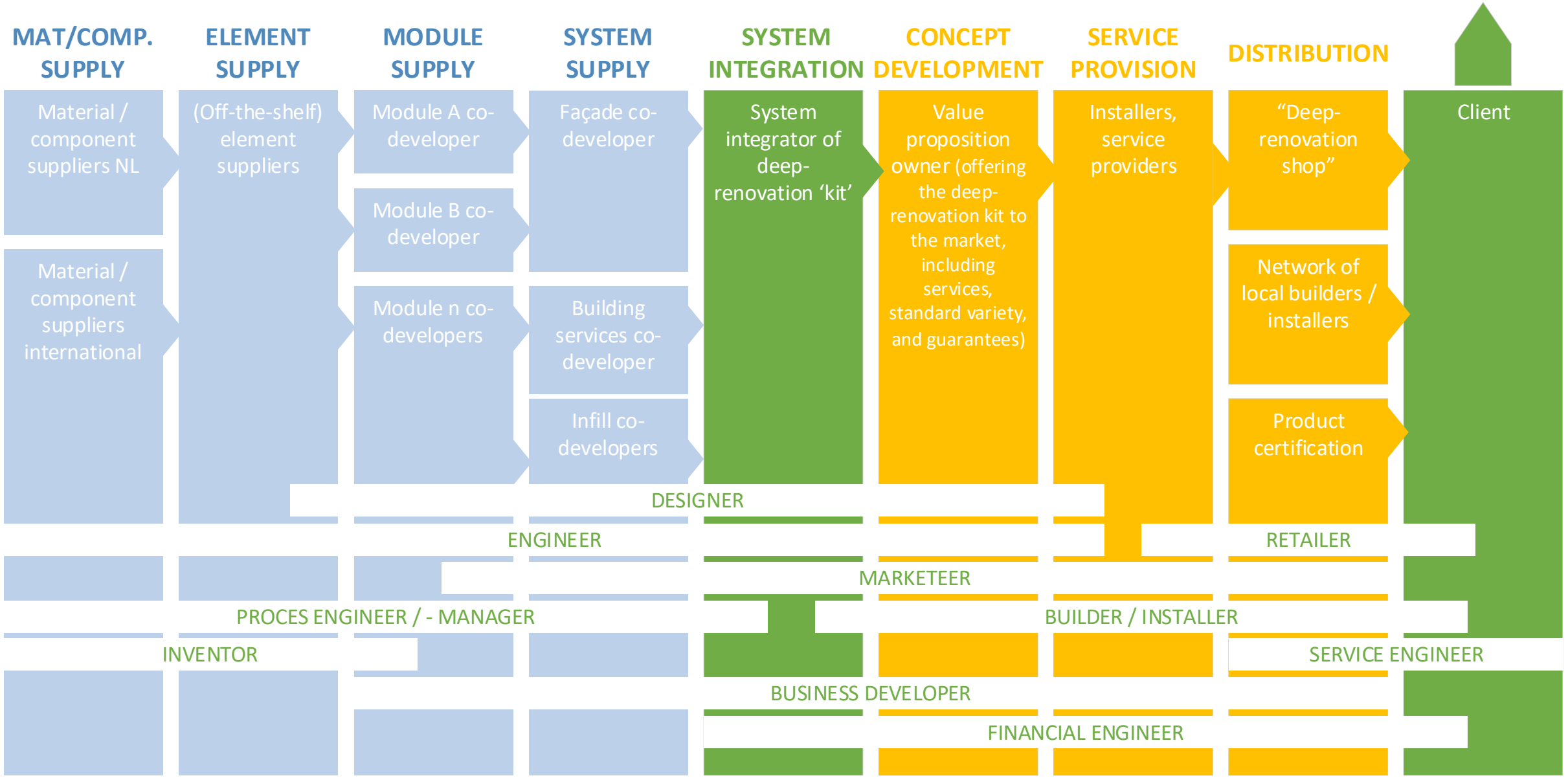
MAT/COMP. SUPPLY
ELEMENT SUPPLY
MODULE SUPPLY
SYSTEM SUPPLY
SYSTEM INTEGRATION
CONCEPT DEVELOPMENT
SERVICE PROVISION
DISTRIBUTION
Material / component suppliers NL
Material / component suppliers international
(Off-the-shelf) element suppliers
Module A co-developer
Module B co-developer
Module n co-developers
Façade co-developer
Building services co-developer
Infill co-developers
System integrator of deep-renovation 'kit'
Value proposition owner (offering the deep-renovation kit to the market, including services, standard variety, and guarantees)
Installers, service providers
"Deep-renovation shop"
Network of local builders / installers
Product certification
Client
DESIGNER
ENGINEER
MARKETEER
PROCES ENGINEER / - MANAGER
BUILDER / INSTALLER
INVENTOR
RETAILER
SERVICE ENGINEER
BUSINESS DEVELOPER
FINANCIAL ENGINEER

DRIVE

About industrialization in construction

1. **Megatrend Sustainability:** reduction of transport and therefore CO2 emissions
2. **Rising logistics costs:** reduce physical transports
3. **Individuality and mass customization:** individual products
4. **Democratization of Design and Open Innovation:** Involvement of the customer in product development
5. **Proximity to the market and point of consumption:** Just-In-Time delivery and shorter delivery times
6. **Production at the place of critical resources:** e.g. raw materials or highly qualified human resources
7. **Regionalism and authenticity:** Authenticity in special cases

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Type of barriers | preconditions

1. Construction proces	2. Cost / value	3. Expertise, skills & knowledge	4. Logistics & site operations
5. Regulatory / Building Code	6. Industry & market culture (client's desire, negative stigma's, unfamiliarity, lowest cost orientation)	7. Supply & procurement, also including liability, quality and certification issues	8. Other

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Thank you for your attention.

www.drive0.eu

Any questions?

Feel free to contact us later.
John van Oorschot, john.vanoorschot@zuyd.nl

H2020 Drive 0

@Drive0_H2020

Drive 0 EU H2020

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 841850

Panel discussion with

Ana
Tisov

Melinda
Orova

Jure
Vetršek

Maria
Founti

Maria Sara
Di Maggio

Sebastien
Delpont

Drive 0 Final Symposium and EU Clustering Workshop

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BuildUPspeed

giga regio factory by energie sprong

Coffee break and exhibition

'Projects in the spotlight'

See you back in 15 minutes



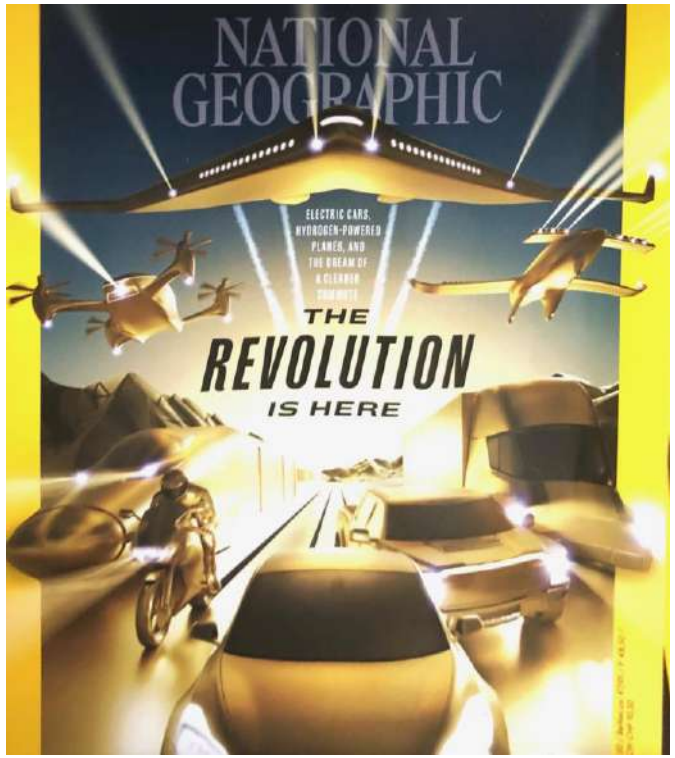

State of the market & perspectives for improved policies

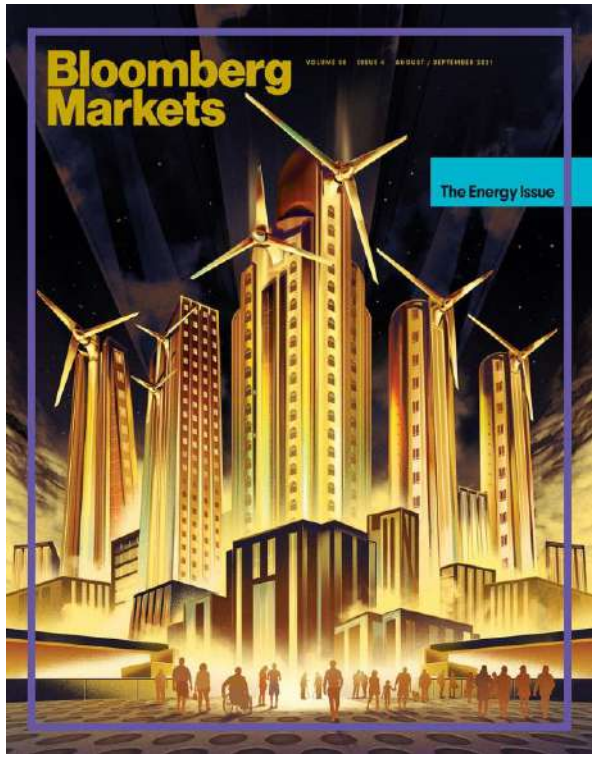
Brussels, 15/11/2023

Industrializing deep energy retrofit of buildings

Sebastien Delpont,
Head of innovation, Global Energiesprong Alliance & Director, Energiesprong France
sebastien@energiesprong.org

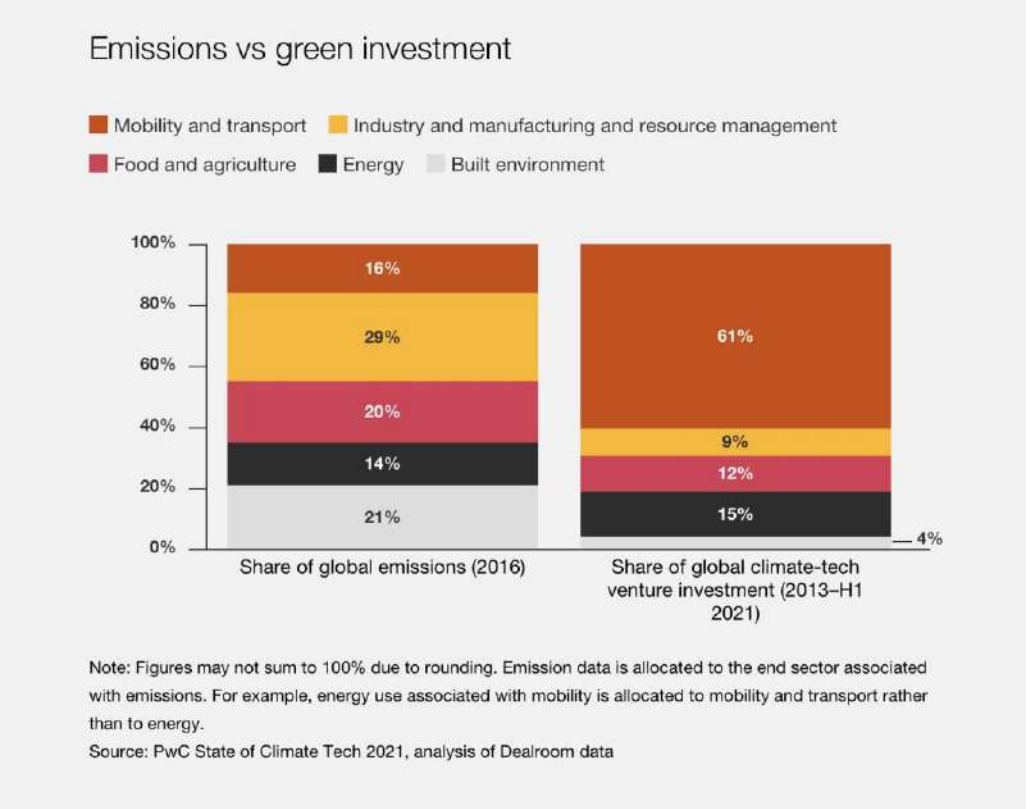
> Energy retrofit of buildings: the most underinvested key leverage of the climate transition: hype is not here, yet





Where is the cover on building energy efficiency, which is 40% of the problem ?

Investor disregard funding solutions providers for decarbonization of the building sector and that must change

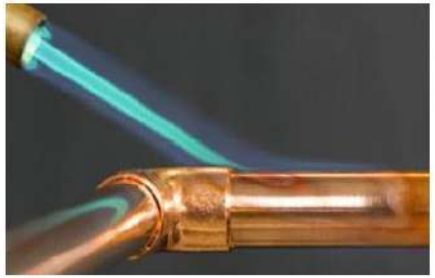


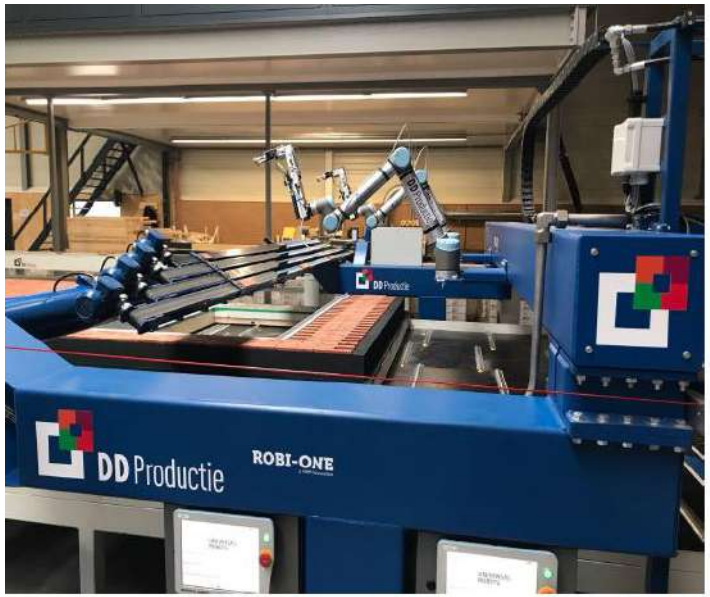
The success of a green renovation wave can not work in just financing the "demand" but also focusing on investment in the "offer". Tech innovation for energy efficiency lacks investment

Deep energy retrofit being expensive is a fact: not a fatality. Let's work on making cheaper deep energy retrofit a reality

Stop thinking we should choose between « a few deep energy retrofits » or « many light energy retrofits ». Many affordable deep energy retrofits is the way to go

> Why should construction & retrofit remains under efficient ?





Many levelers for innovation and industrialization have not been activated yet, due to lack of capacity of current player to organize it themselves

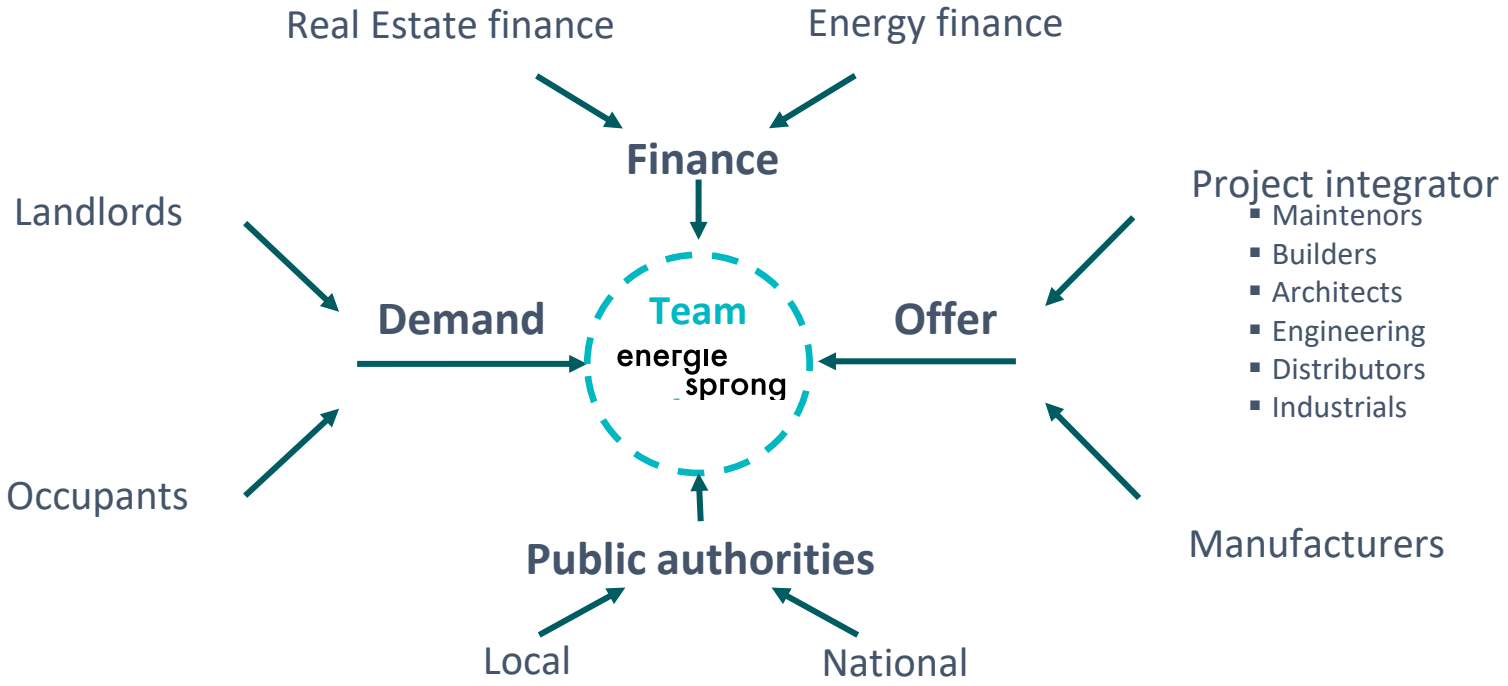
> Dare to have a simple, radical and warranty on the right market to activate a demand: toward Net Zero Energy Retrofit

Ambitious and clear (zero pesticide) : a success even is more expensive

Less ambitious and less clear : did not work well even if less expensive

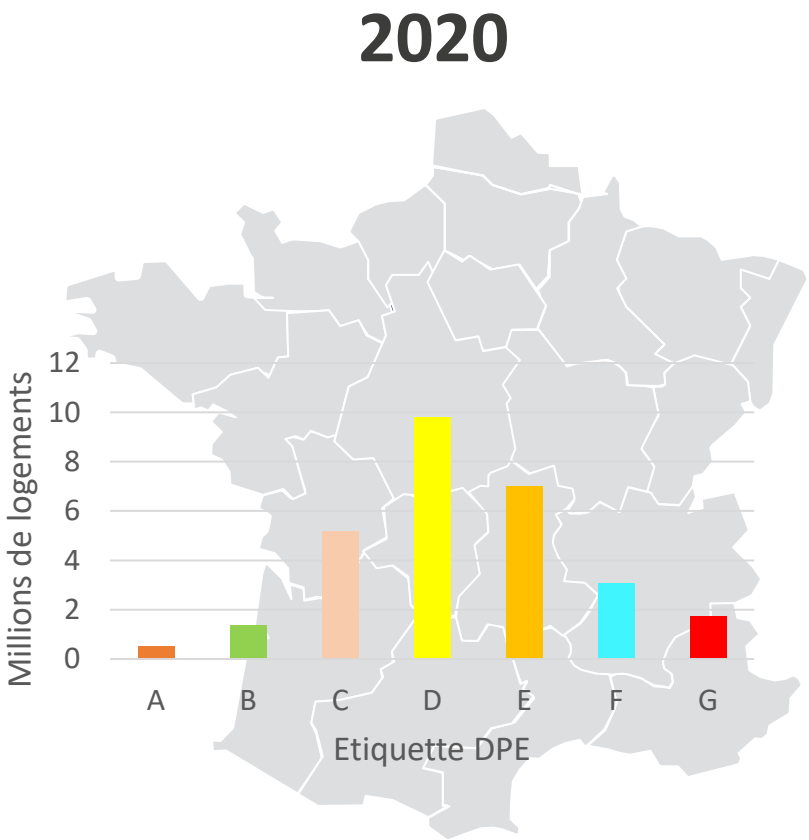
Promoting NZEB retrofit in 1 step will not be the only way but should stated as a "locomotive market" driving further innovation as organic food in agriculture

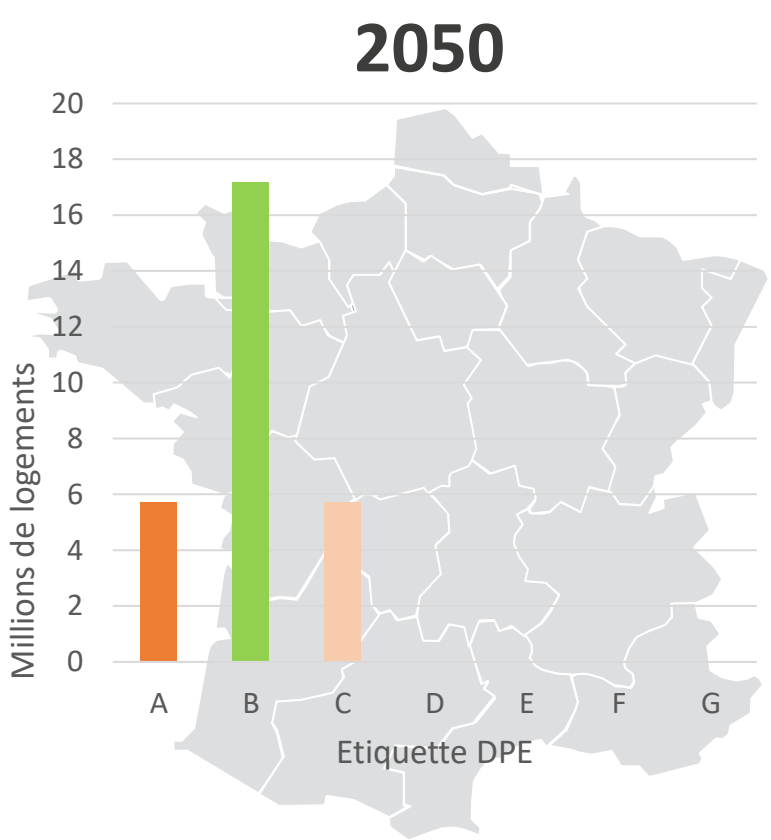
Aiming at aligning all stakeholder interests to make such a net zero market segment emerge, adjusting to national contexts



Such an approach of publicly funded « intermediation of general interest » by a market development team is an efficient & innovative public policy that support innovation in matter of technology, finance, contract or social training

No long-term climate ambition will be reached if we don't manage to develop 20 to 35 % market share segment of A label retrofit





Let be realistic, technically no all building can reach technically B level, a market segment of A level retrofit will be needed to compensate for that

The technical market for such « off site » deep energy retrofit is massive : in France, about 15 millions housing could be retrofitted this way

26,6 millions housing analyzed…

…including 22,8 millions with a need for retrofit* (~86% of the portfolio)

E=0

EnergieSprong Retrofit

9,5 Millions
housings

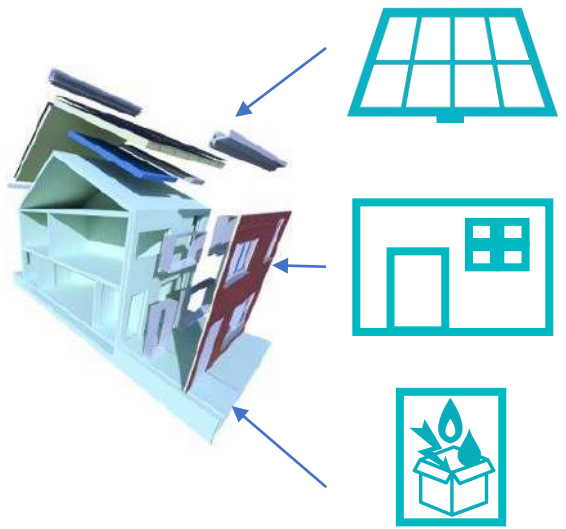
9 private market & 0,5 M social housing

E↘0

EnergieSprong Ready Retrofit

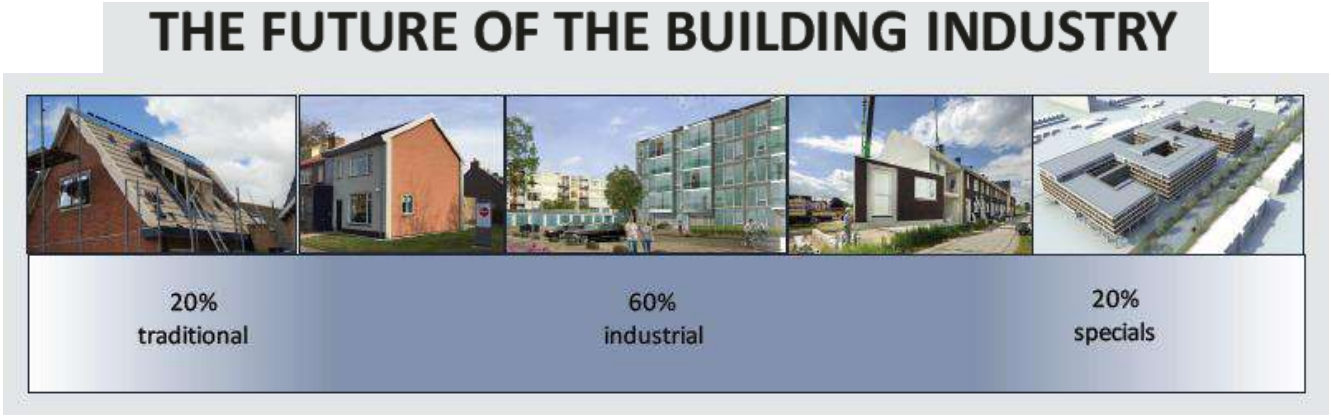
4,7 Millions
housings

3 M private market & 1,7 M social housing



From theoretical potential to a mass market, steps are needed to transform the building stock at scale

« Ready to wear » solutions are needed for an « extreme makeover » of our building stocks at building & district level

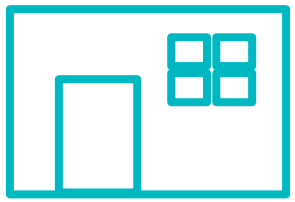


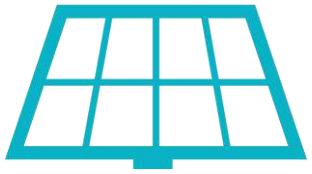
LEAN, BIM and Off-site are among the key ingredients for a success, it will help to retrofit more building, faster & to integrate new workforce (including women)

ressorts

energie sprong global alliance

More integrated solutions, going off-site with prefab façade, roofs & energy systems offer interesting perspectives





Switching from 15 to 3 integrated suppliers for providers delivering performance to end user / building owners

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The idea works in different EU countries, with many various suppliers and many housing organizations involved

Over 10 000 housing retrofitted*

NL: > 7.000 homes

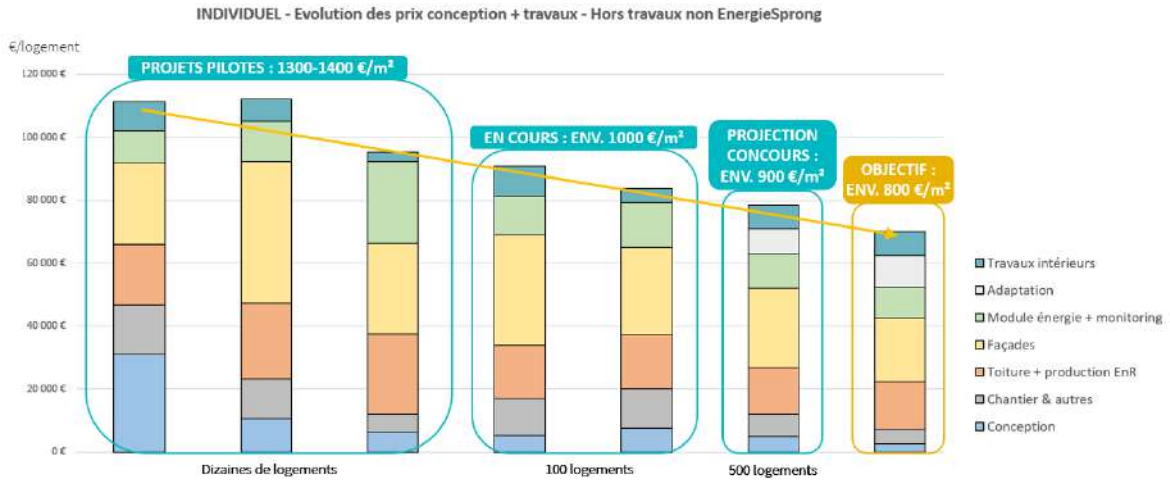
FR: > 2.500 homes

DE: > 500 homes

UK: > 300 homes

IT: > 5 homes

Price curve going down but still expensive



Energiesprong France cost-quality-impact observatory, 2021

We need more volume, more volume & more volume to carry on development in a stable & supportive environment. Rome was not built in a day

**: figures compiled by the Energiesprong movement for Net Zero industrialised retrofit*

A few different standard to apply as long they are strong and different solution mix are possible: 50 shades of industrial deep energy retrofit

It is not just about random volumes, typology matters. It is time to think building portfolio and to deal with higher investment acceptance

Maison individuelle

3 typologies de maisons construites entre 1945 et 2000, représentant 60% des consommations énergétiques finales tous usages des maisons individuelles

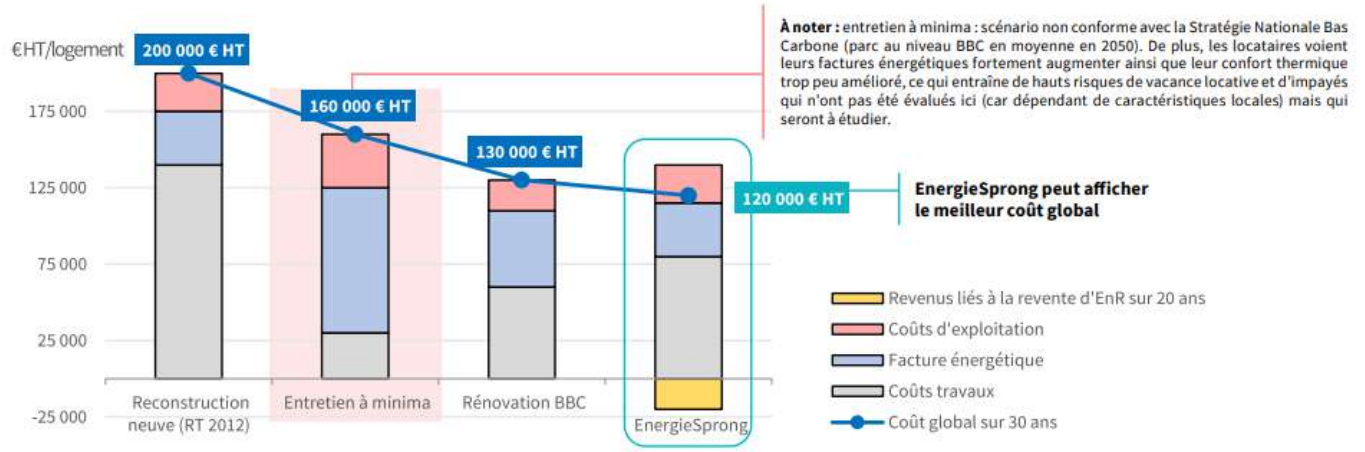
	Maison isolée sur la parcelle	*Maison en bande*	*Maison semi-isolée*
Nombre et % sur le parc social construit entre 1945 et 2000	≈ 75 000 soit 17%	≈ 100 000 soit 22%	≈ 275 000 soit 61%
Nombre et % sur le parc résidentiel construit entre 1945 et 2000	≈ 7.5 M soit 75%	≈ 650 000 soit 6%	≈ 1.9 M soit 19%
Élévation	RDC ou R+1	R+1 généralement	RDC ou R+1
Toiture	Inclinée, double pente	Peu inclinée, double pente	Inclinée, double pente

Logement collectif

3 typologies de bâtiments construits entre 1945 et 2000, représentant 75% des consommations énergétiques finales tous usages des logements collectifs

	Petit collectif isolé sur la parcelle	*Petit collectif en bande*	*Grand collectif*
Nombre et % sur le parc social construit entre 1945 et 2000	≈ 200 000 soit 7%	≈ 150 000 soit 5%	≈ 2.5 M soit 88%
Nombre et % sur le parc résidentiel construit entre 1945 et 2000	≈ 800 000 soit 14%	≈ 600 000 soit 10%	≈ 4.4 M soit 76%
Élévation	< R+4	< R+4	> R+4
Toiture	Toiture terrasse	Toiture terrasse	Toiture terrasse

Coût global sur 30 ans en individuel – pour la typologie de référence – hors travaux hors EnergieSprong



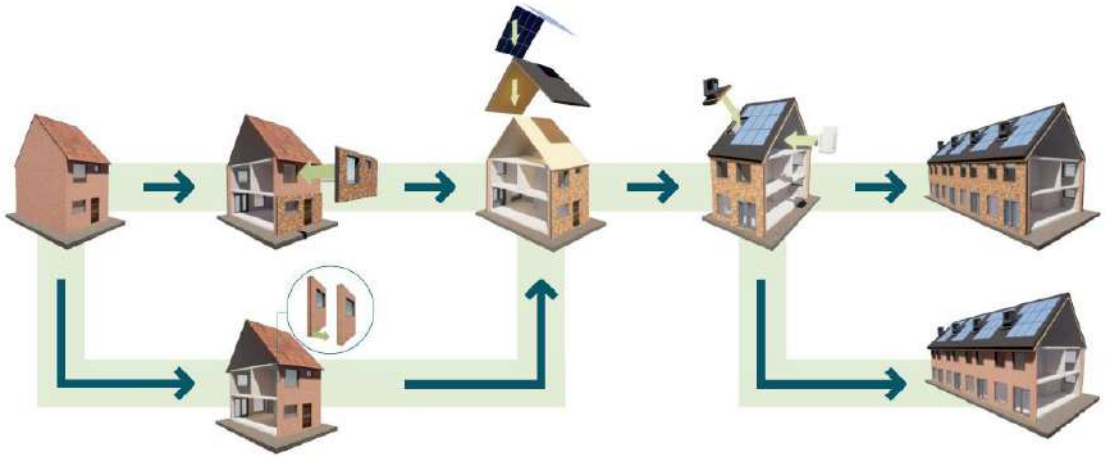
1) Ce prix n'est pas le prix minimal sur le long terme : il peut être amené à évoluer encore à la baisse au-delà des deux années à venir.
2) Prix conception + réalisation, excluant les travaux hors EnergieSprong

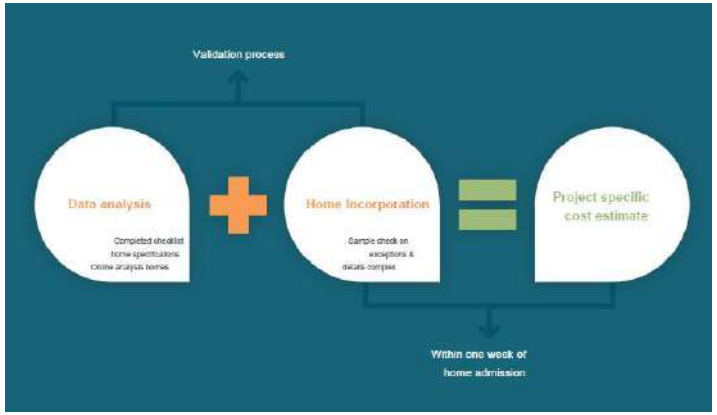
3

Energiesprong France cost-quality-impact observatory, 2021

CFO have to rethink their analysis in a post carbon world to be able to afford more than a few prototypes. Organizing & financing the replication is the challenge now. Financial regulation & habits of real estate has to change

Future is thinking regional catalogs for dozen of thousands deep enery prefab retrofit to be delivered in every region

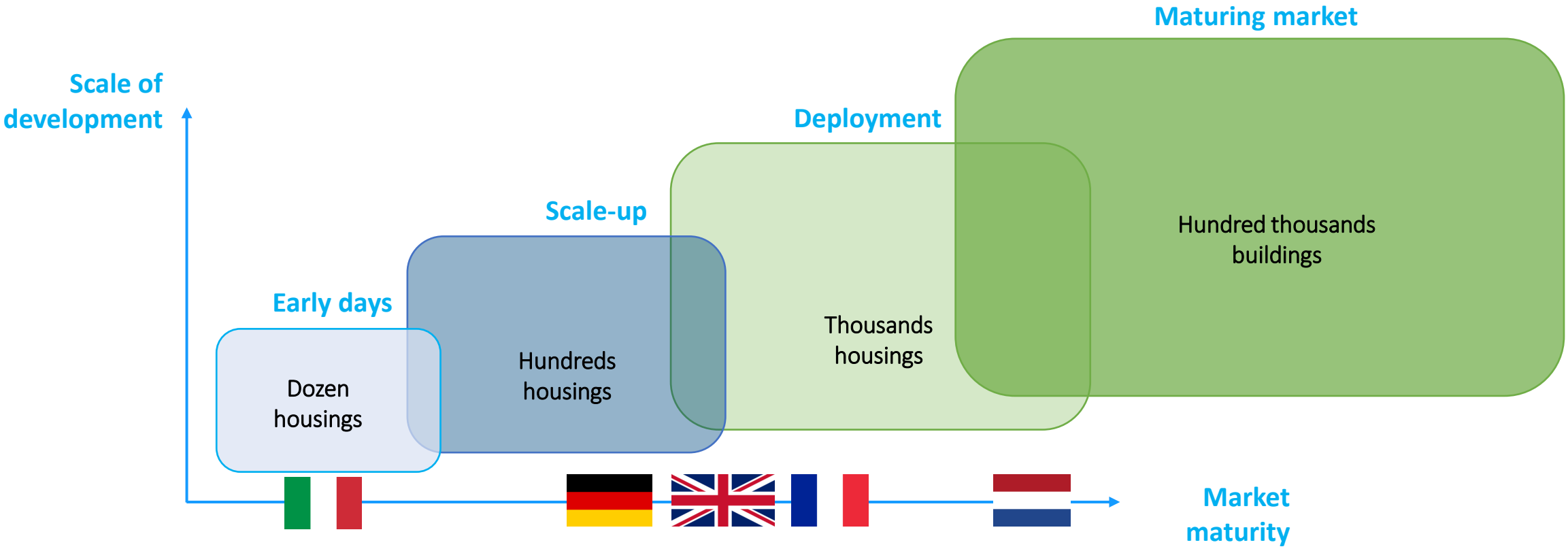




ressorts

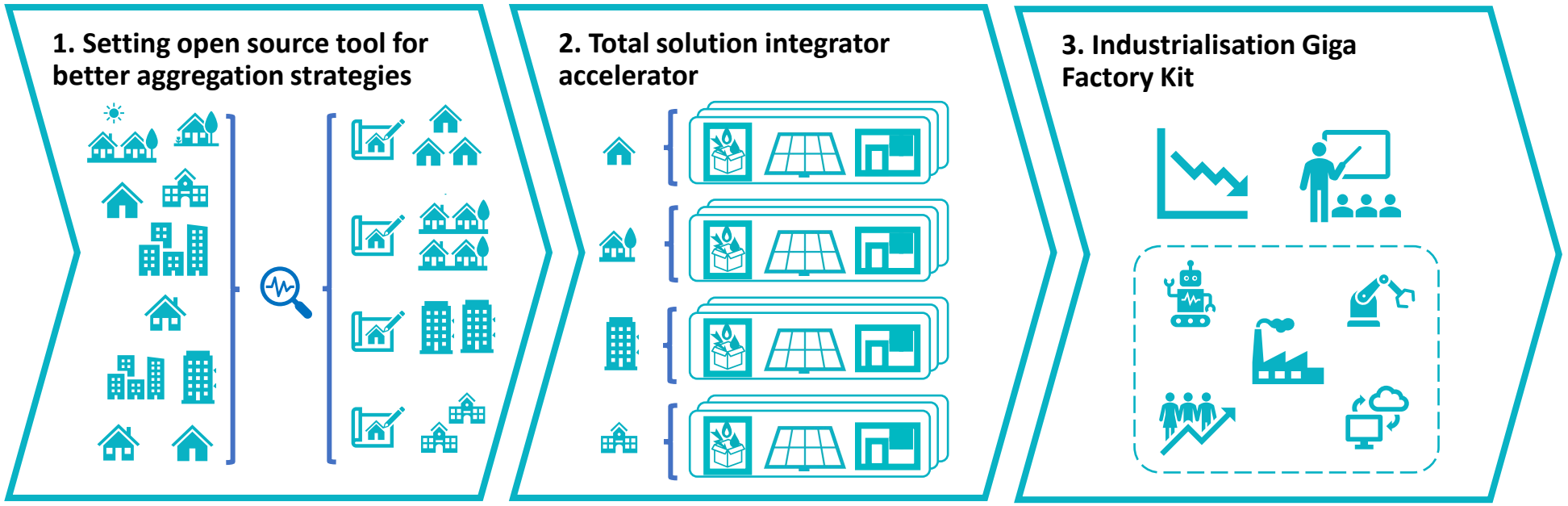
energie sprong global alliance

Different market maturity in different EU countries, the challenge is to accelerate strongly these development



Challenges are different at different market development stages, but this is EU beauty, some are paving the way for us to smartly copy / paste

> Some EU schemes as LIFE, Horizon or Interreg North West Europe have funded early innovation effort (social, financial, technical)



giga regio factory
by energie sprong

HOUSING EUROPE

ressorts

Example of Giga Regio Factory : **with Build Up, Housing Europe & Ressorts as partners (among others)**

Among these projects: LIFE Giga Regio Factory, Energy poverty 0, COSME Reno, Street HP Reno, Interreg NWE Circular Reno, Indu Zero, E=0, MustBe 0… Horizon Transition 0

ressorts

energie sprong global alliance

Jumping from 10 000's to million's is our challenge. New frontiers are to be explored to succeed and move forward

France in 1900 for cars

17 000 cars

Then it jumped into millions

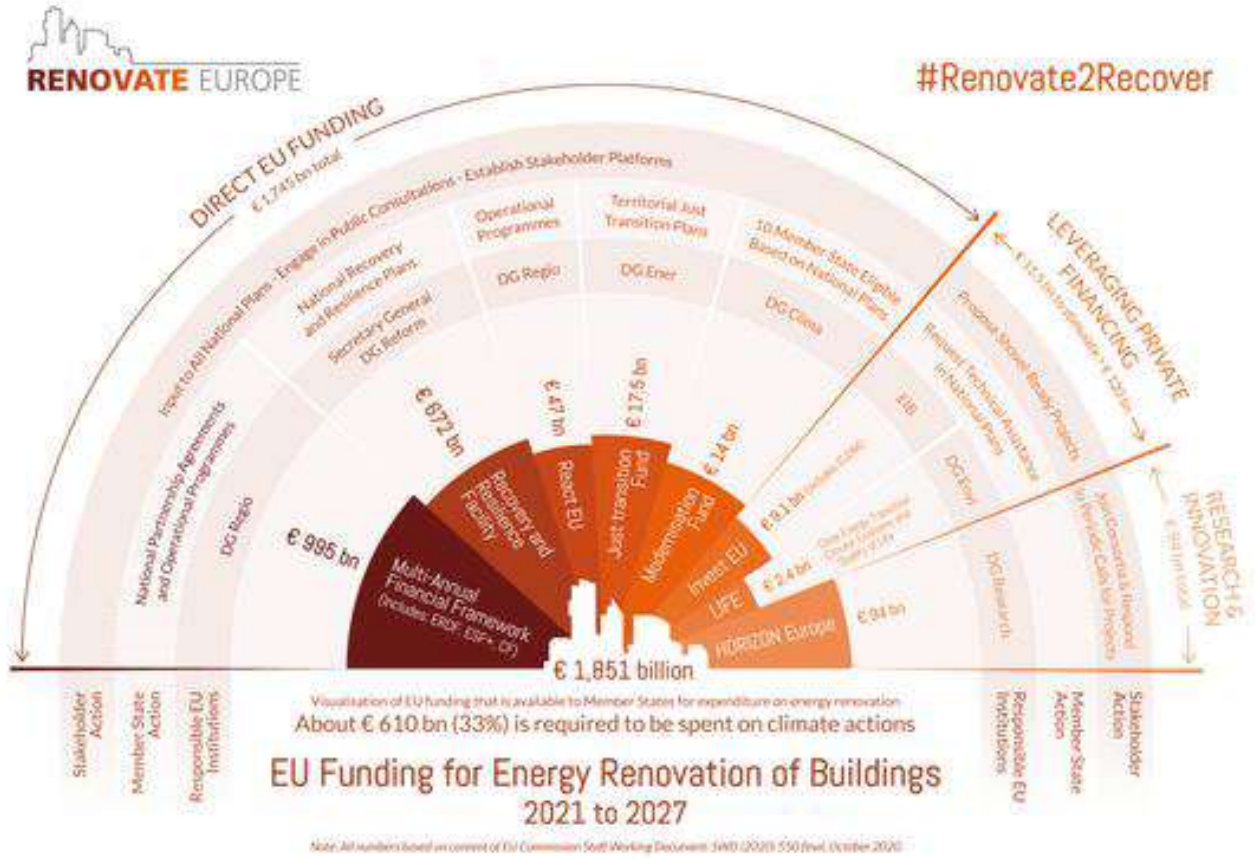
EU in 2023 for Industrial retrofits

10 000 homes

Now to be organised to jump into millions

That new level of development of the industry needs different public policies: it proves to be efficient & working well, now need to change pace

EU is already active on building retrofit, the point is: how to improve the split of money injected & other policies to support industrialization



What EU mirror of IRA for industrial retrofit market players ?

BRIEFING
Requested by the ECON Committee

European Parliament

EU's response to the US Inflation Reduction Act (IRA)

The US Inflation Reduction Act (IRA) of August 2022[1] is a budget reconciliation measure comprising eight titles, which cover a very large spectrum of US policies. In essence, IRA aims to curb inflation and to invest into domestic clean energy production. The law represents the largest effort into addressing climate change in US history. It aims to achieve a reduction of around 40% of greenhouse gas emissions in 2030 compared to 2005. The IRA represents a radical departure from the politics of the Trump era and remains controversial within the US political establishment. Outside the US, its resolute pro-climate aspects have been broadly hailed, yet a number of its measures, most notably local-content requirements (LCRs), such as 'Made in America' requirement for cars and batteries, have come under severe criticism.

This paper will concentrate on the IRA's main aspects that have sparked a severe trans-Atlantic dispute, and that might have consequences not only for the bilateral trade relations and a possible diversion of direct foreign investments, but also on the possible re-shaping of EU policies, including a shift in the balance between the Single Market and industrial policy. EU reactions will be outlined, such as the adaptation of State aid rules and the Green Deal Industrial Plan. Beyond US-EU relations, LCRs also have the potential to undermine the free trade principles that are at the core of the World Trade Organisation (WTO).

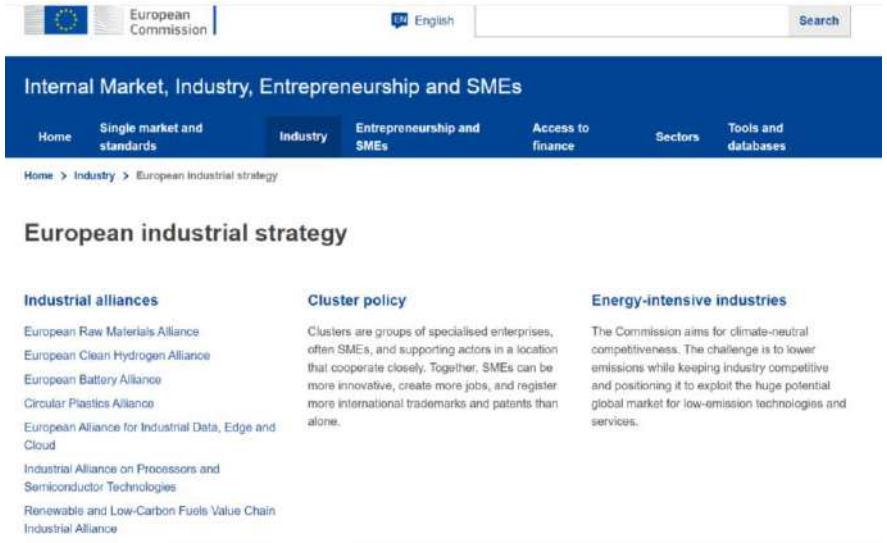
US Inflation Reduction Act - A new paradigm

Successive US administrations went in and out of international climate agreements, with President Clinton signing the Kyoto protocol, President Bush not pursuing that policy, President Obama signing its follow-up, the Paris protocol, President Trump reversing these policies, and finally President Biden opting back into the

For instance, a support to the demand without strong standardized conditions does not help to structure an industry and drive cost down. A different balance between offer / demand / intermediation to be also considered

For now, EU industrial strategy only cover 60% of our climate challenge. Deep energy retrofit is missing

A new industrial strategy to set



IPCEI to set to launch EU champions ?

Decarbonizing power (wind, PV), industry (hydrogen), mobility (battery): Great ! Building a deep energy retrofit industry should be the next step: support to heat pump is good positive step but offsite integrated solutions to be supported too

> Improved EU & national Policies are needed to support that market scale up: toward demand, offer & market development

Axis 1: support to a standard linear growing demand

- Lower borrowing rate for buildings owners (with EIB?) going NZEB in one step
- Temporal decreasing subsidies for industrial retrofit as it was made with PV feed in tariff, praised as a good practice
- Mandatory NZEB % retrofit in energy retrofit target to activate a growing stable demand (cf % organic food in agriculture)

Axis 2: simplify the support to market intermediation

- Promote the "market development team" model, acting for intermediation of general interest, as it was made for One Stop Shop
- Create stable ways to finance Market Development Team over 5-10 years to avoid up and down

Axis 3: support to an EU better industrial offer

- Strong subsidy support EU industrial champion for NZEB off site retrofit beyond State Aide rules (IPCEI) to set gigafactories & improved products
- Lifting insurance barriers to have a real common market for solutions for deep energy retrofit

Successful sustainable industries have benefited from combined support scheme to the offer, intermediation (or standardization / grouping) and the demand

ressorts

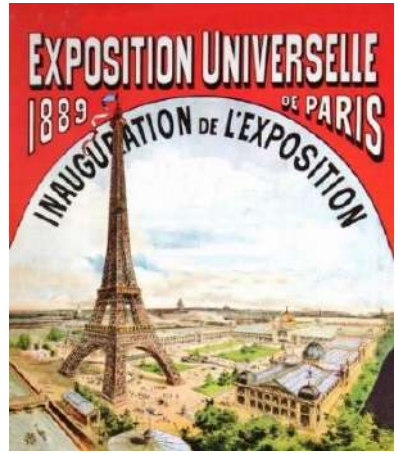
global energie sprong alliance

> Soft power also matter: may-be it is time to go one step further in the New EU Bauhaus & organise an EU EXPO NZEB RENO exhibition ?

Expo Reno Universelle – Brussel 2025 ?

And then: Berlin, Paris, Milano, Rotterdam… ?

Showing and exposing on real sites in one city during 6 month solutions from all EU and the world from NZEB deep energy retrofit



> Join the movement and help us go many steps further in that move for more industrial deep energy retrofit

We want to make waves and support the Green renovation wave

Email : sebastien@energiesprong.org

EU policies supporting the twin transition of construction

Drive 0 Final Symposium and Clustering Workshop
Brussels, 15 November 2023

Philippe MOSELEY, Policy Officer, DG GROW Construction Unit

Policy context

Political imperative

European leadership

Changing legislative and geopolitical context

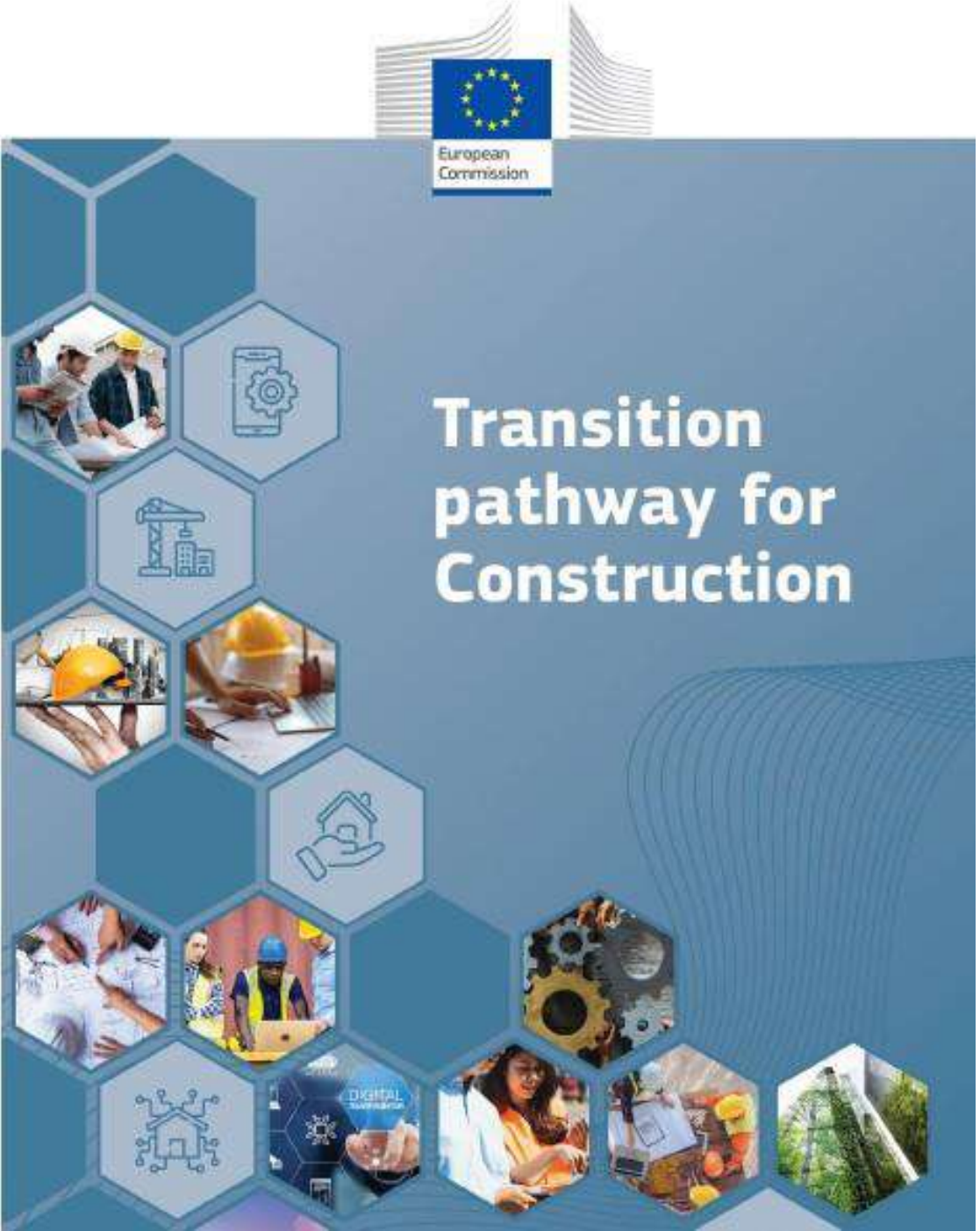
Environmental impacts of construction

Opportunities: renovation wave, shift to circular economy

The EU construction industry ecosystem

- 9.6% of EU Gross Value Added (EUR 1 158 billion)
- 25 million jobs, 5.3 million firms
- 37.5% of waste generated (2020)
- Half of resources extracted
- Buildings: 40% of energy consumed

European Commission



Transition Pathway (March 2023): https://ec.europa.eu/docsroom/documents/53854

- Co-created with industry, Member States and other stakeholders
- A vision for the green and digital transition
- Recommendations of concrete action

Call for new commitments aligning with the Transition Pathway: https://ec.europa.eu/eusurvey/runner/TransitionPathwayConstruction_Commitments

European Commission

Construction Products Regulation revision

Unlock growth and jobs potential

Improve competitiveness

Greening of manufacturing

Sustainable built environment

Circular economy

Digitalisation of construction

CPR review: https://europa.eu/!Dy69pr

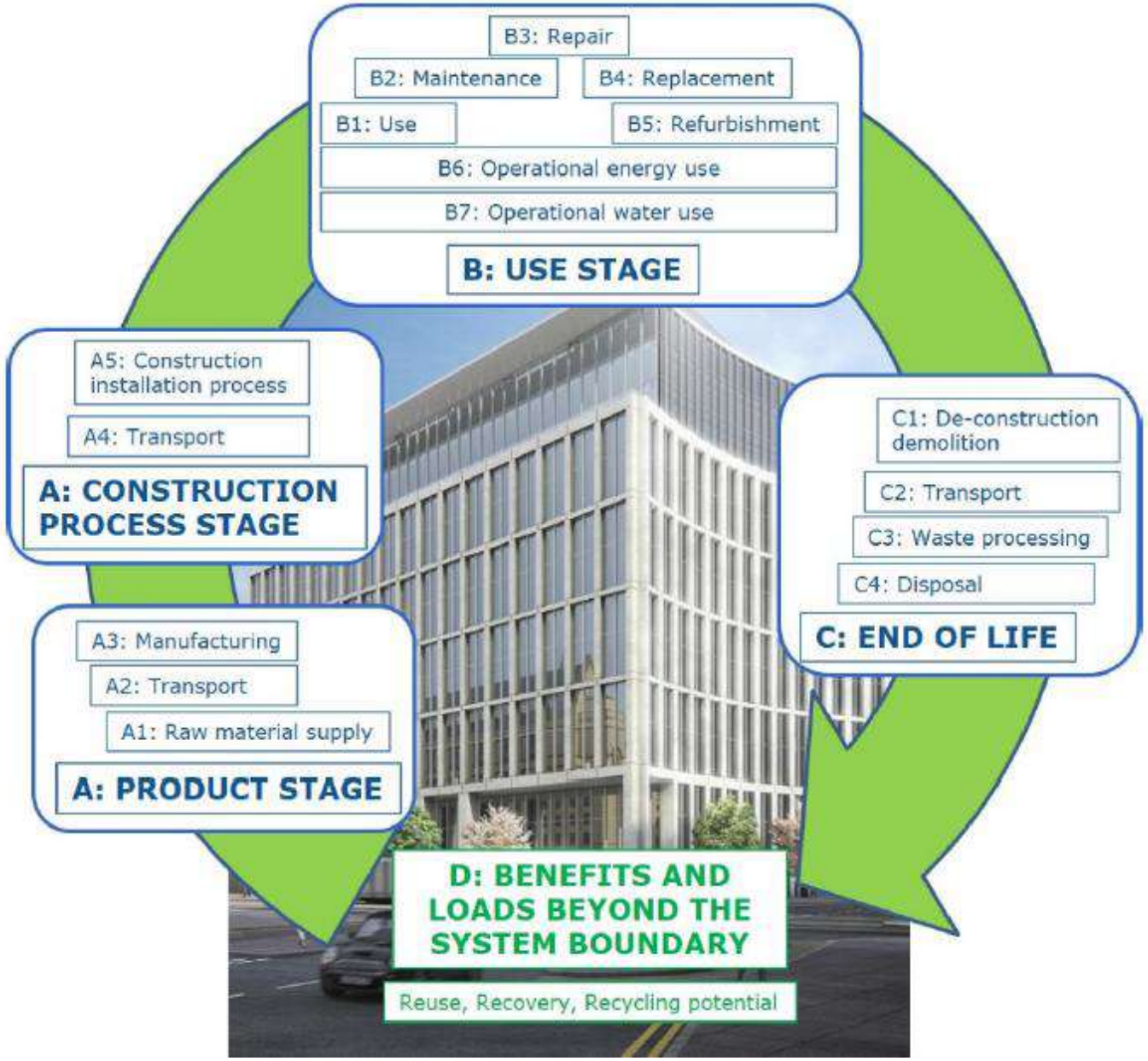
European Commission

CPR acquis preparatory work

Implemented by harmonised standards to be cited in the Official Journal
Level playing field for construction products (no barriers to trade)
Regulatory consistency to guarantee healthy internal market

2021	1	Precast concrete products
2021	2	Structural metallic products
2022	3	Reinforcing prestressing steel
2022	4	Doors, windows and shutters
2023	5	Cement
2023	6	Thermal insulating products
…	7	Structural timber products
	8	Concrete, mortar and grout
	9	Masonry
	10	Aggregates
	11	Fixed firefighting equipment
	12	Road construction products
	13	Floorings
	14	ETICs
	15	Curtain walling
	16	Wood based panels
	17	Structural bearings
	18	Kits and assemblies
	19	Wall and ceiling finishes
	20	Space heating appliances
	21	Roof coverings
	22	Circulation fixtures
	23	Waste water disposal
	24	Adhesives
	25	Gypsum
	26	Anchors and fasteners
	27	Membranes
	28	Glass
	29	Geotextiles
	30	Sanitary appliances
	31	Pipes and tanks
	32	Cables
	33	Chimneys
	34	Sealants

European Commission



The stages in a building life cycle, based on EN 15978.
Source: JRC 2021 Level(s)

Whole life cycle GHG emissions of buildings

- Few EU level statistics & data
- New policy area
- Little experience in some Member States and industry actors
- Complex issue requiring joined up thinking
- EU Roadmap to be presented in Staff Working Document (spring 2024)

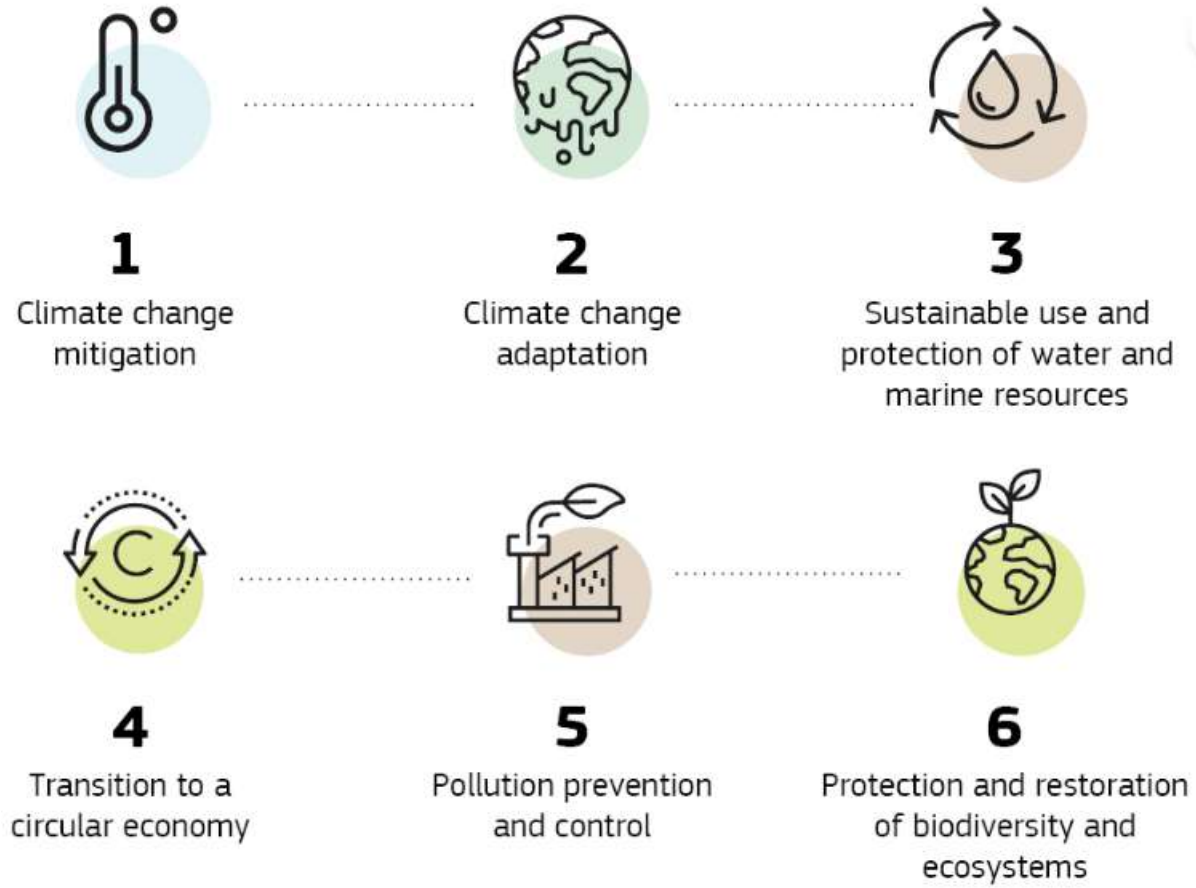
European Commission

EU Taxonomy for sustainable activities

Purpose:

- incentivise direct investments towards “sustainable” economic activities
- create objective and transparent criteria for financial institutions to report on the sustainability of their portfolios

➔ Mitigate market fragmentation, create security for investors



EU Taxonomy: background https://finance.ec.europa.eu/sustainable-finance/tools-and-standards/eu-taxonomy-sustainable-activities_en

European Commission

EU Taxonomy Environmental Delegated Act

Annex II (Transition to a circular economy)

Legal texts:
https://finance.ec.europa.eu/publications/sustainable-finance-package-2023_en

European Commission

Study ‘Measuring the application of circular approaches’

Study aimed to identify to what extent companies in the construction ecosystem are applying circular approaches in practice

- A majority of companies (70%) are applying circular approaches.
- Only a minority (38%) are measuring this.
- Recommended 19 indicators to measure circularity in construction
- Drivers and barriers to measurement identified.

Final study report: https://europa.eu/!fJdBhh
Annexes: https://europa.eu/!qHKTfc

European Commission

Study ‘Measuring the application of circular approaches’

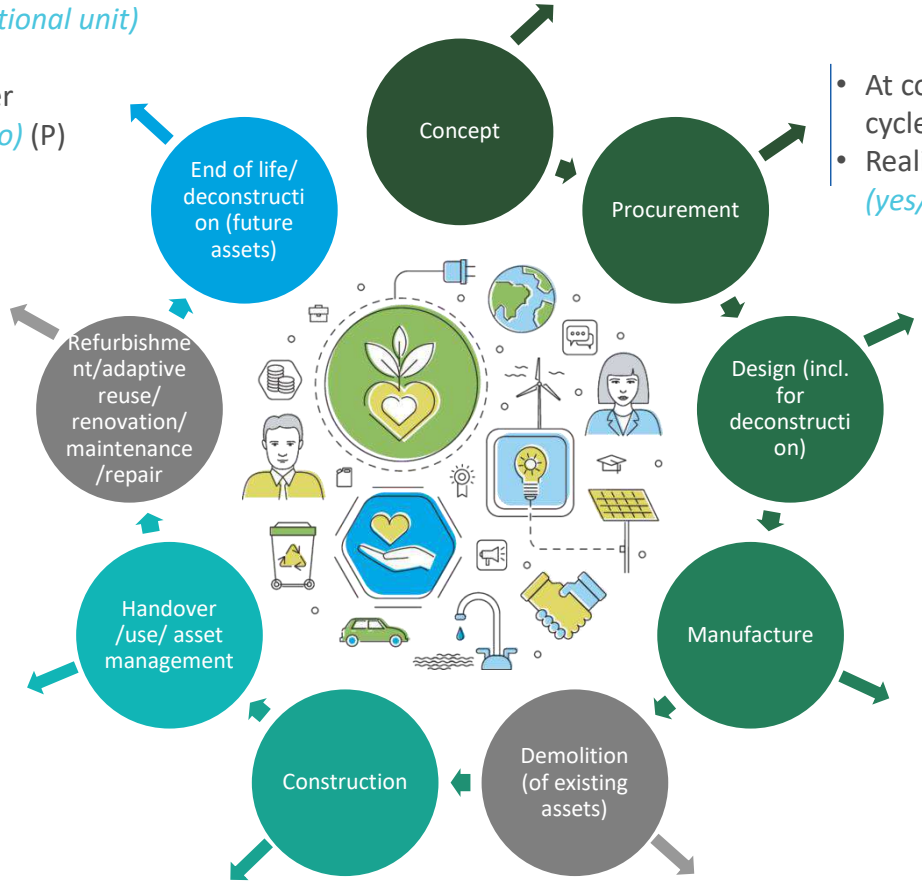
- Reused/recycled content *(% by mass)* (B)
- Average age at demolition *(Years)* (U)

- Residual value per unit product/material at end of life *(euros per functional unit)* (P)
- Part of an Extended Producer Responsibility system *(yes/no)* (P)

- At concept stage: comparison of asset life cycle assessment *(kgCO2 eq/ m2/yr)* (B)
- Realistic end of life scenarios developed *(yes/no)* (P)

- Construction related waste generated through refurbishment cycles *(tonnes/100K Euros (project value))* (B)
- Refurbishment/transformation rate of buildings/infrastructure portfolio *(% of buildings/infrastructure refurbished/year)* (O)

- Designed for disassembly/deconstruction *(% reuse potential by mass)* (B)
- Average reused and recycled content in new buildings/infrastructure (circular inputs) *(% by mass)* (O)



- Effective utilisation of building (e.g. levels of occupancy) or asset; intensiveness of use *(hours of utilisation/m²)* (B)
- Predicted service life of buildings/infrastructure portfolio *(average number of years)* (O)

- Remanufactured/reused content *(% by mass)* (P)
- Reused, recycled and secondary content input (manufacturer level) *(% by mass)* (O)

- Wastage rate at installation *(% by mass)* (P)
- Construction waste generated on and off site *(tonnes/100K Euros (project value)* (B)

- Hazardous waste generated at demolition *(% by mass)* (B)
- Average age at demolition *(years)* (U)

Indicator level of application:

P: Product level
B: Building/asset level
O: Organisational level
U: Urban level

The two stages in grey are not necessarily a part of the ecosystem – as they might occur or not.

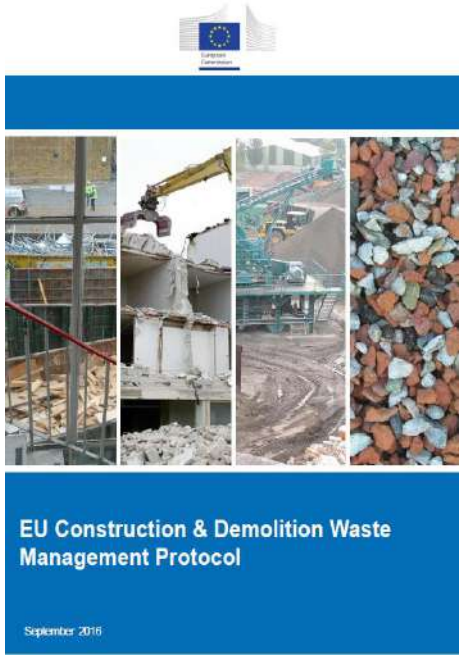
European Commission

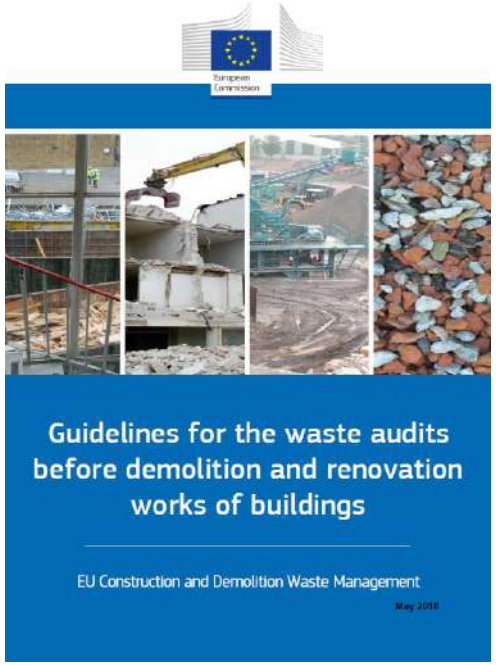
EU Construction & Demolition Waste Management Protocol

EU CDW Management Protocol (2016)
Guidelines for waste audits (2018)
Voluntary guidance documents (link), now being revised and updated

Revision now underway. It will aim to reflect recent policies (e.g. CEAP, Taxonomy, CPR), technical developments

Collaboration/co-creation with Member States and stakeholders expected during 2023-2024





European Commission

Digital transition of construction

‘Support of the digitalisation of the built environment, public procurement and SMEs in construction’

- Preparing the ground for a construction **data space**
- Supporting the digitalisation of **building permit** systems
- Supporting adoption of Building Information Modeling (**BIM**)

Technical study for the development and implementation of **Digital Building Logbooks** in the EU

+ several ongoing Horizon Europe projects on digital permits and logbooks

European Commission

Thank You! Merci! Gracias! Diolch!

https://single-market-economy.ec.europa.eu/sectors/construction_en

EU Construction Ecosystem

Coffee break and exhibition

'Projects in the spotlight'

See you back in 15 minutes

3rd session:

From practice to policy to ignite transformation

Drive 0 Final Symposium and EU Clustering Workshop

Panel discussion with

Philippe
Moseley

Spyros
Mathioudakis

Ruth
Schagemann

Sebastien
Delpont

Emmanuelle
Causse

Julien
Dijol

Drive 0 Final Symposium and EU Clustering Workshop

Lunch break

See you back in 60 minutes

Drive 0 Final Symposium and EU Clustering Workshop

4th session:
Illuminating opportunities to unleash the solutions market potential

Drive 0 Final Symposium and EU Clustering Workshop

DUTCH DEMONSTRATOR

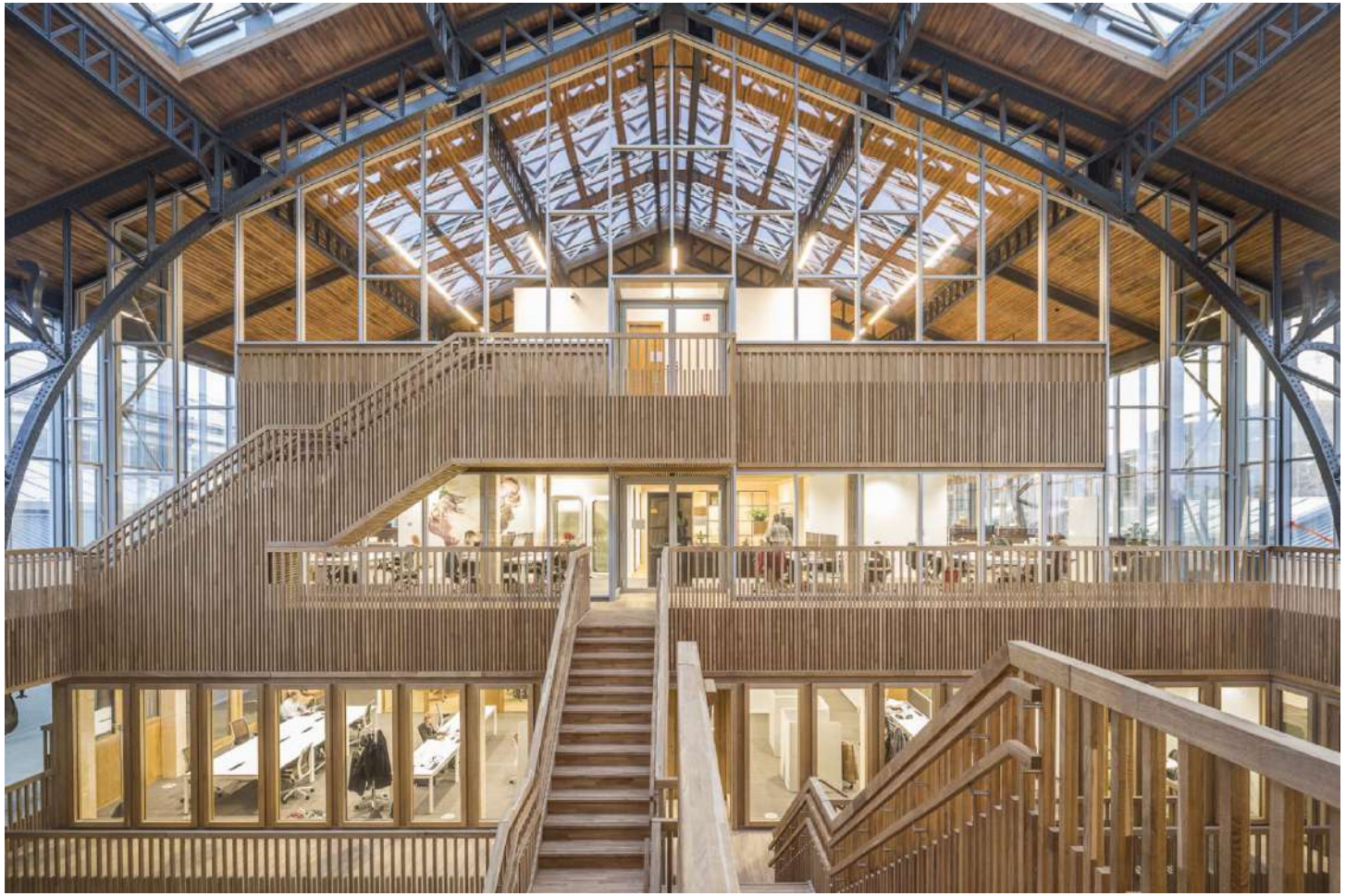
Sparrenlaan 7 , Rijssen Netherlands

November 15th 2023

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 841850

About WEBO

About WEBO



DRIVE WEBO

About WEBO

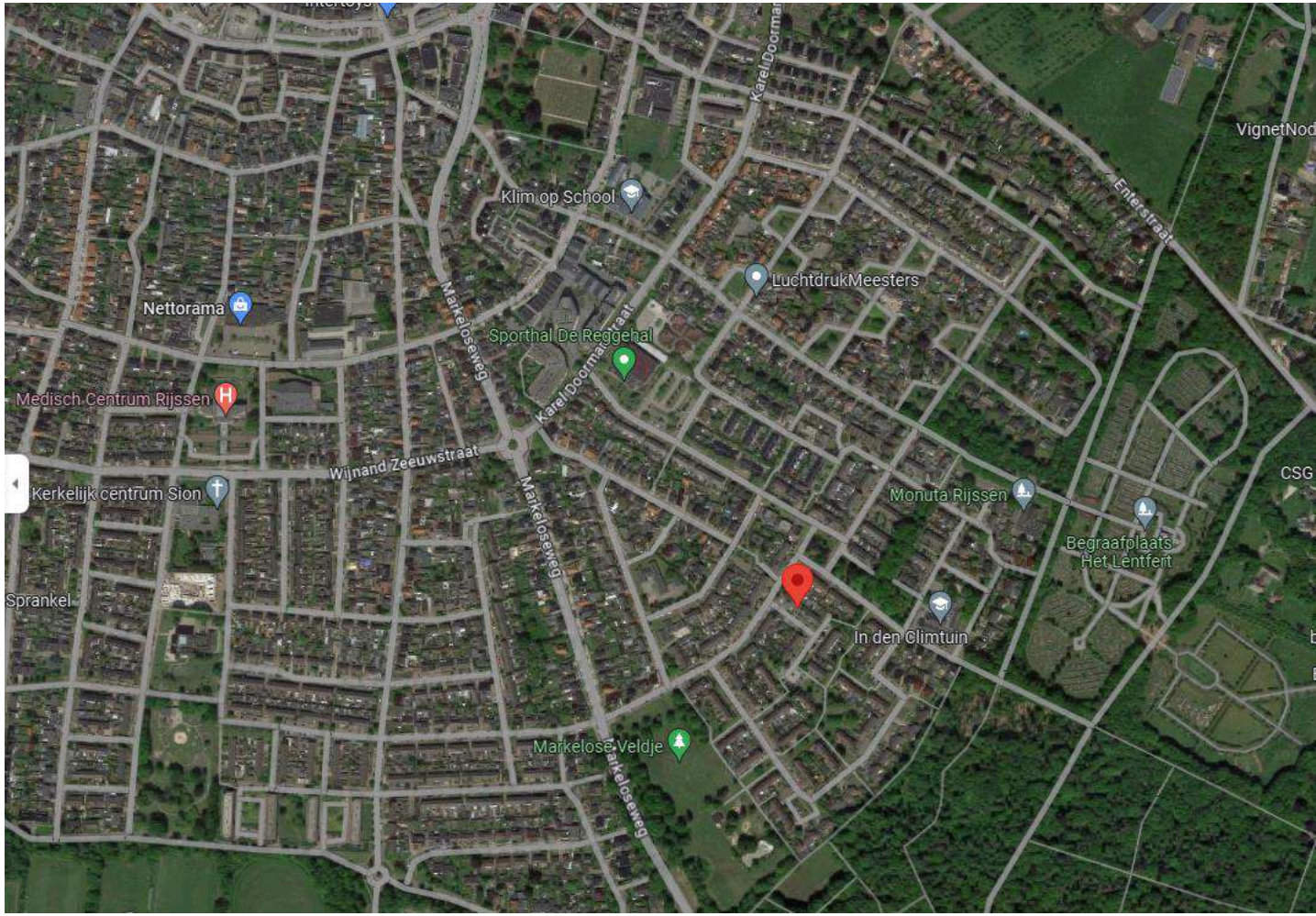
DRIVE WEBO

DRIVEO Demonstrator - Sparrenlaan 7

Sparrenlaan 7

Location


Wilhelmsha
Emden
Groningen
Alkmaar
Zwolle
Amsterdam
Nederland
Den Haag
Rotterdam
Münster
Dortmund
Essen
Eindhoven
Düsseldorf
Antwerpen
Brugge
Gent
Brussel
Keulen


Klim op School
LuchtdrukMeesters
Nettorama
Sporthal De Reggehal
Medisch Centrum Rijssen
Markeloseweg
Wijnand Zeeuwstraat
Kerkelijk centrum Sion
Monuta Rijssen
Begraafplaats Het Lentfert
Sprankel
In den Climtuin
Markelose Veldje
Enterstraat
CSG

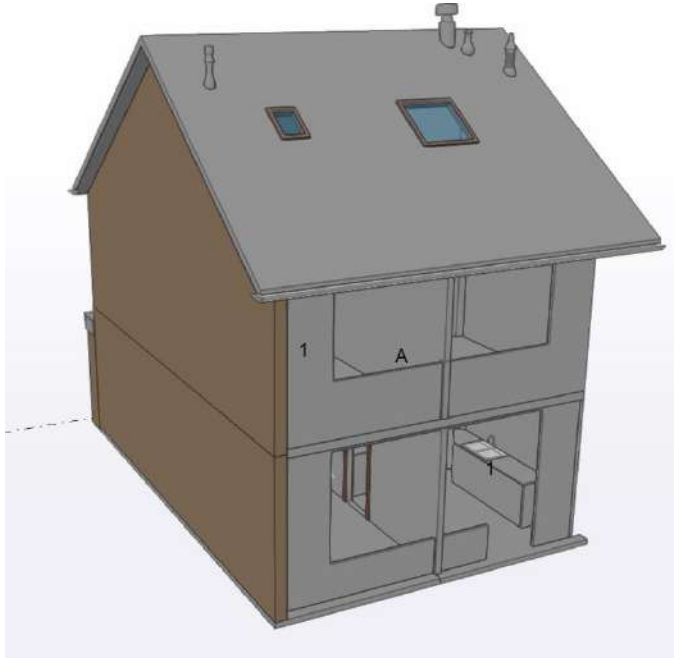
Renovation concept DRIVEO

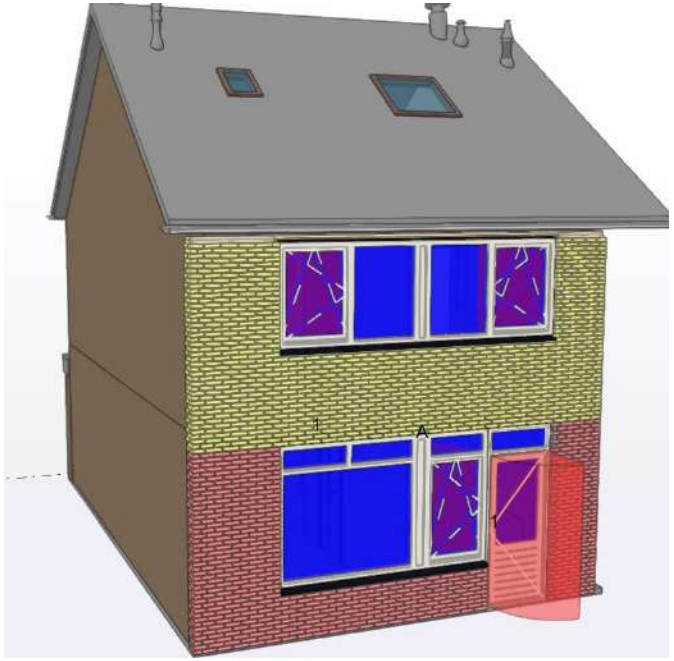
- Net-zero
- Use circular products
- Swift renovation proces
- Low-cost

The DRIVEO solutions in practice

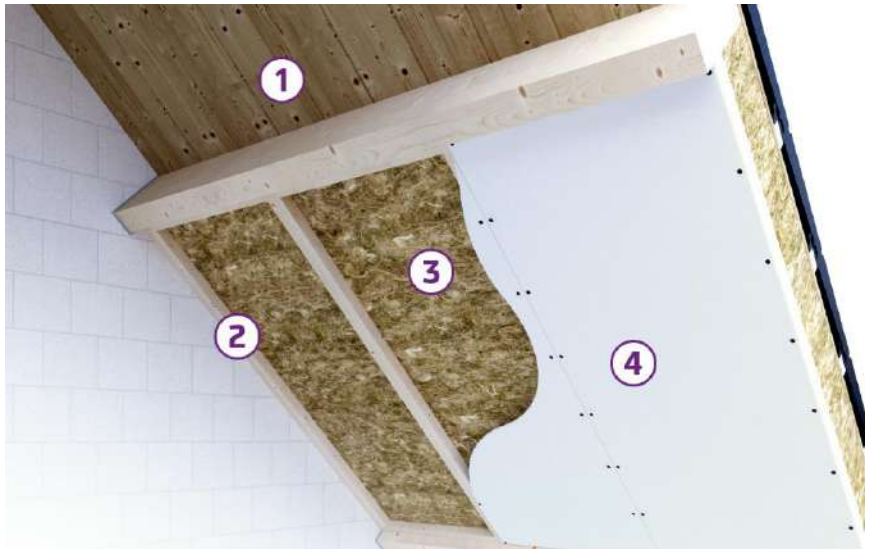
1. Insulate cavities on front, and side of dwelling
2. Instal prefab facade panels at the back
3. Replace windowframes
4. Insulate roof and floor
5. Install prefab skid with heatpump and heat recovery system

The DRIVEO solutions in practice





The DRIVEO solutions in practice



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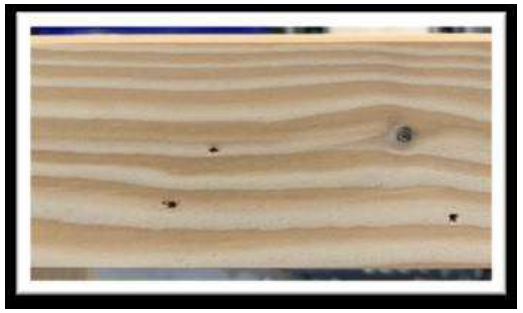
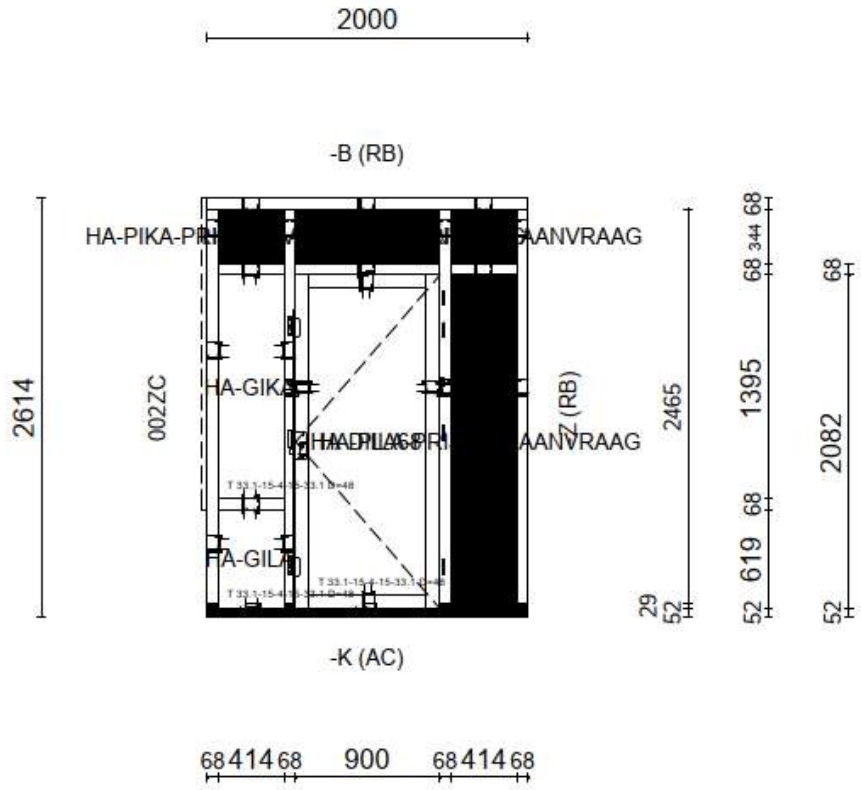
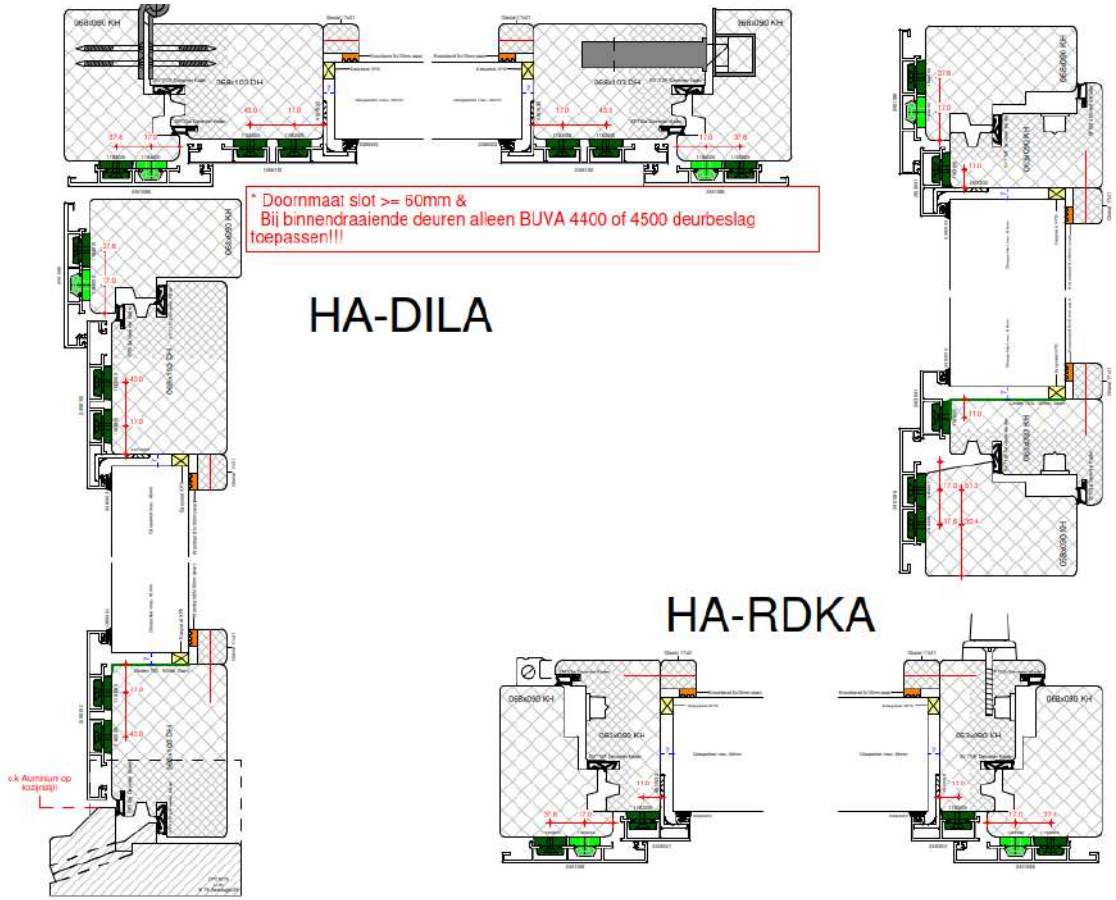
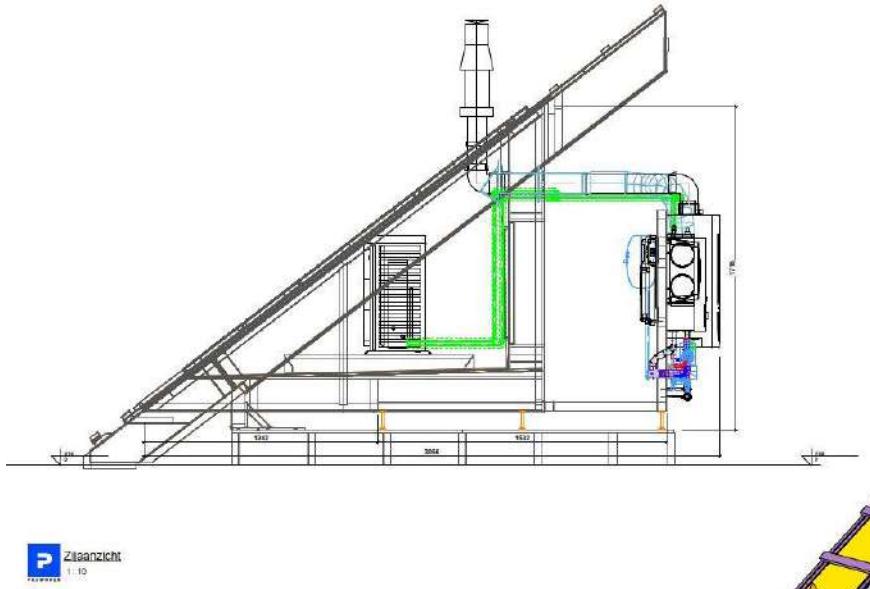


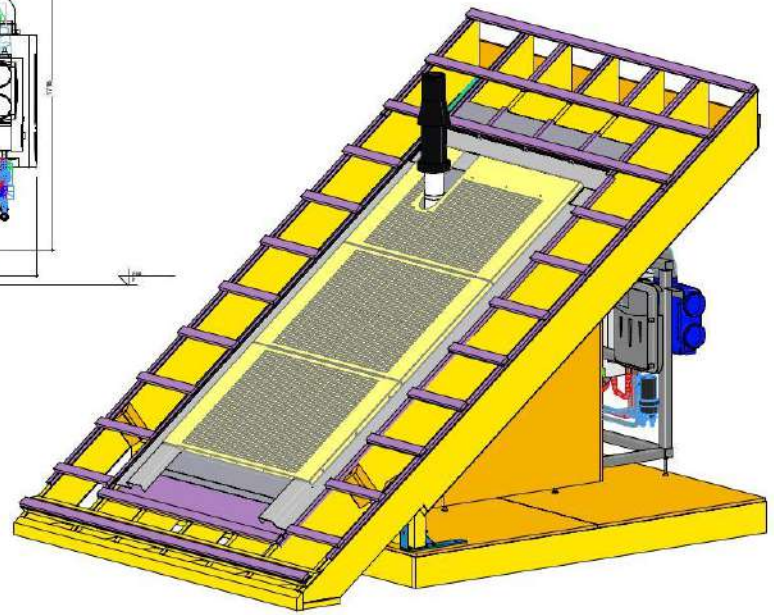
The DRIVEO solutions in practice





The DRIVEO solutions in practice





The DRIVEO solutions in practice

Costs:
- € 69.800,00

Time on site:
- 7 days

Lessons learnt

- Circular solutions are readily on hand in NL
- Certification is not a big obstacle any more for terraced houses
- Engineering and planning process takes large amount of total effort

Thank you for your attention!

Bart Voortman

bvoortman@webo.nl

COLOFON:

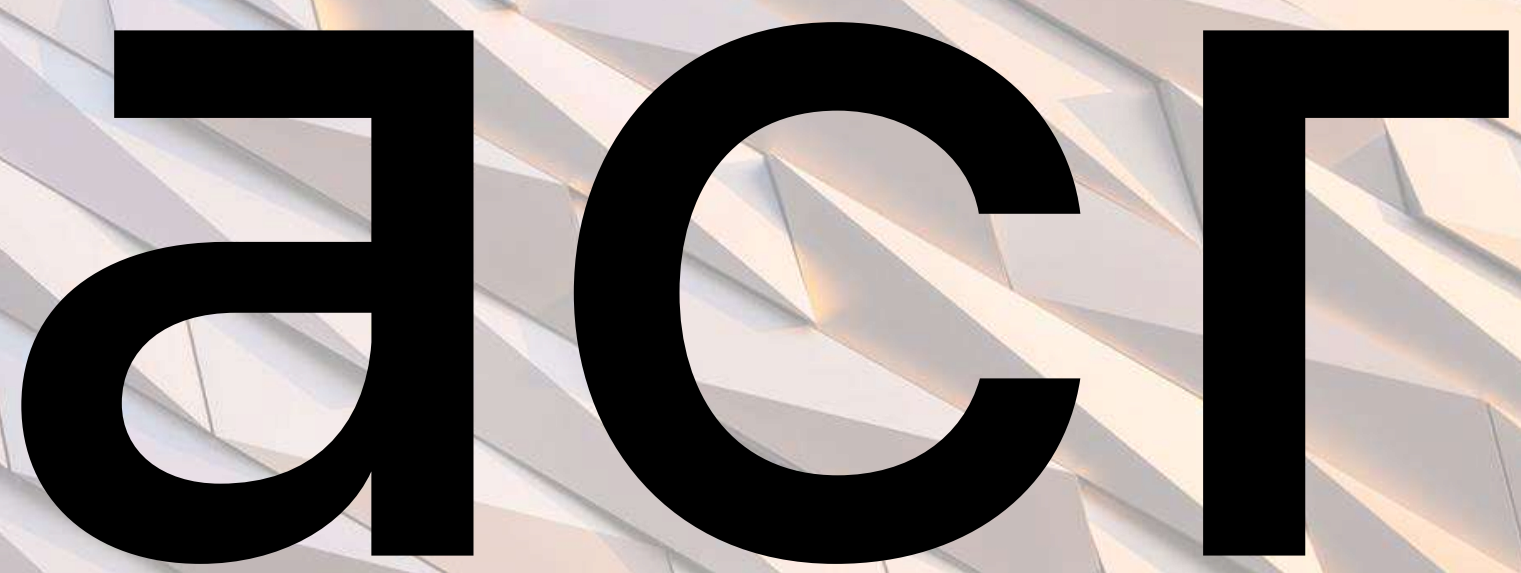
www.drive0.eu

This project has received funding from the European Union's H2020 framework programme for research and innovation under grant agreement no 841850

The information in this publication does not necessarily represent the view of the European Commission.

DRIVE

Construimos pensando
en todo. En todos.



2023

“We want to lead the transformation of the construction sector into an industry. We believe a more sustainable, responsible and innovative sector is possible.”

Who we are, where we are from:

2007

Conclimat Project (2007-2012)

Our first collaborative project focused on energy efficiency.

2010

Acorde Project (2012-2015)

First project on the industrialization of construction when no one was still talking about “industrializing”

2014

Wool4Build Project / FP7 (2014-2017)

WOOL4BUILD

Our first European project focused on the circular economy

2016

iACTIV Project (2016-2018)

Development of an active (and industrialized) façade based on Peltier cells

2018

Beginning of systematic carbon footprint certification (scope 3)

2019

StepUP Project (2019-2024)

Industrialized solutions + LEAN for deep renovation projects.

2020

UXUE Project(2020-2021)

Our first AI-based project

2021

SIADEC Project (2021-2022)

First AI-based project focused on construction sustainability.

2022

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Digitization project based on the CREE solution

2023

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Focus on accelerating deep renovation of EU building stock.

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BuildUPSpeed Project (2021-2022)

Focus on accelerating **deep renovation** of EU building stock.

2023

Who we are:

OUR PRIORITIES

Industrialization

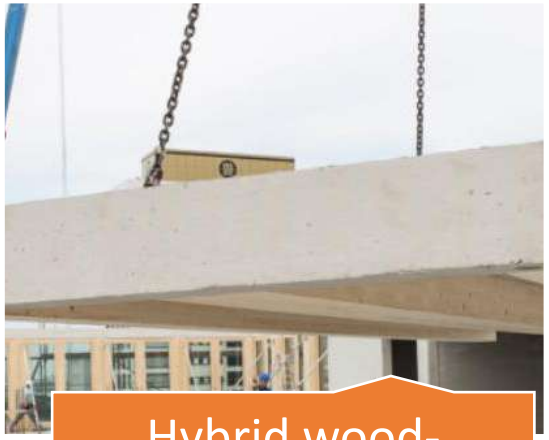
Decarbonation

Circular economy

Artificial Intelligence

What we need to change:

What we are doing now:



Hybrid wood-concrete system

Steel-frame

Precast concrete system

What we are doing now:

acr

What we are doing now:

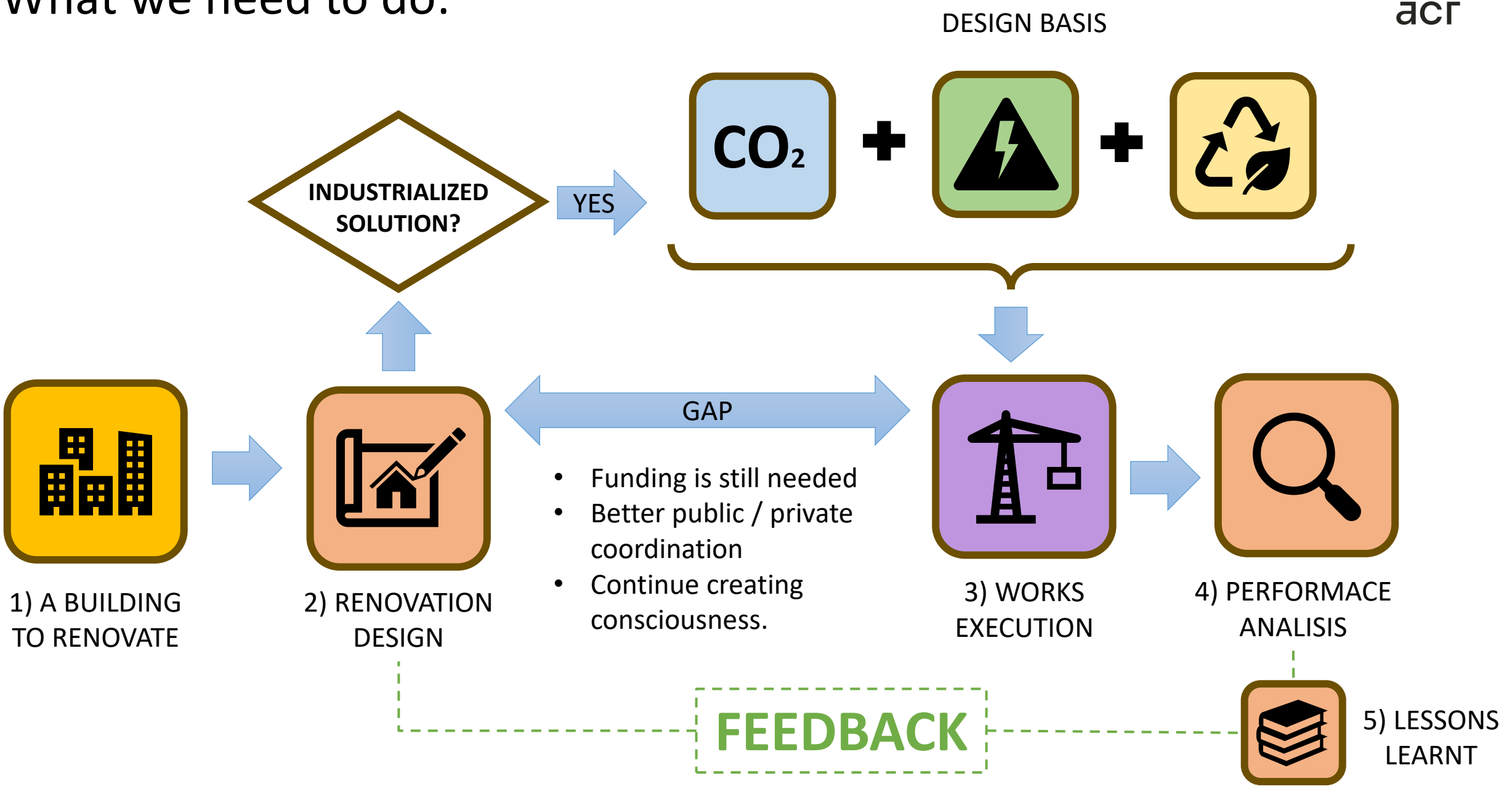
acr

- Industrialization
- Sustainability/ Decarbonation
  - Energy efficiency
  - Circular economy
  - Deep renovation
- Digitalization

StepUP

BuildUPspeed

What we need to do:



Thank you!

acr

2023

BuildUPspeed

Österreichisches Ökologie-Institut

BauKarussell

Employment & Circular Economy

Daniel Orth

Austrian Institute of Ecology / BauKarussell

15.11.2023 – European Committee of the Regions

The BuildUPspeed project has received funding from the LIFE programme of the European Union under Grant Agreement no. 101075843.

BauKarussell

BuildUPspeed

400

Large volume buildings

11 Mio t/a

Construction „waste“

90% of Material

Demolition, reconstruction and renovation

BauKarussell

BuildUPspeed

Connected challenges…

- 35 Milllion buildings to renovate until 2030
- Uncertainties in supply of materials
- Precarity in the secondary labour market
- High environmental footprint of new construction products
- Wasteful deconstruction practice

BauKarussell

BuildUPspeed

…need connected solutions

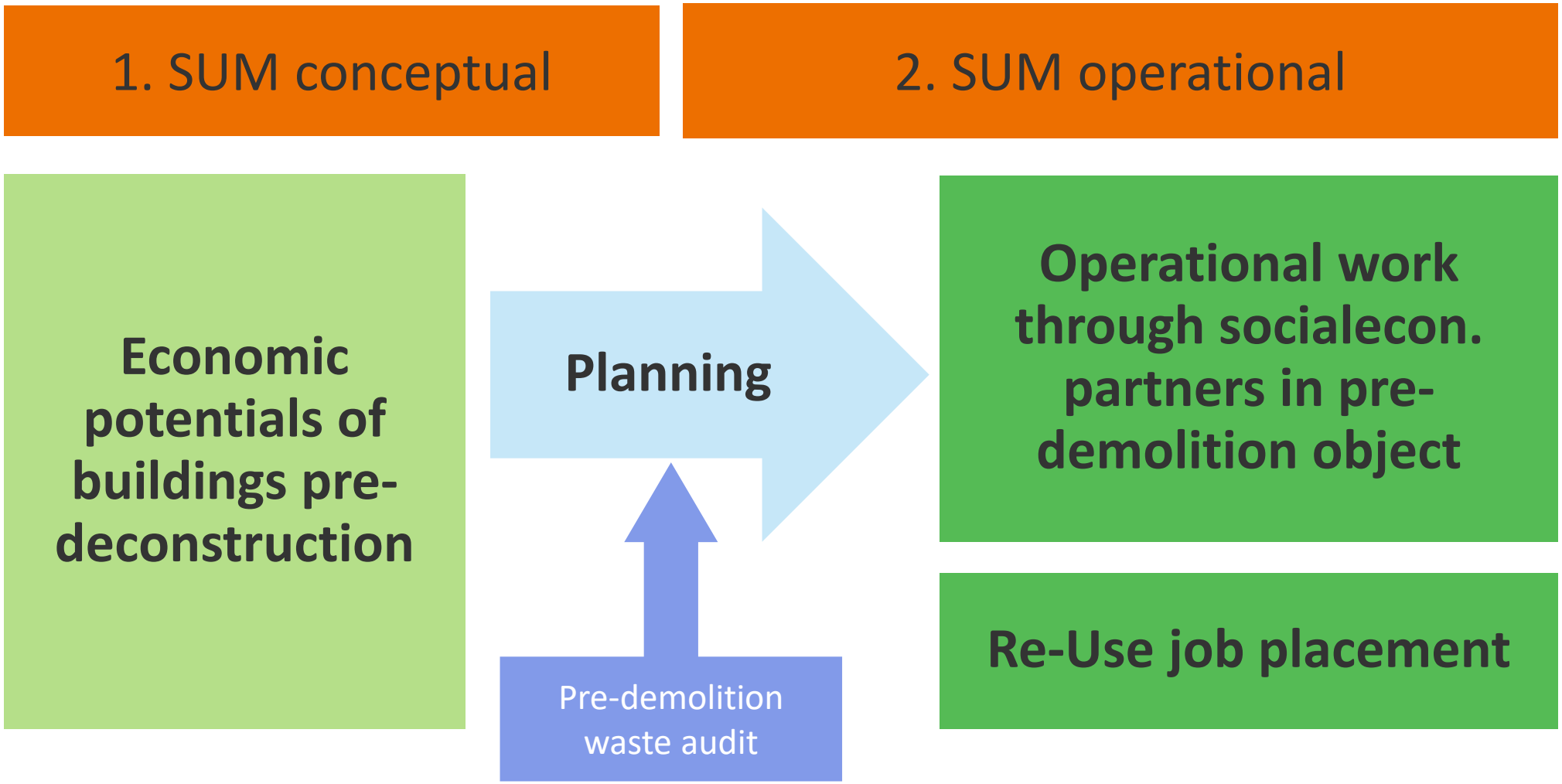
Social Urban Mining

To bring social and economic impact together: Recovery-oriented demolition with social added value

BauKarussell

BuildUPspeed

Social Urban Mining



BauKarussell

BuildUPspeed

Products & services

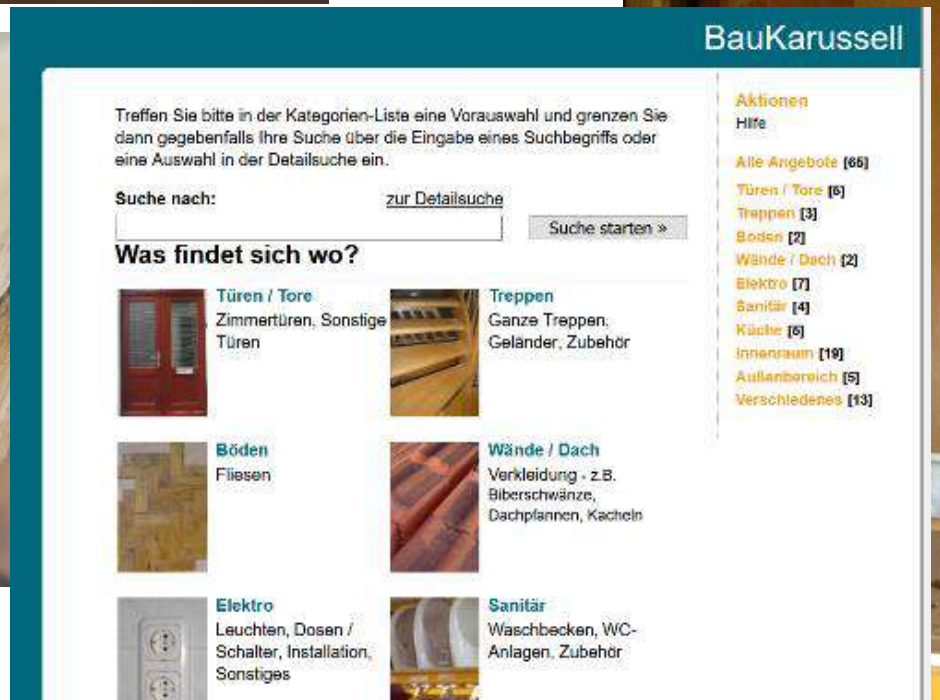
Removing of reuseable objects and recyclable materials

BauKarussell

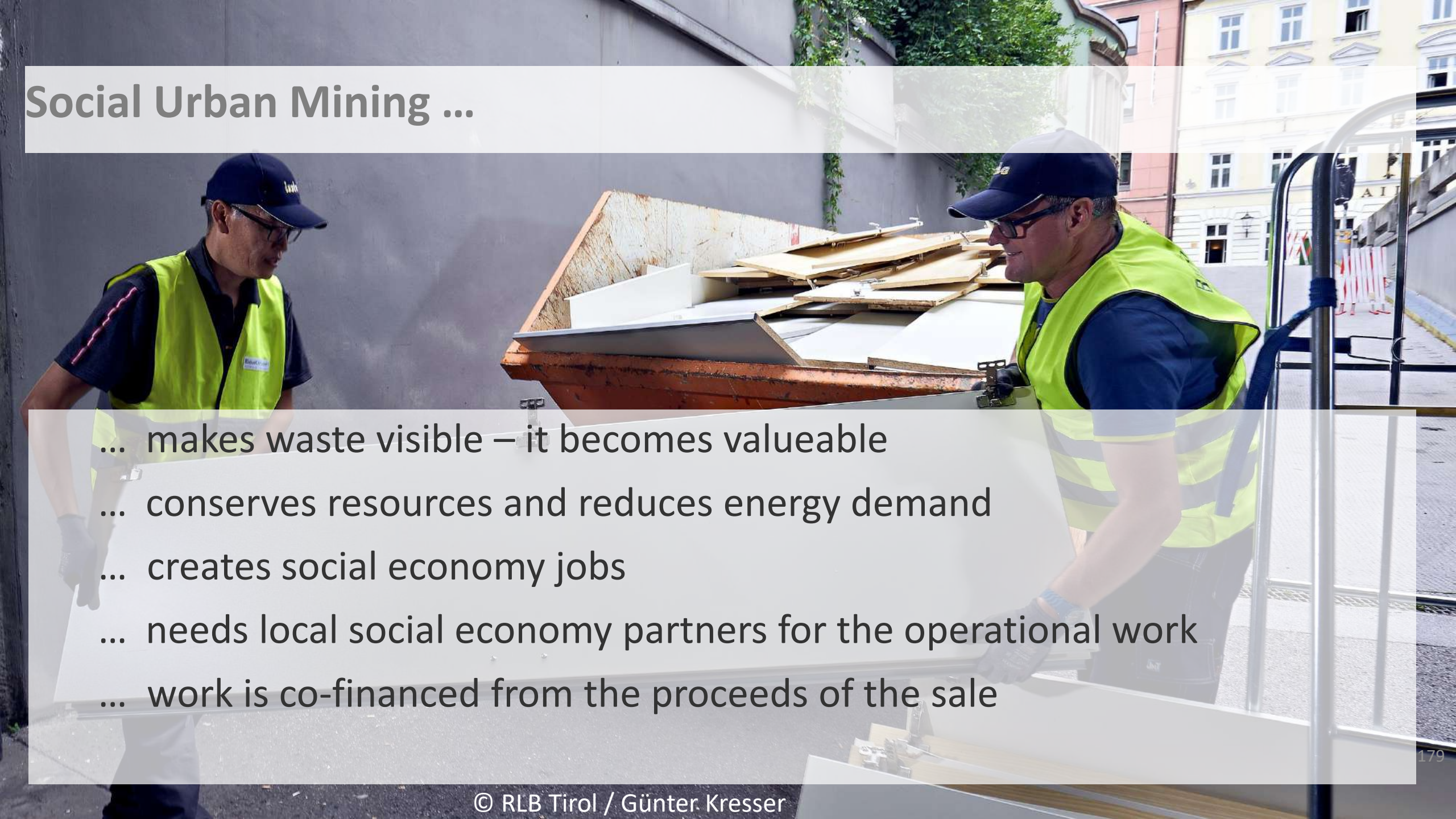
Products & services

sale of
second hand products

BuildUPspeed



Social Urban Mining …



… makes waste visible – it becomes valueable

… conserves resources and reduces energy demand

… creates social economy jobs

… needs local social economy partners for the operational work

… work is co-financed from the proceeds of the sale

BauKarussell

BuildUPspeed

Result since 2016

Extend lifetime of components and materials

Create qualification & employment

Advance the second hand market

1.521 t
Material

36.500 h
Working hours

648 t
Second life products

*status in October 2023

BauKarussell

Beschäftigung & Kreislaufwirtschaft

Acting circular and social today.

Daniel Orth

orth@ecology.at

Österreichisches Ökologie-Institut

https://www.baukarussell.at

Find out more

BuildUPspeed

CIRCULAR MODULAR SOLUTIONS IN MAINSTREAM RETROFIT

Kalle Kuusk

Estonian Business and Innovation Agency

(KredEx and Enterprise Estonia joint organisation)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 841850

Renovation support measures in Estonia

Renovation support measures since 2010

- ≈1400 buildings
- ≈255 mln € for subsidies
- ≈650 mln € total investments

Mainly deep renovation

- Insulation of building envelope
- Replacement of windows
- Renovation of the heating system
- New ventilation system with heat recovery
- PV-panels

On average 50…60% reduction in energy use

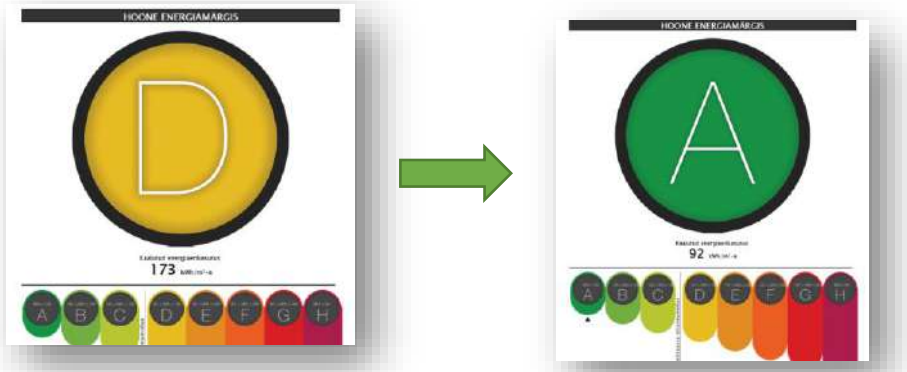
Prefab renovation – first pilots

Renovation of Taltech dormitory - 2018

- **MORE-CONNECT** - prefabricated multifunctional renovation elements
- https://www.more-connect.eu/

Renovation of apartment building - 2021

- **DRIVE 0** – modular circular deep renovation
- https://www.drive0.eu/



Prefab to mainstream retrofit

The market conditions were favorable for innovation:

- Over a decade of experience in deep renovation.
- Well-established renovation market, with participation from apartment associations, designers, and main contractors.
- Existing support measures.
- Many apartment buildings are constructed based on standard designs (scalability)
- Two successful pilot renovation projects (an example of why participation in research and innovation projects is beneficial).
- The strong woodhouse industry.

Challenges that need to be addressed:

- Marketing materials
- Few experienced companies
- Further research and development to address some of the technical challenges.

Mainstreaming prefab renovation – pilot measure

- The budget 18 million euros, support rate 50%
- 19 buildings, 823 apartments, a total net area of 49 360 m^2
- Typical apartment buildings
- Deep renovation with installation of mechanical heat recovery ventilation
- Facade insulation by using prefabricated insulation elements
- Two consortiums of companies
- Average cost was 640 €/m^2

Key selling points

- One-stop shop approach
- KredEx handled the procurements
- One partner for renovation - designer, manufacturer, and main contractor
  - Innovative solution
  - Quality and durability
  - Speed of renovation
  - Less disturbance (no scaffolding)
  - Clean construction site

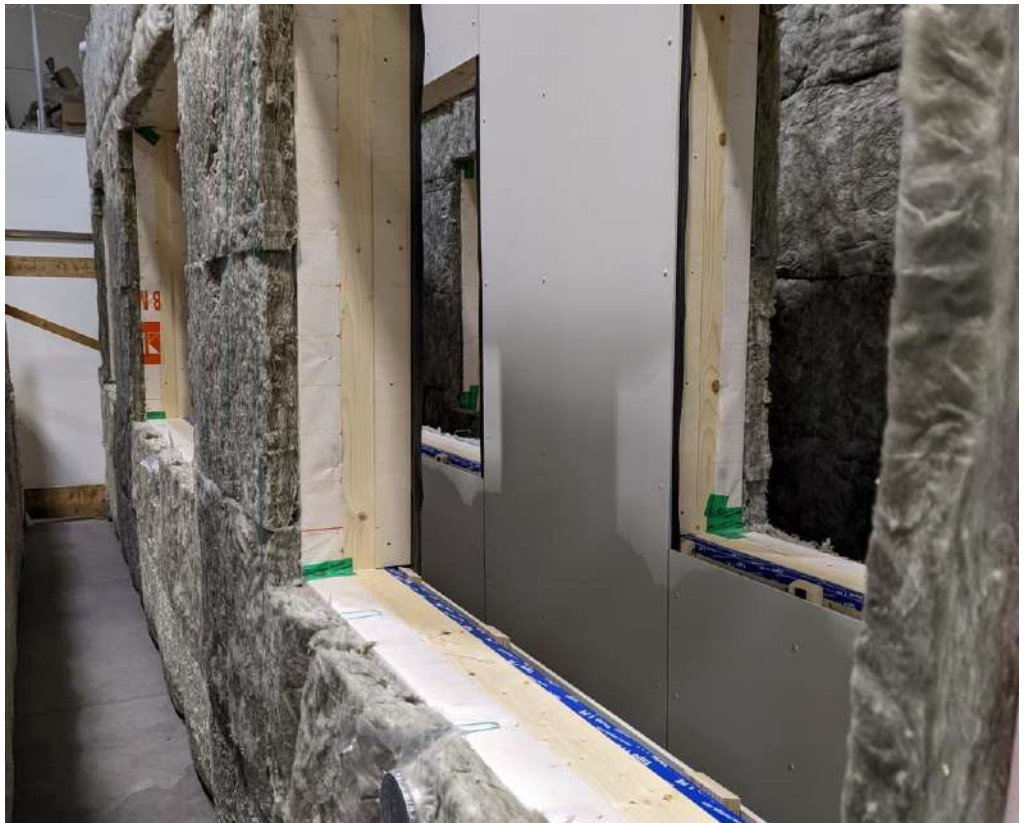
Ongoing renovations

Ongoing renovations







Conclusions and future plans

In summary

- The main obstacles are not related to technical issues.
- The public sector can accelerate the process by taking the lead.
- Having the support of major companies or industry associations is crucial.
- When companies see a business case, they are more likely to follow.
- To make a business case, it is essential that the product is financially feasible for homeowners.

Plans for prefab renovation

- There were 19 buildings included in the dedicated program for renovating with prefabricated elements.
- Prefab renovation will now be included in the state's renovation subsidy program, with a specific budget allocated to scale up the process.

Additional information

Grant for prefab renovation

- https://www.kredex.ee/en/element

Animations and videos

- https://www.youtube.com/watch?v=USTB3u1WnEI&ab_channel=WoodhouseEstonia
- https://www.youtube.com/watch?v=TX0k50oSuJU&ab_channel=WoodhouseEstonia
- https://www.youtube.com/watch?v=XOeTnDXHCuk&ab_channel=TimbecoWoodhouse

Thank you for your attention!

kalle.kuusk@kredex.ee

COLOFON:

www.drive0.eu

This project has received funding from the European Union's H2020 framework programme for research and innovation under grant agreement no 841850

The information in this publication does not necessarily represent the view of the European Commission.

pichinnovation

Success stories in implementing sustainable approaches & innovative solutions within commercial operations

DRIVE 0 FINAL SYMPOSIUM AND CLUSTERING WORKSHOP

15TH November 2023, Brussels

PICHINNOVATION

From picharchitects PICH-AGUILERA, with 35 years of experience in the construction sector, applying sustainability, industrialization and technological innovation in our projects, we launched pichinnovation, with a team of architects and researchers dedicated to innovating in construction products and systems, and with experienced advisers in both technical and commercial matters.

ARCHITECTURE, DESIGN, INNOVATION










OUR PURPOSE

- Mission: Within the framework of the circular economy, develop innovative, prefabricated, dismountable and low environmental impact products and construction systems for manufacturers. Monitor the applicability of these products and systems in the market and ensure their first application in a studio project.

- Vision: Act as an R+D+i department for our client to improve its environmental impacts and its efficiency, by introducing new construction systems to the market.

VALUE PROPOSAL

Constant connection with sustainability and the environment. Technical and environmental rigor

Close and direct collaboration with the industrial partner.

Knowledge and credibility in the sector. Long career as architects.

Professionalism and know-how in construction systems for building.

International focus, local knowledge.

Integration and knowledge of the requirements of technical regulations.

EXECUTIVE TEAM

ZUZANA PROCHAZKOVA

Chief Innovation Architect

- **Experience:** Responsible for the R+D+i Dept. of Pich Architects since 2017. Development of construction systems. BIM tools. Circular economy and business models. Repairability and disassembly.
- **Education:** Architect, PhD candidate in Circular Economy applied to construction. UIC, Barcelona

GUZIDE ASLANKAYA

Innovation Architect, principal researcher

- **Experience:** Market analysis and development of research projects. Lighting simulations. Life cycle assessment. Restoration, Historic Structures, Material Science, Wood Systems.
- **Education:** Architecture, Doctorate in Wood Structures and the response of joints to the earthquake. UPC, Barcelona

LETIANE BENINCA

Innovation Architect, business development

- **Experience:** Energy efficiency and automation of parameterization in architecture. Thermo-energetic simulations. Collaborative project management. Bioclimatic architecture.
- **Education:** Engineering and architecture. PhD student in Energy Efficiency in buildings. UPC, Barcelona

ADVISORY TEAM

TERESA BATLLE

Networking Advisor

- **Experience:** Co-founder of PichArchitects. Promotion and monitoring of R+D+i projects. Collaboration with universities and technology centers. President of the ASA Scientific Committee.
- **Education:** Architecture.

JOAN MARIA FREIXES

Financial Advisor

- **Experience:** Managing director of the PichArchitects. Director of the office branch in Mexico. Administrative and human resources management.
- **Education:** Architecture, business management.

FELIPE PICH-AGUILERA

Technical Quality Advisor

- **Experience:** Co-founder of PichArchitects. Executive director of architecture and construction innovation projects. Professor at UIC Barcelona, School of architecture.
- **Education:** Architecture, Doctorate in architecture.

JOSEP TORRES RIBAS

Senior Commercial Advisor

- **Experience:** Professional career in General Management Company with a focus on Commercial/Marketing/Communication areas.
- **Education:** Engineering and Economics.

SERVICES

ANALYTICS

- Analysis of **innovation opportunities**
- Analysis of application and potential of the **circular economy**
- Comparative **market** analysis
- **Life cycle analysis** at the construction system level

INNOVATION

- Of **product**
- Of construction **system**
- Of production/assembly **processes**
- **Business model**
- Accompaniment in the **commercial** launch

WHO IS OUR POTENTIAL CUSTOMER?

- **Manufacturer** of construction materials or systems
- Company with an **interest in innovation**, circular economy and industrialization
- Manufacturer without internal R+D+i Department or with complementary R+D+i

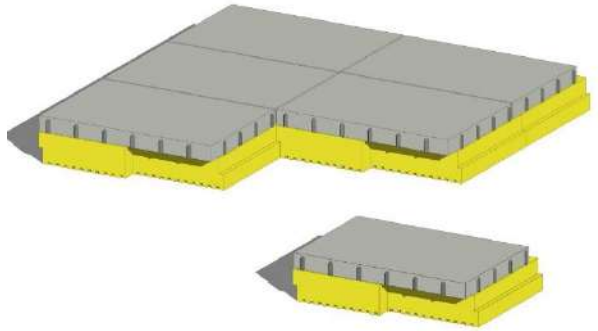
WHAT IS THE DNA OF OUR PRODUCT?

- **Innovative** (disruptive / improvement)
- **Sustainable**, removable and easy to maintain
- Based on the knowledge of the work and the **market**
- economically viable, **marketable**



3 CASES OF COLLABORATION WITH INDUSTRY

Pilot project:
Residential building Neinor Pintor y Alsamora · Barcelona



Development of **an integrated flooring system for inverted walkable roofs**, with the aim of incorporating an industrialized concept and optimizing its manufacturing and installation performance.

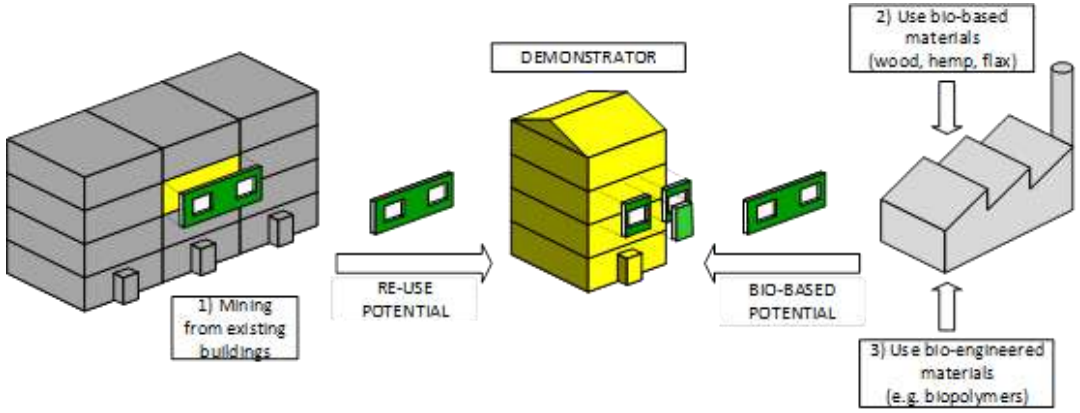
Pilot project:
Wellness Hub · Monterrey, Mexico

Development of a **bioclimatic prefabricated façade panel**, with a layer of porous concrete providing evaporative cooling. Based on collaboration between **architecture + industry + university**.


kinetica

DRIVE

DRIVE0. *European Commission.* 2019-2023.

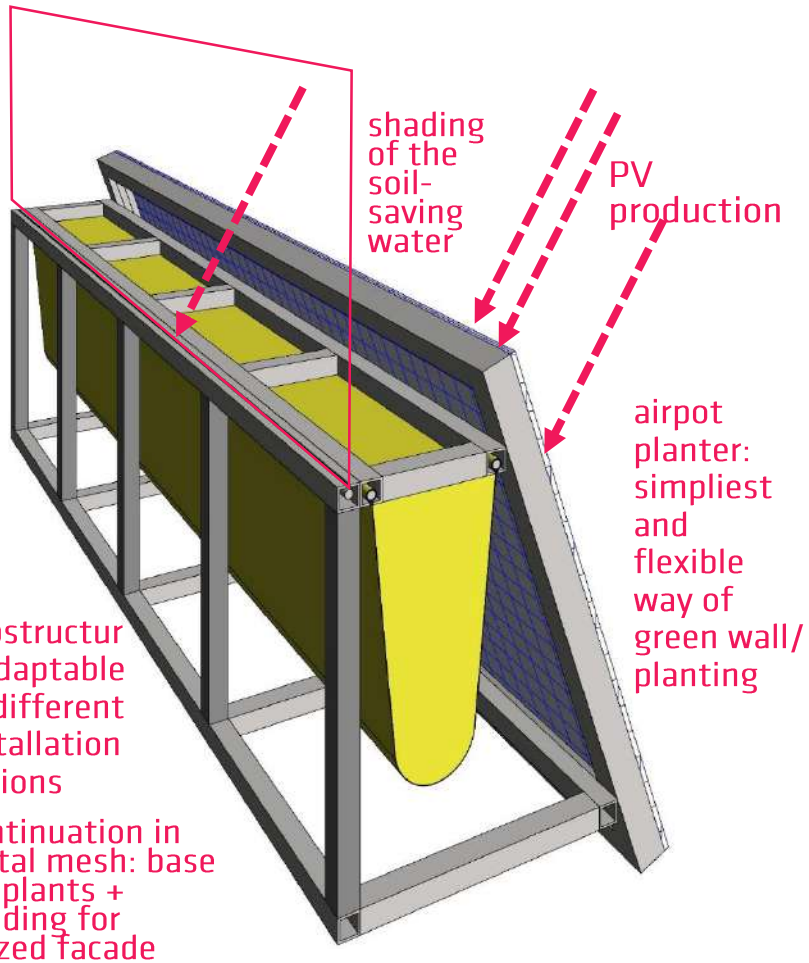


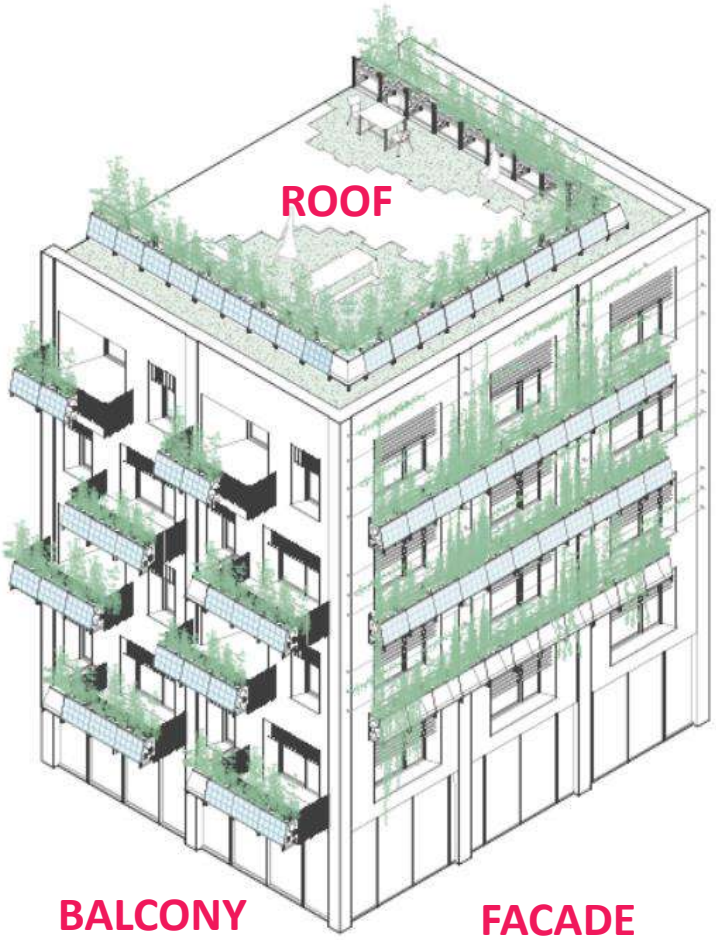
DRIVE0 is a concept of application of circular economy based on local impulses, in the case of Barcelona, it is the renovation of party walls of houses with a façade system with renewable energy production and integration of green.

DRIVE

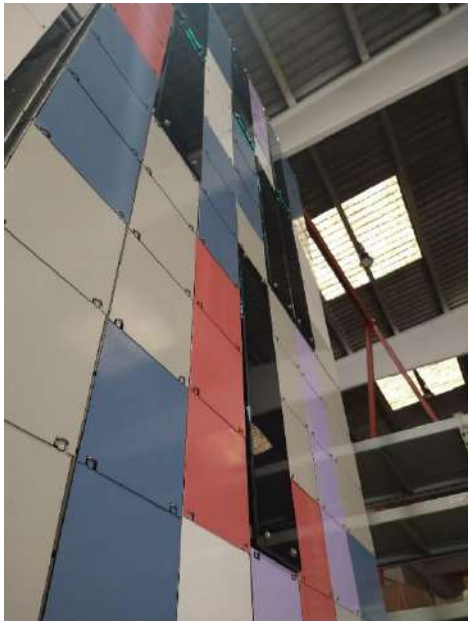
DRIVE0. *European Commission.* 2019-2023.

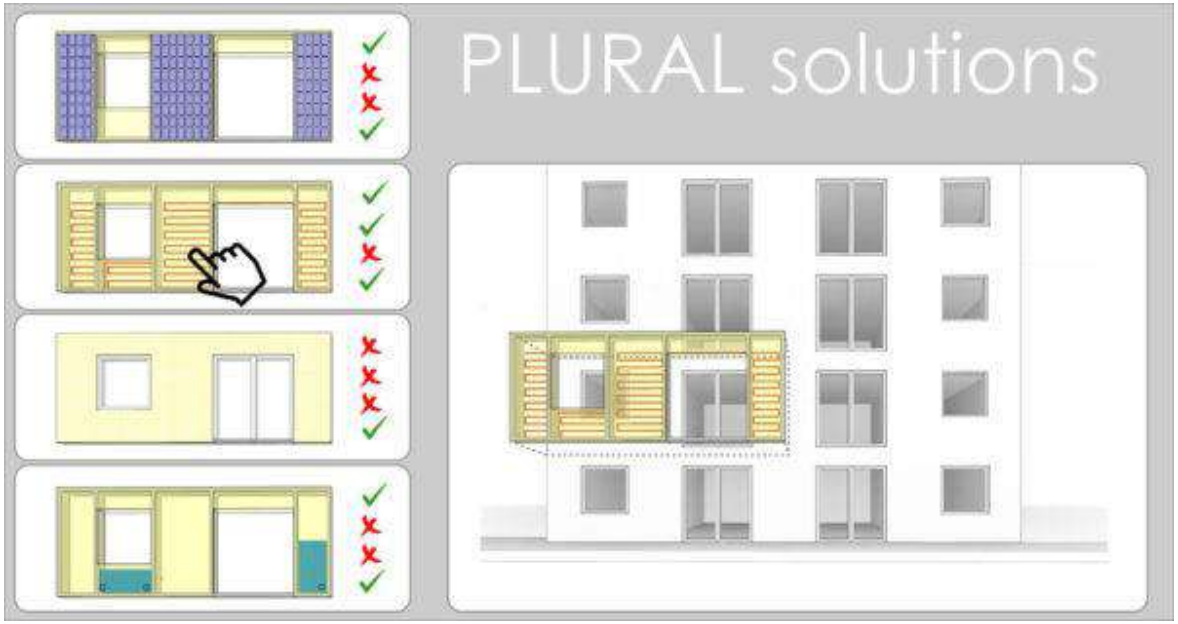
VERTICAL urban biotechnology





PLURAL. ***European Commission.*** **2020-2024.**





Development of a prefabricated façade system for housing rehabilitation with the integration of technologies such as photovoltaic, ventilation unit, solar protection and window, all in the same panel.

pichinnovation

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Final conclusions

Drive 0 Final Symposium and EU Clustering Workshop

Thank you for joining us today!

www.drive0.eu

Drive 0 Final Symposium and EU Clustering Workshop

Drive 0 Final Symposium and Clustering Workshop - Fostering experiences from EU innovation projects to accelerate a sustainable built environment - 15 November 2023, Brussels (Belgium). The **Drive 0** project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 841850.The **StepUP** project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 847053. The **PLURAL** project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 958218. The **INFINITE** project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 958397. The **BuildUPspeed** project has received funding from the LIFE programme of the European Union under Grant Agreement no. 101075843. The **Giga Regio Factory** project has received funding from the LIFE programme of the European Union under Grant Agreement no. 101077258.