‘Superlocal’ towards a circulair built environment

– the Phoenix perspective –

Built Environment

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‘Superlocal’ towards a circulair built environment – the Phoenix perspective –

Course “Tools for Urban Recovery”

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June 5, 2023

Program:

18.00-18.15u: Introduction by prof. Nurhan Abujidi

18.15-18.45u: Keynote by J. van Oorschot Phd. MSc.

18.45-18.55u: Introduction break-out session

18.55-19.15u: Break-out session

19.15-19.25u: Plenary closure

19.25-19.30u: Final comments by Roman Punchko, founder of Rethink Ukraine


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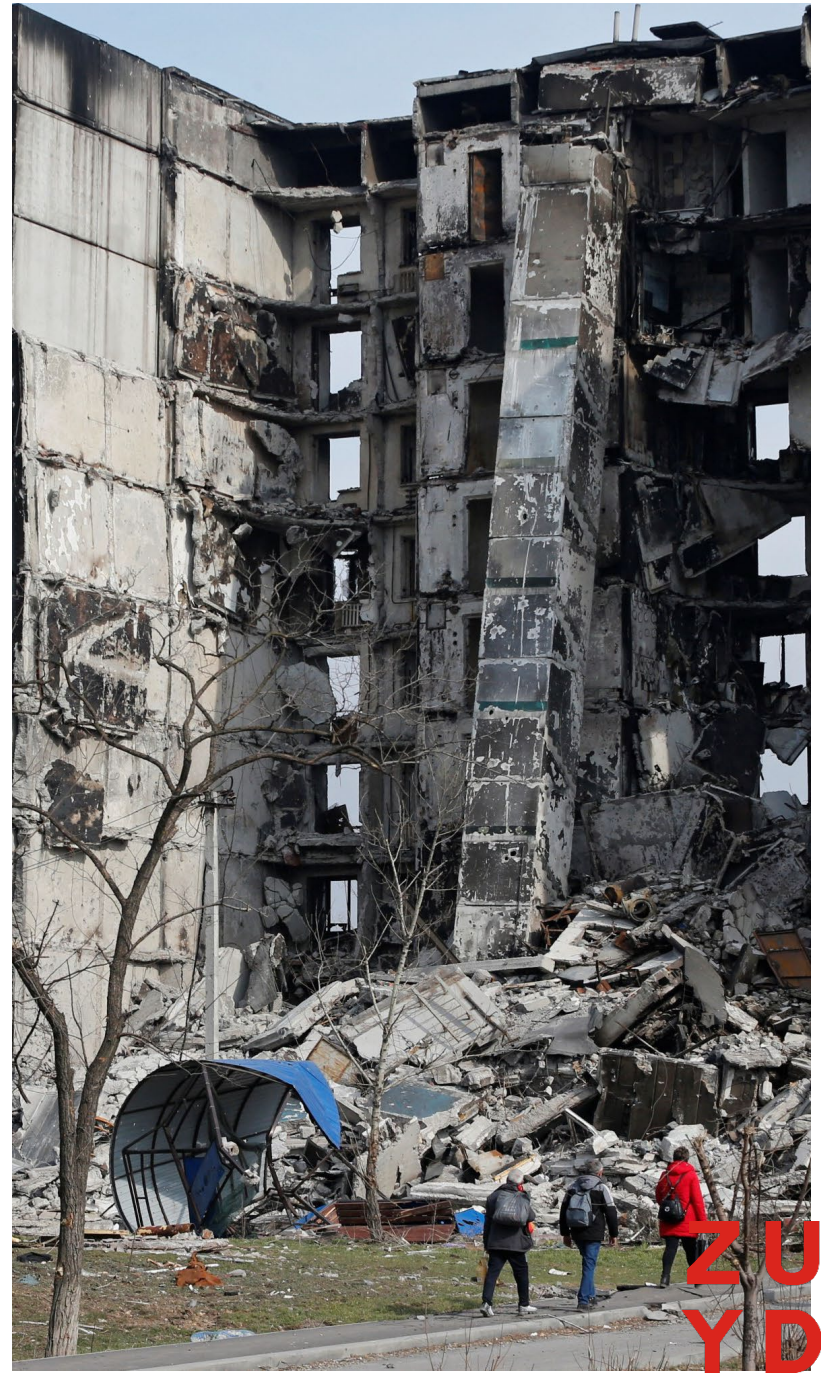
VERHEIST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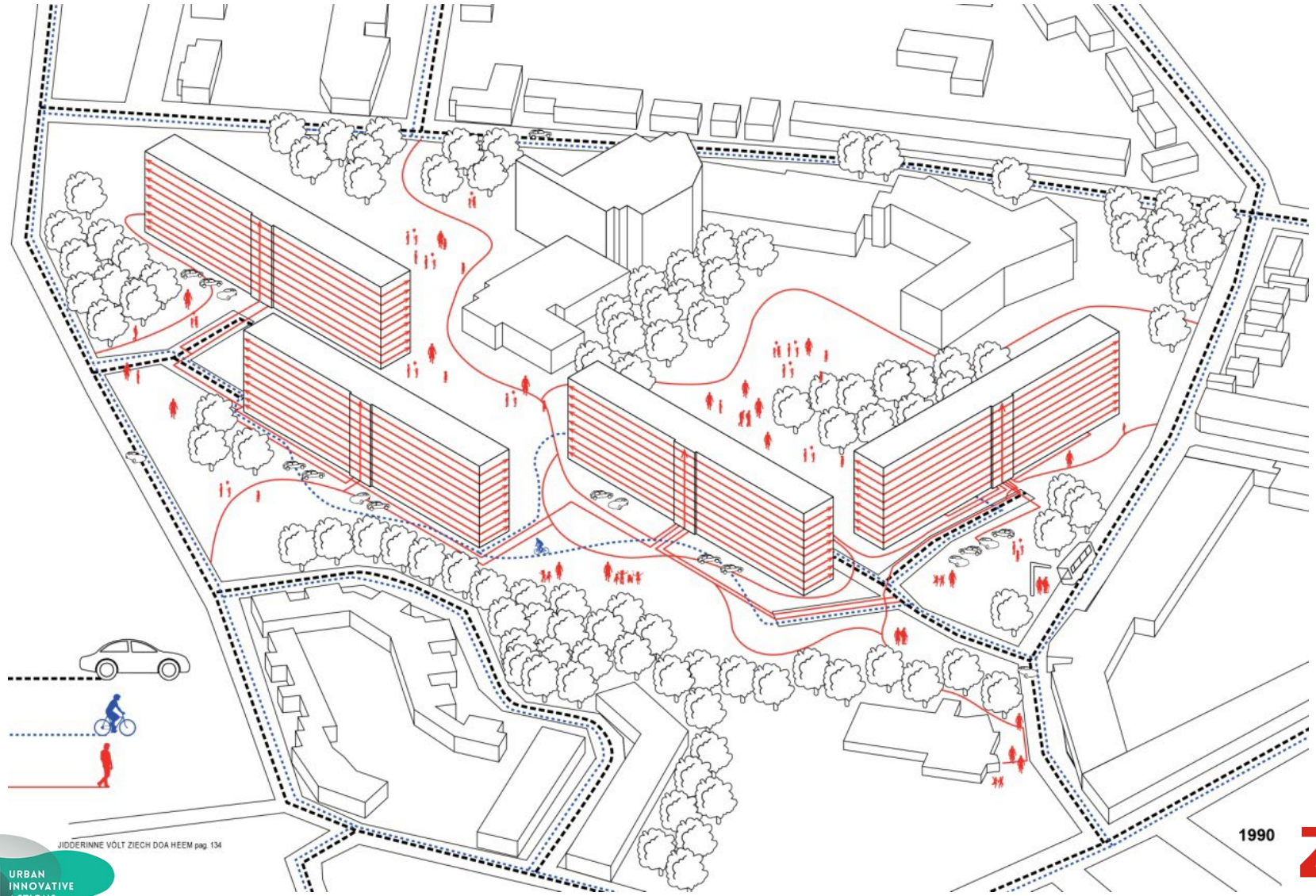
Highrise buildings

1967-1990

- Housing shortage
- High social cohesion
- ‘Street-feeling’ on galleries



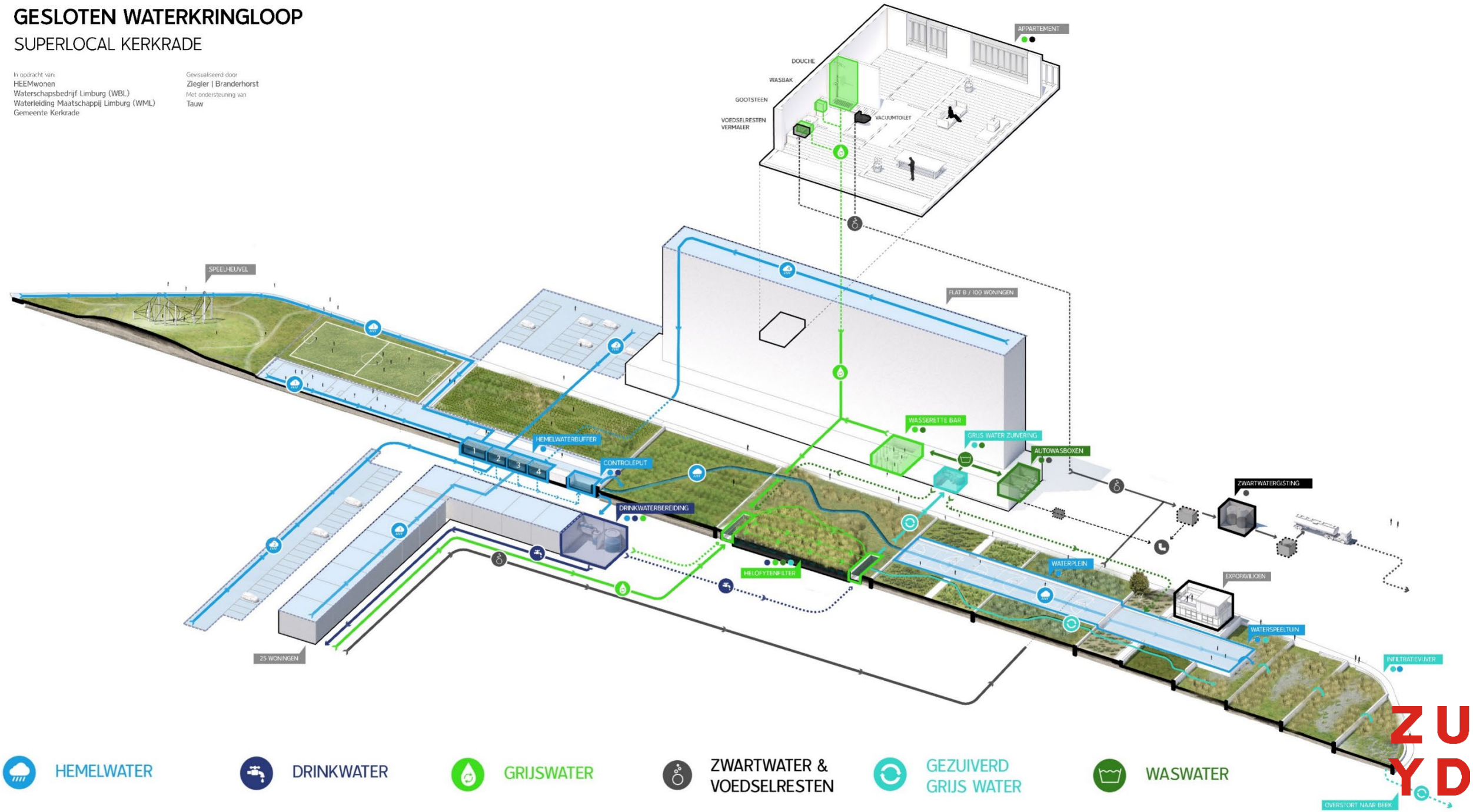

SCAN ME

GESLOTEN WATERKRINGLOOP

SUPERLOCAL KERKRADE

In opdracht van:
HEEMwonen
Waterschapsbedrijf Limburg (WBL)
Waterleiding Maatschappij Limburg (WML)
Gemeente Kerkrade

Gevisualiseerd door
Ziegler | Branderhorst
Met ondersteuning van
Tauw

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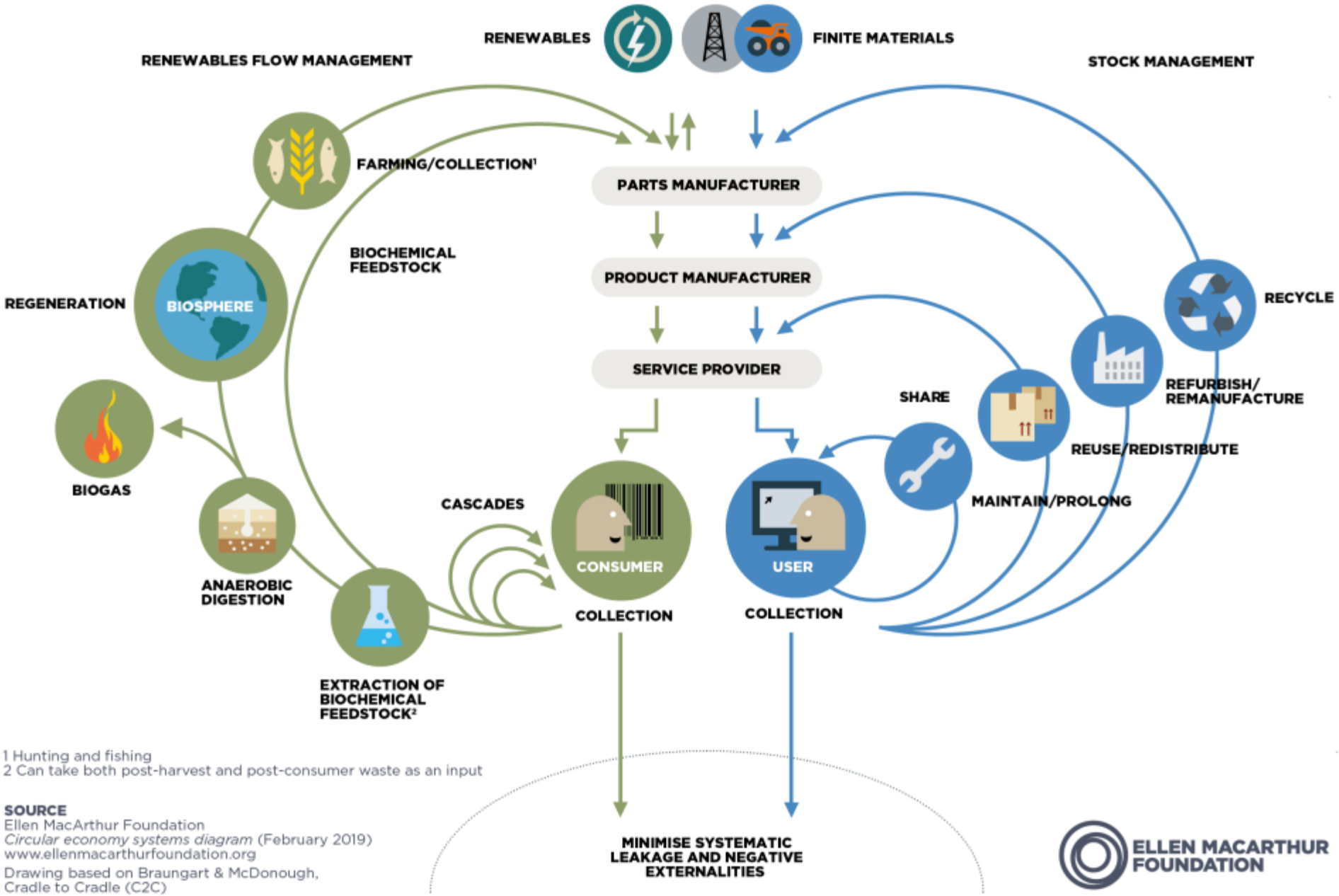
The EMF defines the circular economy as (EMF, 2015):

"Restorative by design and aims to keep products, components, and materials at their highest utility and value at all times, distinguishing between technical and biological cycles"

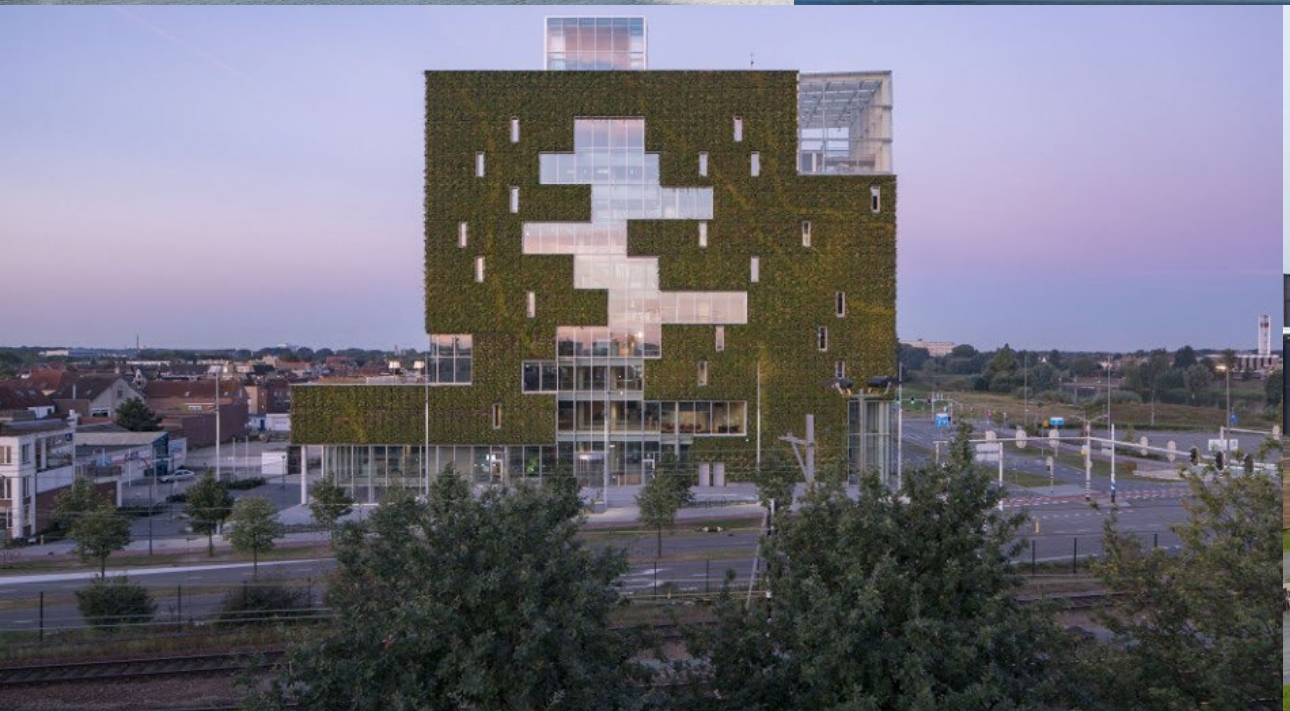


https://ellenmacarthurfoundation.org/circular-economy-diagram

A circular building is (Ritzen, 2017):

1. All materials are part of a closed cycle at their highest utility and value:
    1. Technical
    2. Biological
2. Based on 100% renewable energy over its complete life-cycle

However...

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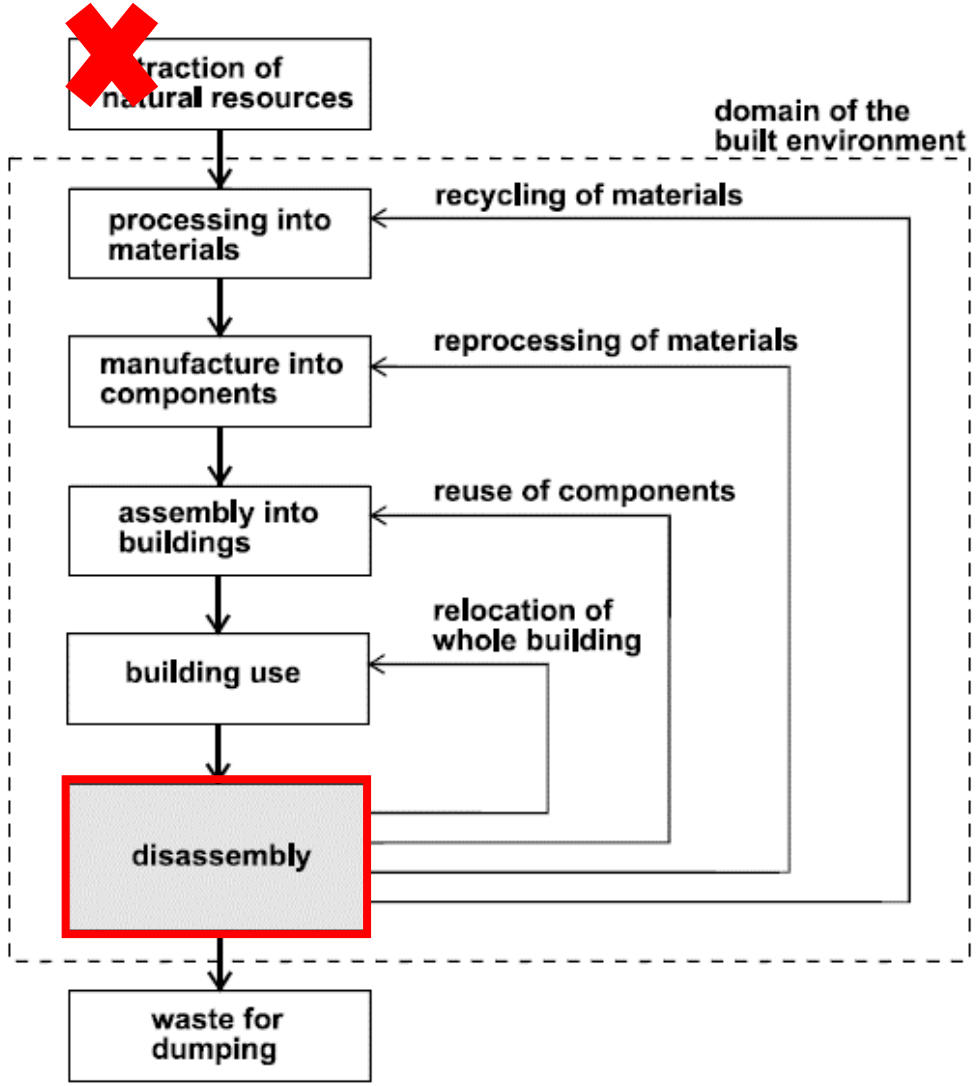

Deconstruction and Materials Reuse: Technology, Economic, and Policy. CIB Publication 266, 2001

Re-use

Re-use

Re-proces

Re-cycle

Re-cycle

Trial

Experiment

Demonstration

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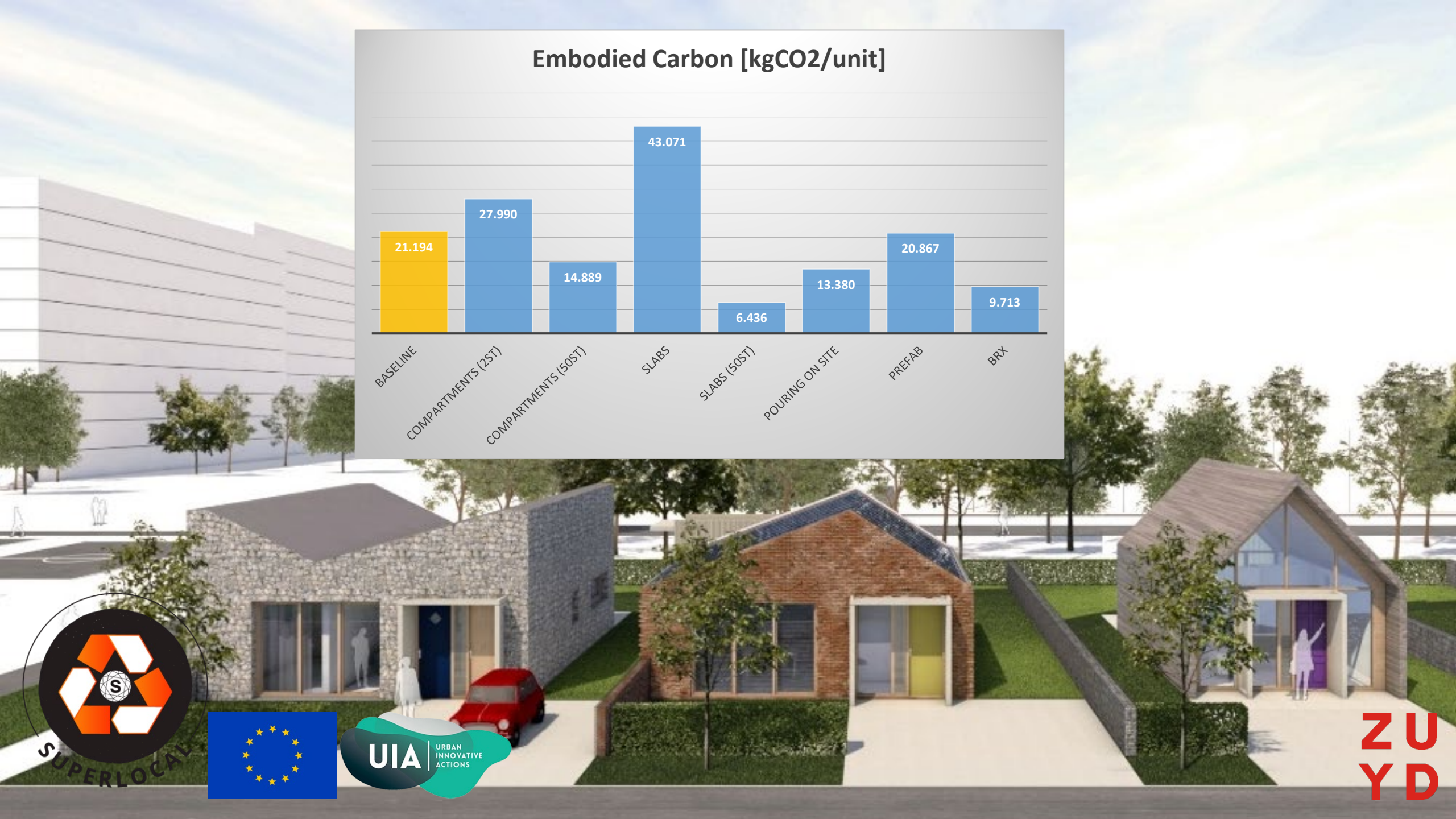
RE-USE

See also YouTube channel: [(93) SUPERLOCAL HEEMwonen - YouTube]

RE-CYCLE


Embodied Carbon [kgCO2/unit]
21.194
27.990
14.889
43.071
6.436
13.380
20.867
9.713
BASELINE
COMPARTMENTS (2ST)
COMPARTMENTS (5OST)
SLABS
SLABS (5OST)
POURING ON SITE
PREFAB
BRX
SUPERLOCAL
UIA
URBAN INNOVATIVE ACTIONS
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Investment cost casco
€ 100.000,00
€ 90.000,00
€ 80.000,00
€ 70.000,00
€ 60.000,00
€ 50.000,00
€ 40.000,00
€ 30.000,00
€ 20.000,00
€ 10.000,00
€ -
Cost
Baseline prefab traditional
Compartments type A (1 unit)
Compartments type B (1 unit)
Compartments 20 units
Pouring on site
Prefab circulair
On-site activitities
€ 8.000,00
€ 45.738,00
€ 34.562,00
€ 40.000,00
€ 53.408,00
€ 8.000,00
Acquiring casco
€ 17.000,00
€ 41.515,00
€ 41.515,00
€ 20.000,00
€ -
€ 20.400,00
Concrete scenario's
€125,000,-
€125,000,-
€115,000,-
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SUPERLOCAL
UIA
URBAN INNOVATIVE ACTIONS
Type A
Type B
Type C
€267,789
€125,000
€254,755
€125,000
€211,873
€115,000

Key take aways from the Superlocal project

- ***Minor reduction on embodied carbon emission*** compared to 'baseline' linear construction
- However, ***3-4 times more expensive*** to harvest materials and re-use (high quality assessment costs, high labour costs, high repair costs) relative to tradition construction practices
- Starting from harvesting materials from tunnel formed concrete structures (from 1960-70s), economically **most promising** scenario:
  - ***Prefabricated and re-usable slabs with 100% coarse aggregates*** from granulated concrete (recycling)
  - ***20% more costly*** compared to traditional construction practices (however, some cost aspects are not well addressed as reclaim value, shadow costs, economies of scale)

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Recovery program NL after WWII

- ‘Housing shortage public enemy number one’ – strict regulation by Dutch government sustained by the Marshal Plan (1948-1952)…but not priority number one
- Strong social support and commitment in the NL: Utopia
- Governmental support program 1945-1965-70 led to the construction of 1,5 million affordable housing units [7,5 million housing units anno 2023]
- Shortage of financial resources, building materials, equipment and labor force
- ‘Recovery architecture’, such as typical Dutch terraced housing (in Dutch: Doorzonwoning, Duplex woning, Wederopbouwboerderij)
- Impact on construction practices: boost of industrial house building systems resulted in the construction of 400-450.000 housing units

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1945 Woningnood: volksvijand nummer 1 - Canon Volkshuisvesting Nederland, Details (canonsociaalwerk.eu)

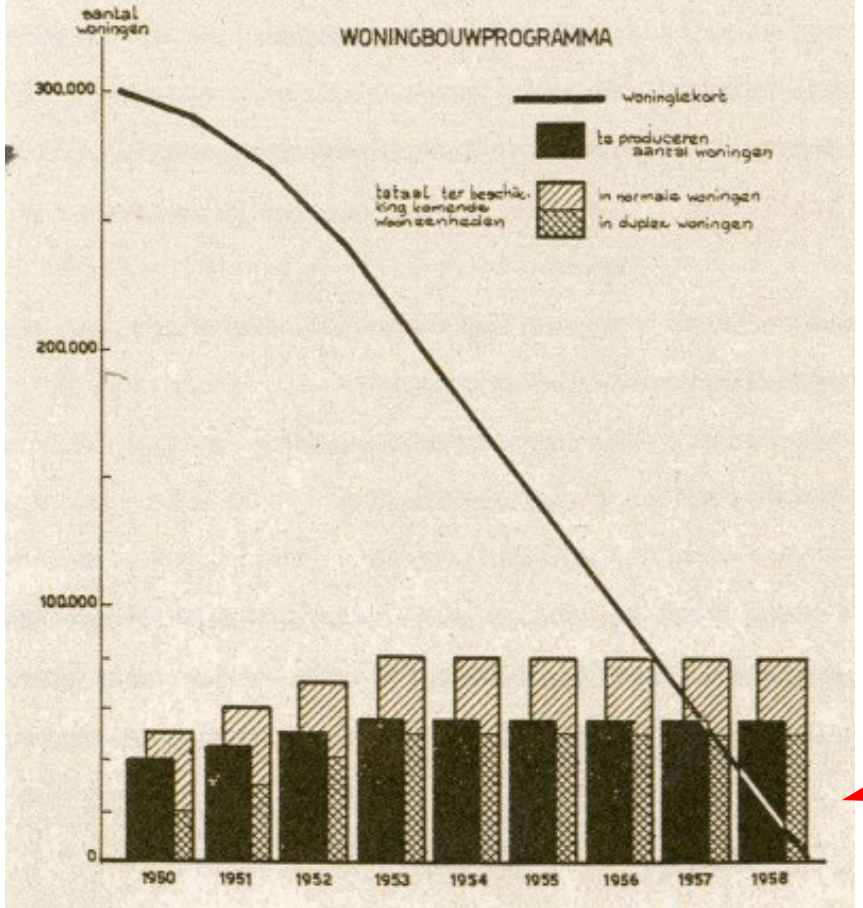
WONINGEN *)	I Verwoest		II Zwaar besch.		III Licht besch.		Totaal	
	82.561	(3.75%)	38.684	(1.76%)	388.299	(17.62%)	509.544	(23.12%)

Verdeling over de provincies:

	Woningvoorraad 1.5.1940	Verwoest I	%	Zw. besch. II	%	Licht besch. III	%
Groningen	110.652	856	0,77	832	0,75	15041	13,59
Friesland	113.901	320	0,28	230	0,20	4000	3,51
Drente	55.963	254	0,45	68	0,12	5969	10,66
Overijssel	133.454	2769	2,07	1379	1,03	26951	20,19
Gelderland	213.664	11323	5,30	11349	5,32	82684	38,70
Utrecht	120.155	1430	1,19	679	0,57	10040	8,35
N.-Holland	460.353	12440	2,70	1689	0,37	27703	6,02
Z.-Holland	588.080	39327	6,69	3143	0,53	58478	9,94
Zeeland	70.085	5957	8,50	5669	8,09	31686	45,21
N.-Brabant	213.646	5795	2,71	7627	3,57	79196	37,07
Limburg	123.874	2090	1,69	6019	4,86	46551	37,58
Totaal	2.203.827	82561	3,75	38684	1,76	388299	17,62

[1945 Woningnood: volksvijand nummer 1 - Canon Volkshuisvesting Nederland, Details (canonsociaalwerk.eu)]

Jaar	Productie	waarvan duplexwon.	Aantal wooneenh.	Normale behoefte	Tekort
					300.000
1950	40.000	10.000	50.000	40.000	290.000
1951	45.000	15.000	60.000	40.000	270.000
1952	50.000	20.000	70.000	40.000	240.000
1953	55.000	25.000	80.000	40.000	200.000
1954	55.000	25.000	80.000	40.000	160.000
1955	55.000	25.000	80.000	40.000	120.000
1956	55.000	25.000	80.000	40.000	80.000
1957	55.000	25.000	80.000	40.000	40.000
1958	55.000	25.000	80.000	40.000	—
	465.000	195.000	660.000	360.000	



Urban planning: location, housing type, number, workforce

[Wederopbouw architectuur - Erfgoedhuis Zuid-Holland (geschiedenisvanzuidholland.nl)]

Recovery program NL after WWII…legacy..

- Poor quality, high maintenance costs (quantity over quality policy)
- Low energy efficiency
- One-type-fits-all housing inflexible in use to accommodate various target groups
- Not suitable for accommodating the elderly and disabled
- Voice of the customer completely discarded
- Significant consumption of natural resources
- Significant deposition of pollutants including GHG
- Substantial demolition waste streams
- …

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Based on lessons from the past…where to start?

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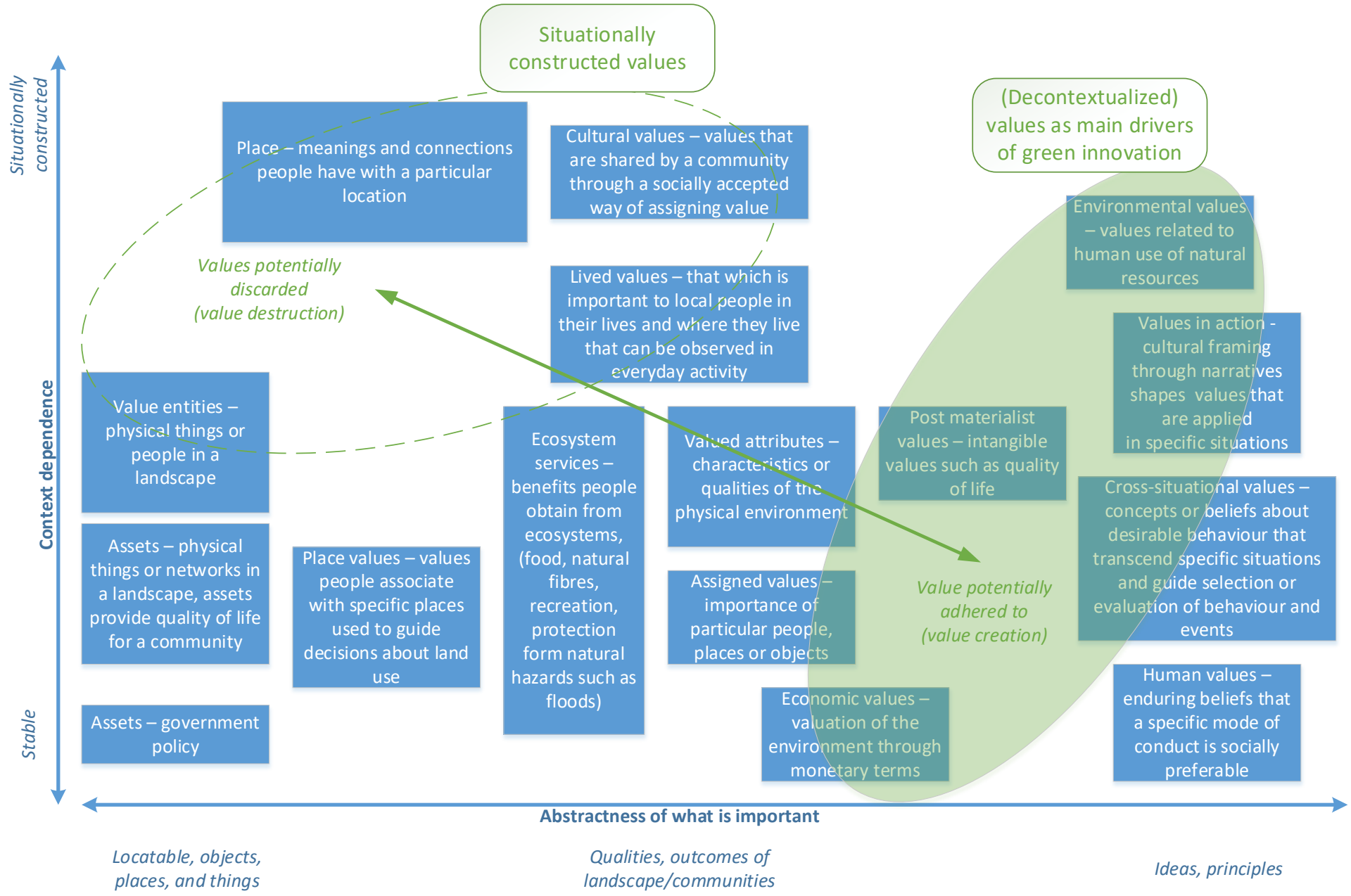
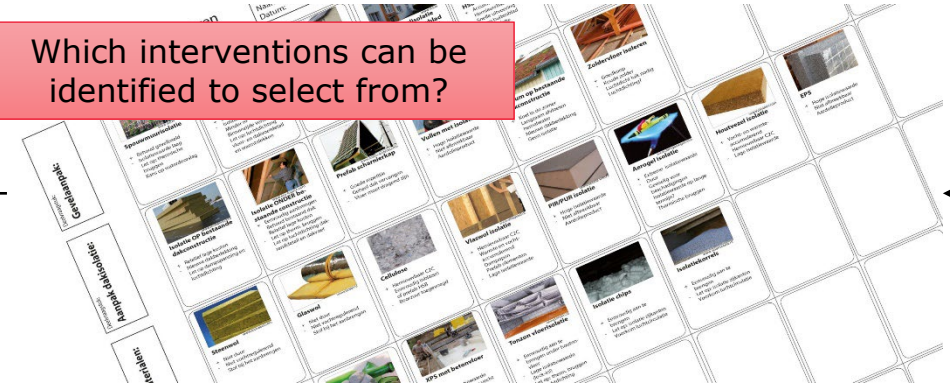
Mapping value



Adapted from Rawluk et al. (2019)

Mapping value

Which interventions can be identified to select from?



Value creation & destruction

Resource loops

Which kind of values are created and/or destroyed when urban transformation interventions are implemented?

Relevant RQs (Rawluk et al., 2019):

1) If these values are important, to what tangible 'things' [deep-renovation interventions] are they related (and visa versa)?
2) What is valued that can be generalised to other context reflecting the re-use potential of the deep-renovation intervention?

In terms of urban transformation, what are the needs and ambitions at the urban pixel | neighbourhood | city | regional level?

Which local resources can be identified to be retained for the urban transformation goals at the urban pixel | neighbourhood | city | regional level?

Adapted from Leclercq and Smit (2021)

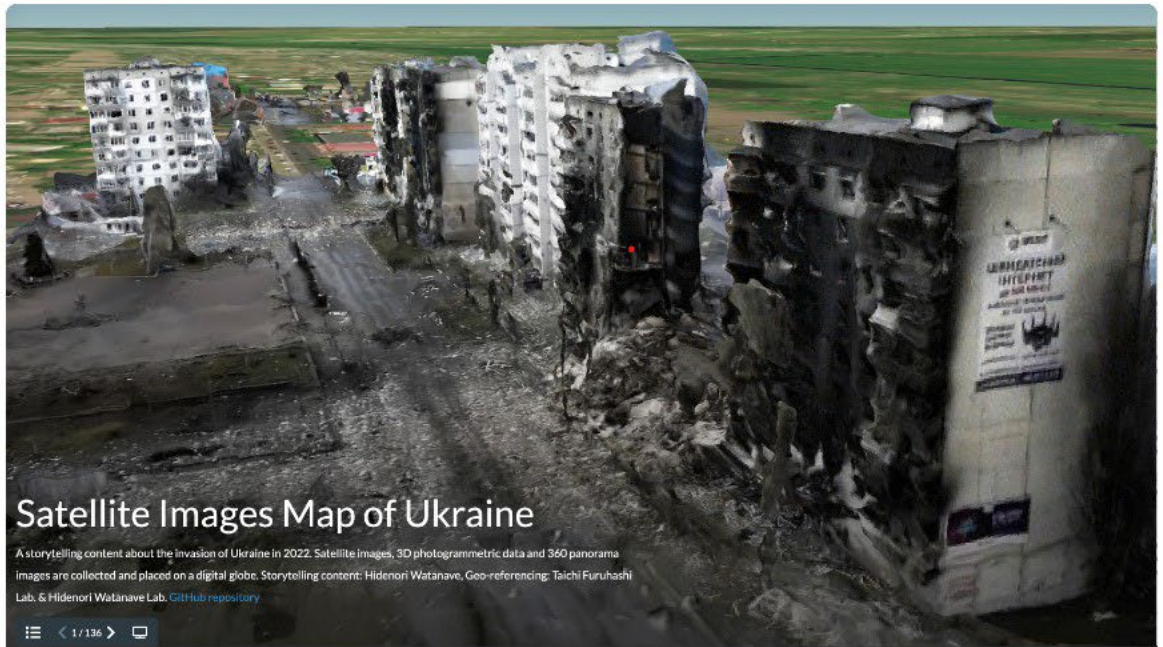
Satellite mapping project tracks damage to Ukrainian communities

'We may be entering an era when it's difficult for the military and politicians to lie'

Written by
Nevin Thompson

Posted **7 April 2022 14:09 GMT**

Read this post in **Malagasy**, **Italiano**, **Português**, **Nederlands**, **Română** , **Español**, **русский**, **українська**, **Français**



The 'Satellite Images Map of Ukraine Project' presents of images of war damage in Ukraine, such as evidence of fire visible in the windows of a destroyed building. Image provided by Hidenori Watanave, used with permission.

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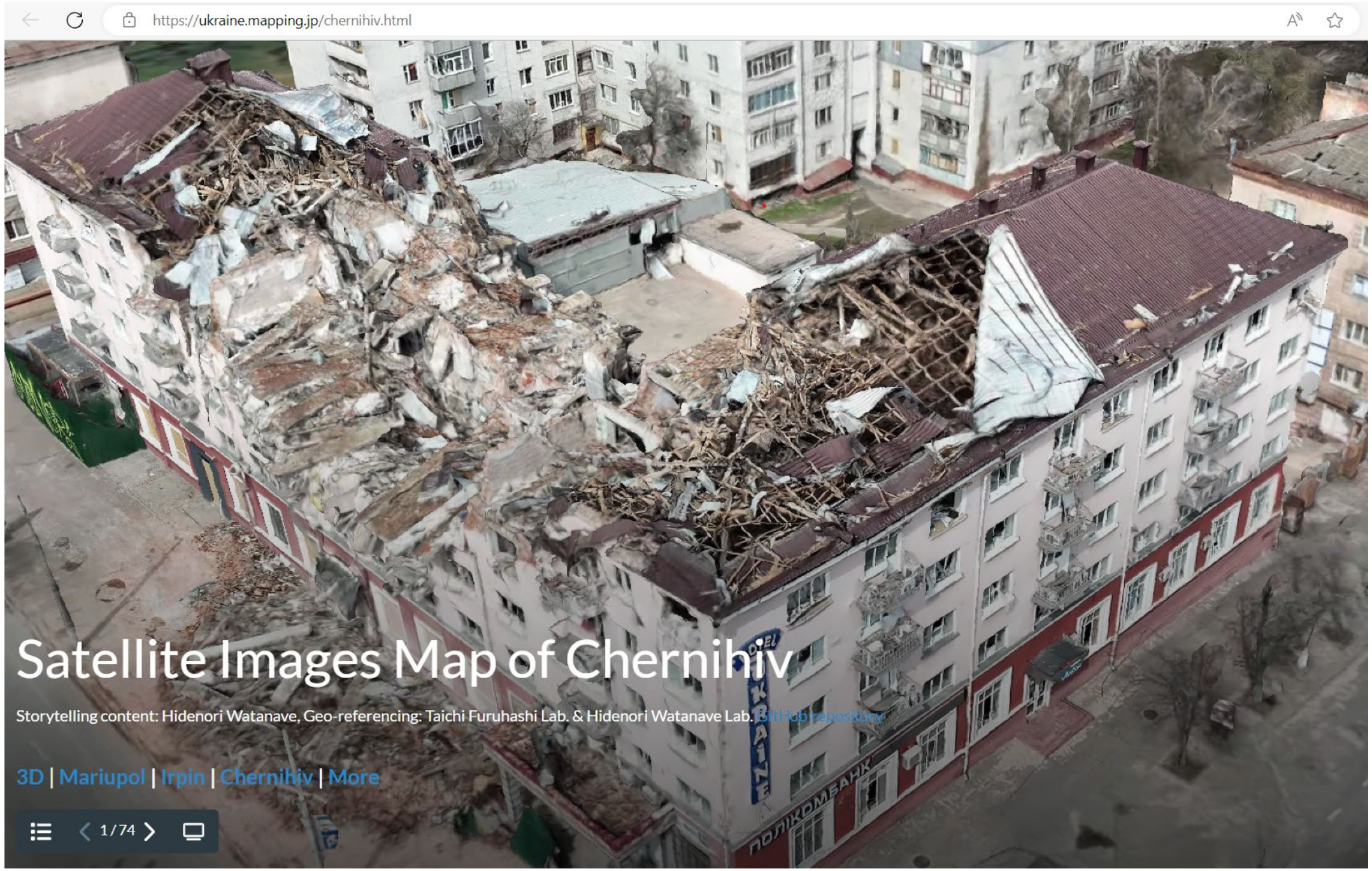
https://ukraine.mapping.jp/chernihiv.html
Satellite Images Map of Chernihiv
Storytelling content: Hidenori Watanave, Geo-referencing: Taichi Furuhashi Lab. & Hidenori Watanave Lab. GitHub repository
3D | Mariupol | Irpin | Chernihiv | More
1 / 74
ПОЛІКОМБАНК

optoppen

Hergebruik
casco

Hergebruik
bouwdelen

Louis Hiddes, Panagro Vastgoedontwikkeling/ Panagro Aannemingsmaatschappij

Break out session

- Given a by violence affected building (https://ukraine.mapping.jp), please prepare a poster (see link below) which presents a typology of values that potentially can be retained?

https://miro.com/app/board/uXjVMN5BMDc=/?share_link_id=347103807363

- Distinct typologies are possible varying from technical-environmental to socio-economic, reflecting a value proposition point of view of what can be done with the buildings during post-conflict reconstruction.
- Depict on the poster the selected building and the typology of values
- Note that you should be able to present an argument for the typology as you might be asked to present your poster during the plenary closure of the session (within 2 minutes)

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Break out session

- HAVE A FRUITFUL & INSPIRING BREAK OUT SESSION!

Final comments [by Roman Puchko]

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Thank you for your attention!

Please visit:
https://surd.nl/
https://www.superlocal.eu/

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