

SUPERLOCAL

SUPER CIRCULAR ESTATE

Circulaire gebiedsontwikkeling in Kerkrade



Dit project wordt medegefinancierd door het Europees Fonds voor Regionale Ontwikkeling in het kader van het Urban Innovative Actions Initiative.



Milieu en kostenanalyse

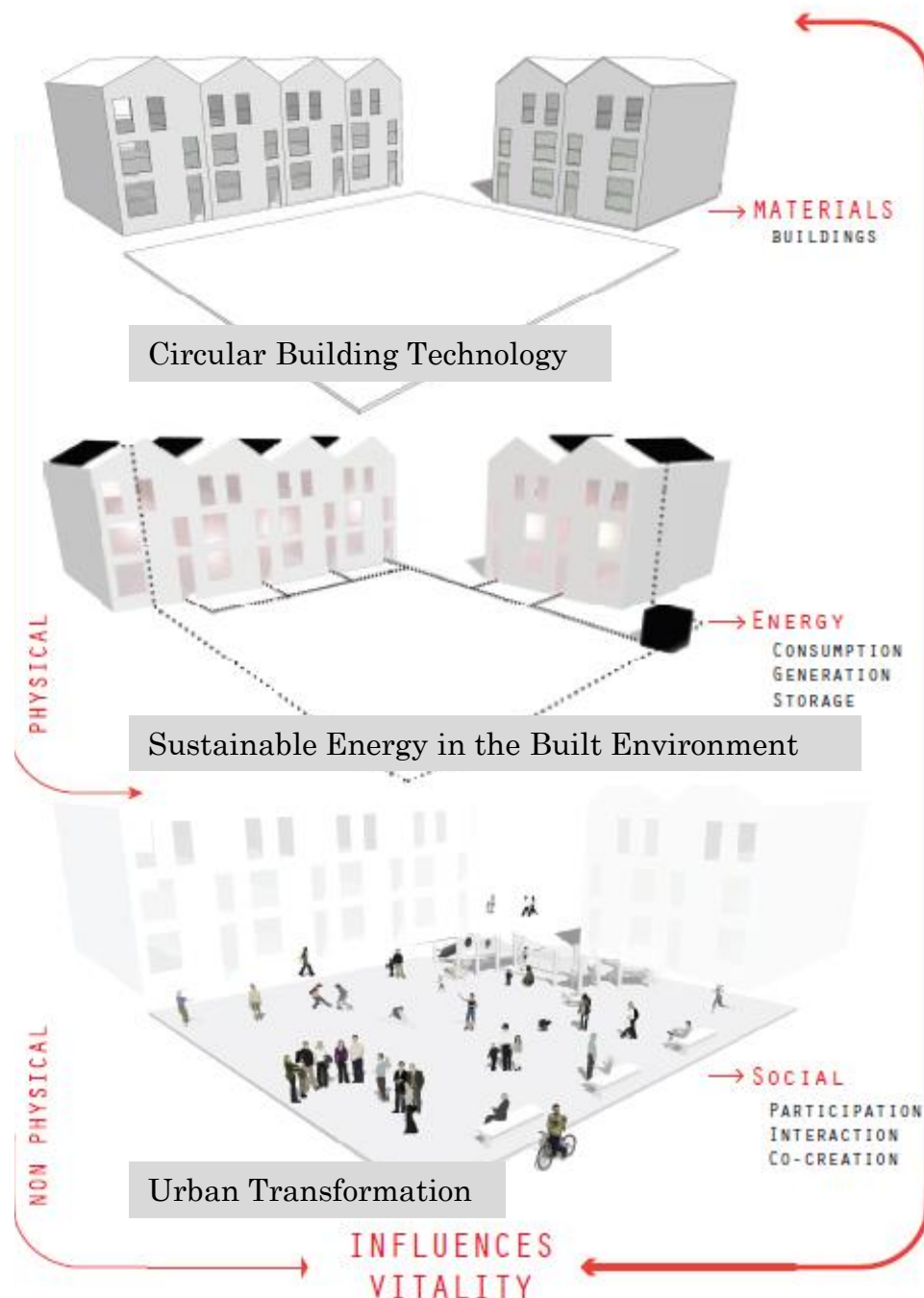
VERAS bijeenkomst 7-4-2021

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Lectoraat Smart Urban ReDesign (SURD)

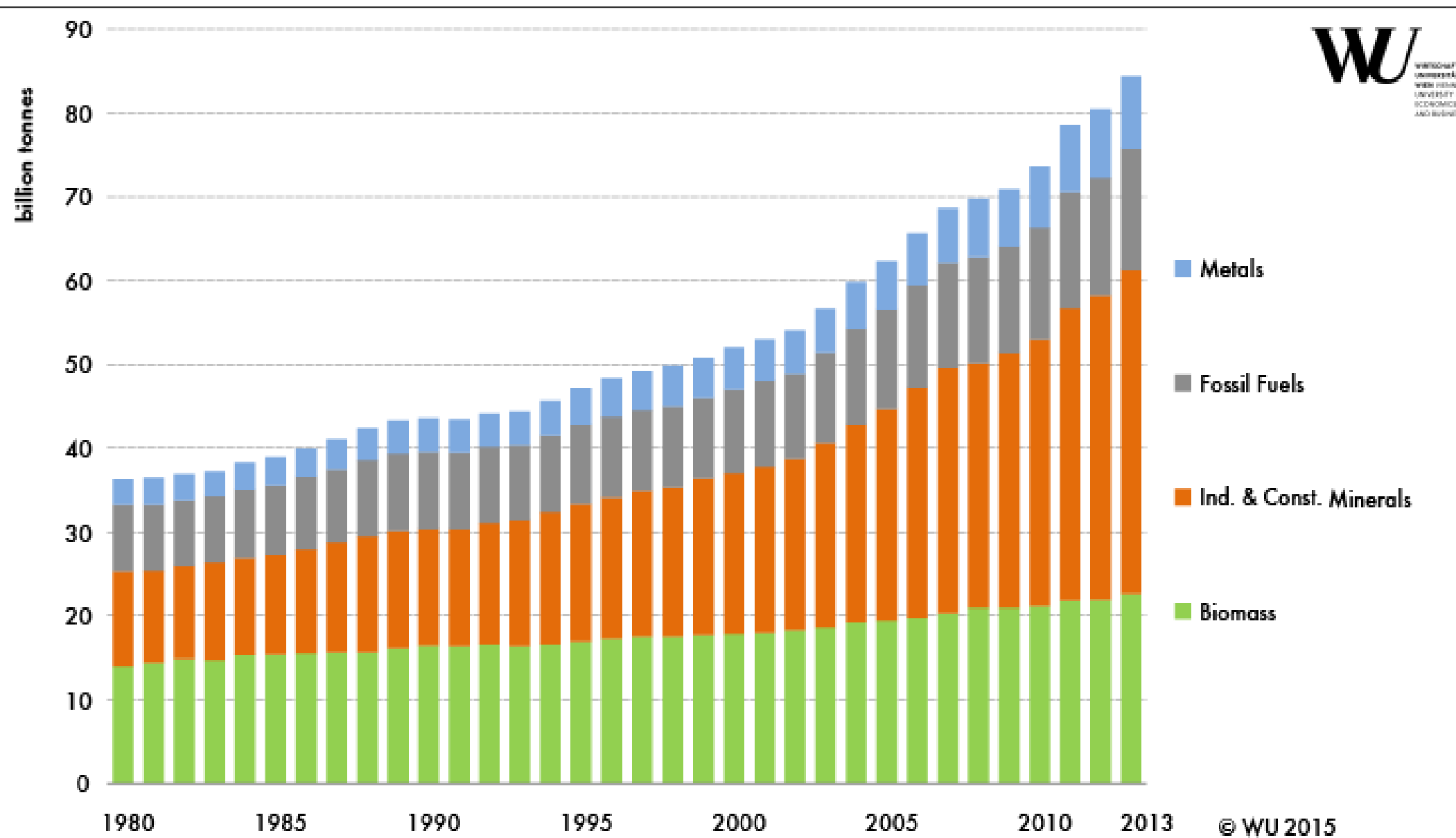
Wij dragen bij aan de kennisontwikkeling en disseminatie om een vitale, circulaire en energie neutrale gebouwde omgeving te realiseren.



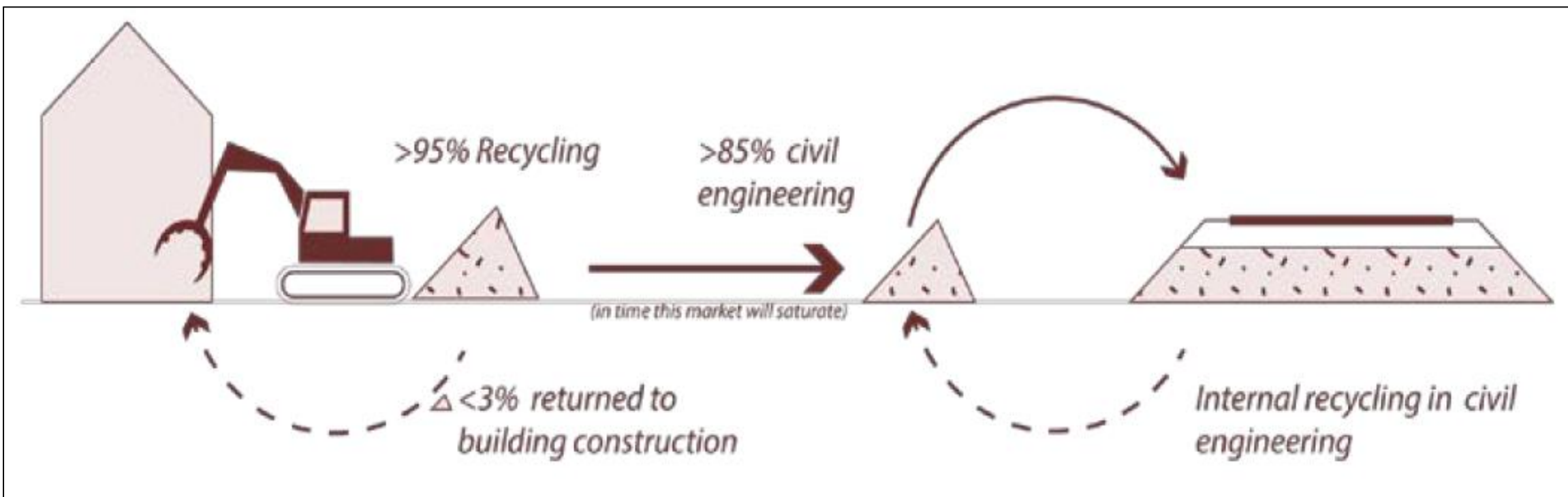
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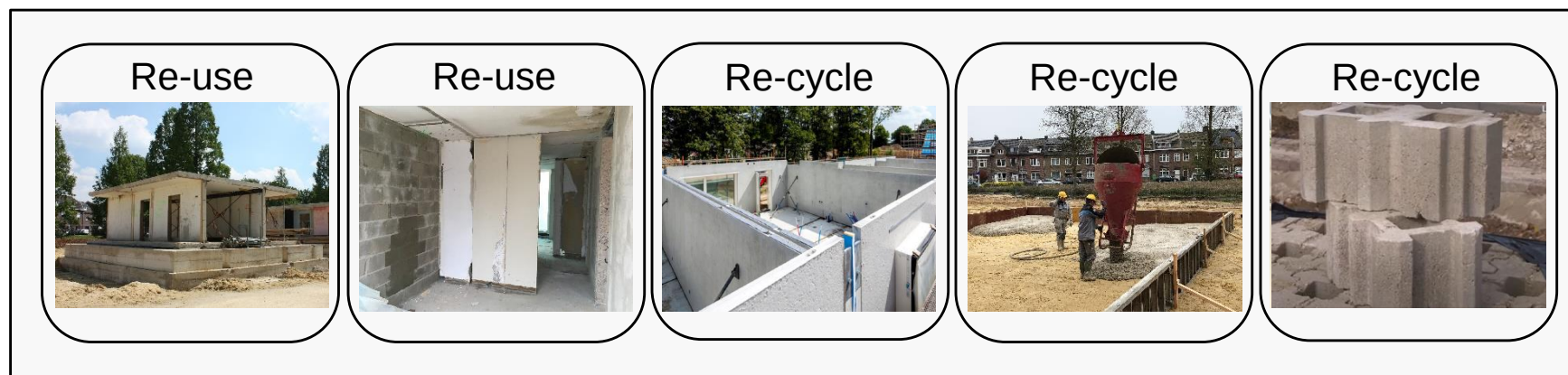


Source: TNO, 2017



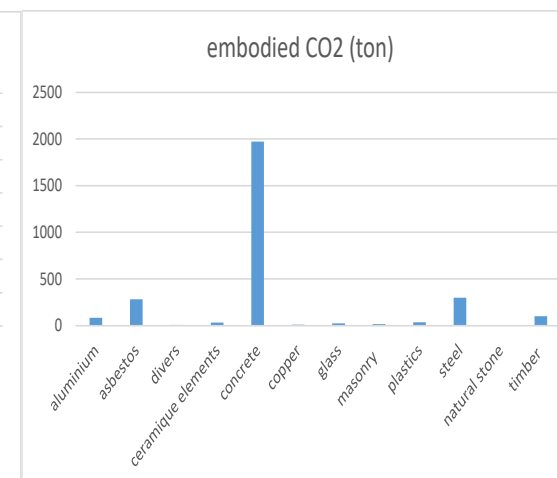
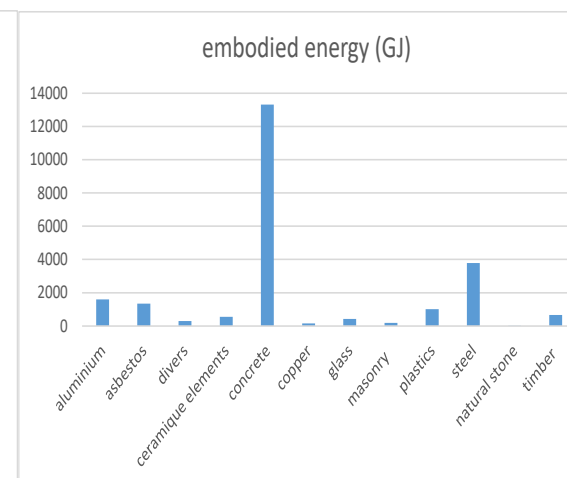
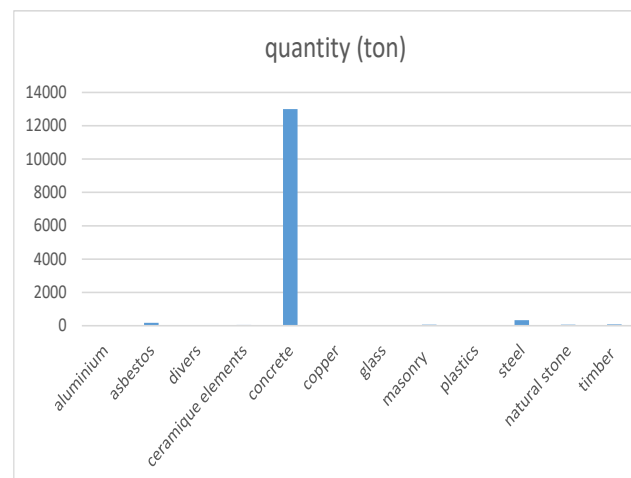
3 onderdelen:

1. Milieu impact woningen
2. Milieu impact beton casco's
3. Kosten impact beton casco's





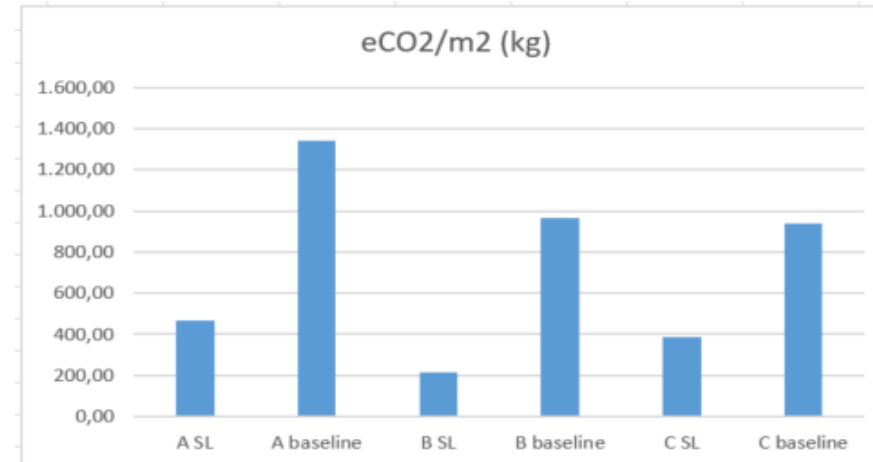
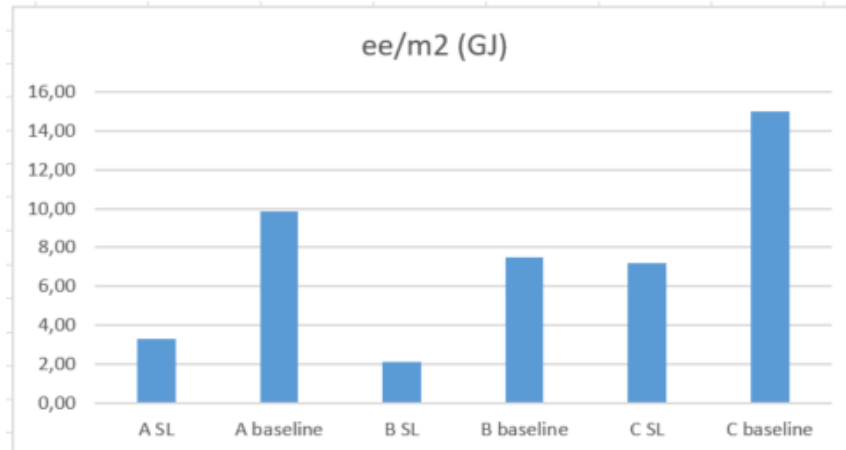
material	quantity (ton)	embodied energy (GJ)	embodied CO2 (ton)	shadowcosts (€)
aluminium	1.03E+01	1.59E+03	8.45E+01	2.11E+03
asbestos	1.81E+02	1.34E+03	2.82E+02	7.05E+03
divers	1.78E+01	2.97E+02	6.23E+00	1.56E+02
ceramique elements	4.40E+01	5.50E+02	3.41E+01	8.52E+02
concrete	1.30E+04	1.33E+04	1.97E+03	4.93E+04
copper	7.45E+00	1.52E+02	9.81E+00	2.45E+02
glass	1.75E+01	4.26E+02	2.56E+01	6.40E+02
masonry	6.38E+01	1.92E+02	1.47E+01	3.67E+02
plastics	1.24E+01	1.00E+03	3.50E+01	8.74E+02
steel	3.26E+02	3.79E+03	3.00E+02	7.50E+03
natural stone	6.05E+01	5.12E+00	2.96E-01	7.40E+00
timber	7.15E+01	6.64E+02	1.00E+02	2.50E+03
total	1.38E+04	2.33E+04	2.87E+03	7.16E+04



Ritzen, 2018, 2020

3 woningen

SL variant								
type	surface (m2)	mass (ton)	embodied energy (GJ)	embodied CO2 (ton)		mass/m2 (ton)	ee/m2 (GJ)	eCO2/m2 (kg)
A	74	631	242	35		8,53	3,27	467
B	74	583	154	16		7,87	2,08	217
C	40	87	531	29		1,17	7,17	389
baseline variant								
type	surface (m2)	mass (ton)	embodied energy (GJ)	embodied CO2 (ton)		mass/m2 (ton)	ee/m2 (GJ)	eCO2/m2 (kg)
A	74	631	727	99		8,53	9,83	1342,82
B	74	583	555	72		7,87	7,50	966,94
C	40	87	600	37		2,17	14,99	936,32

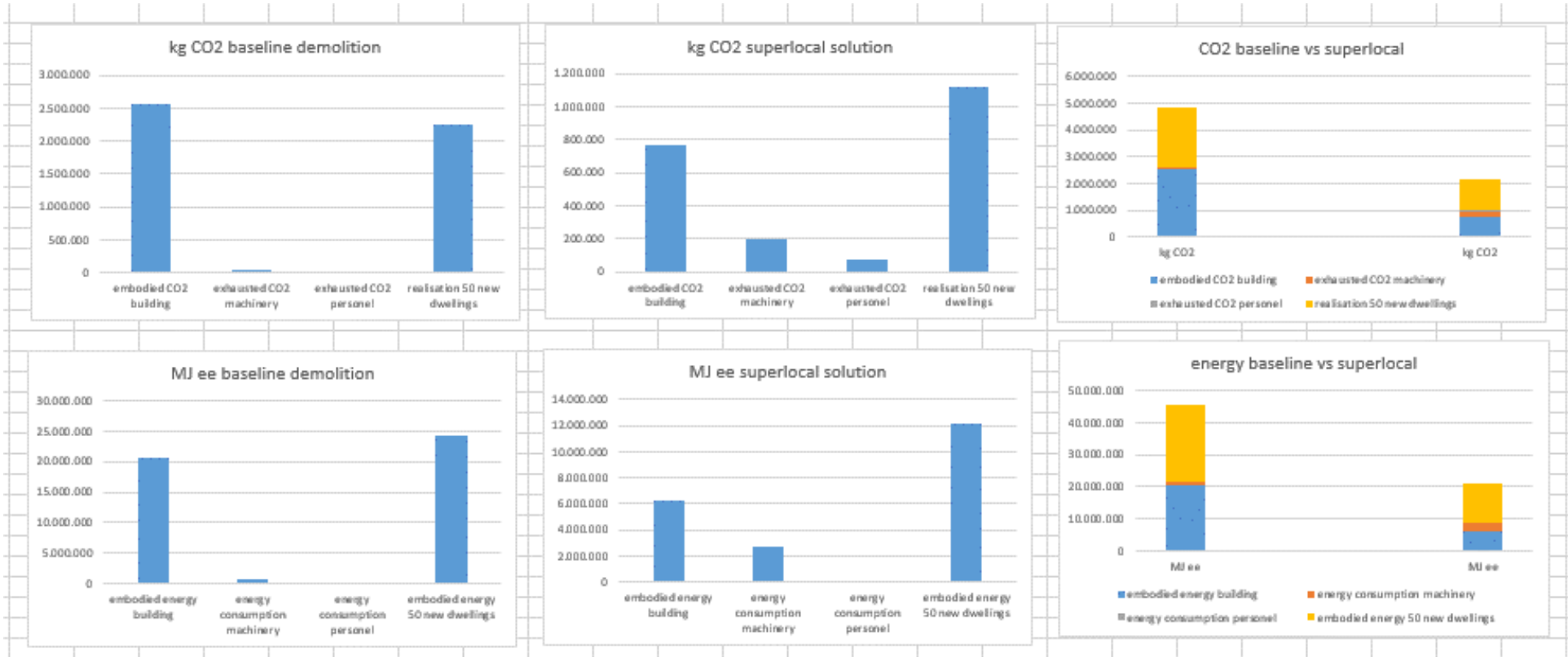


Driessen & Ritzen, 2020

Opschaling naar 50 woningen

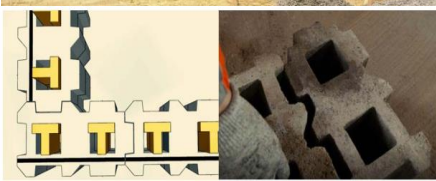


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Ritzen, 2020

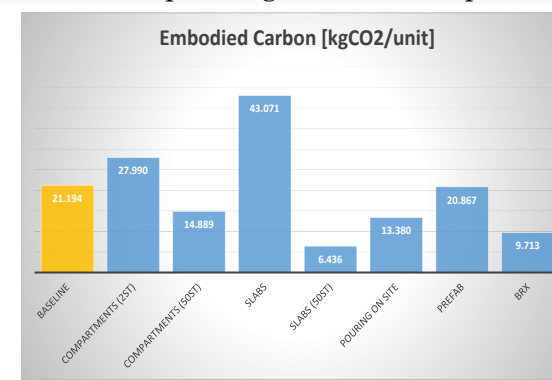
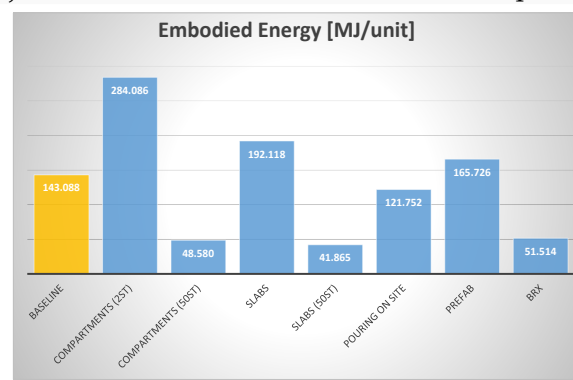




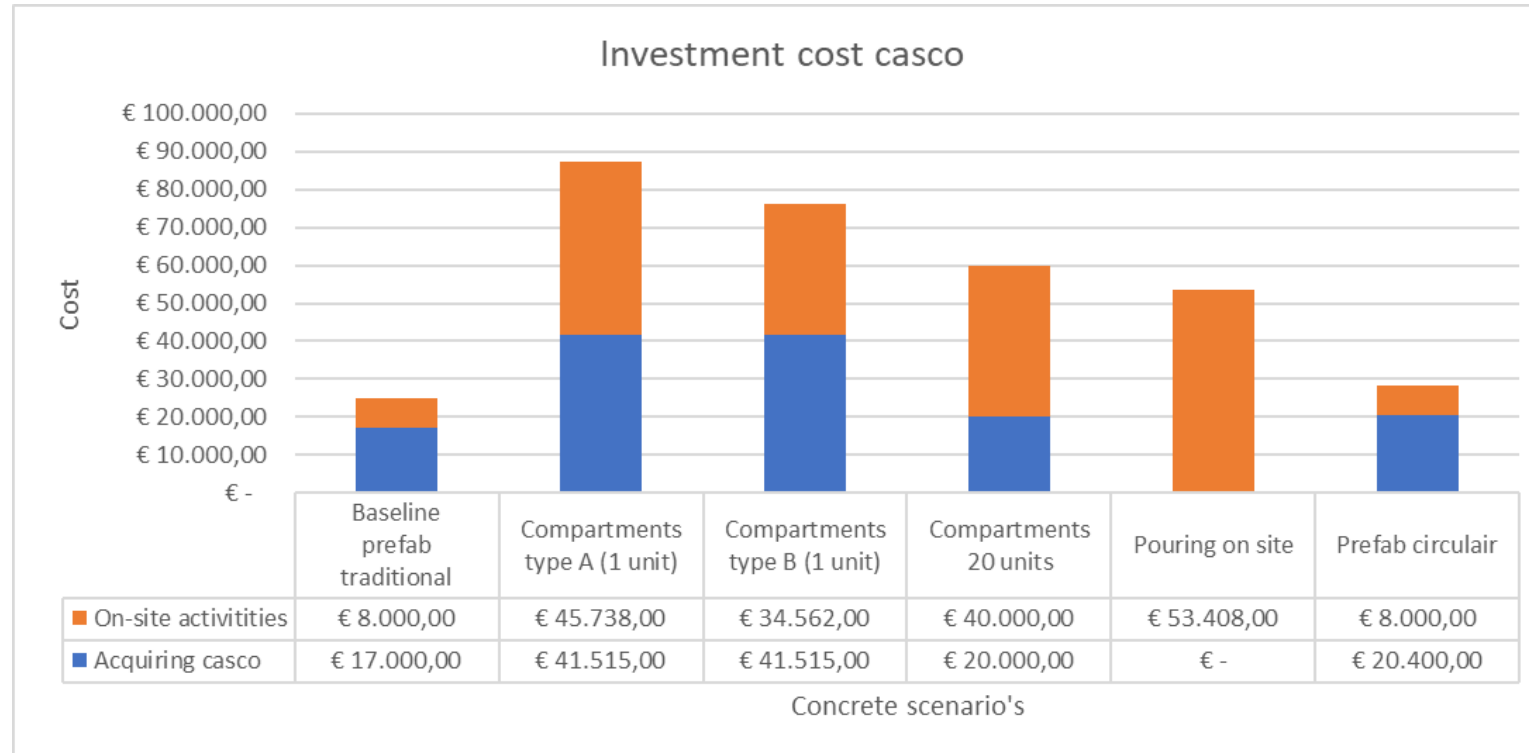
	Embodied Energy [MJ/unit]	Embodied Carbon [kgCO ₂ /unit]	Percentage saved on EE compared to baseline.	Percentage saved on ECO ₂ compared to baseline
Baseline	143.088	21.194		
1. Compartments	284.086	27.980	-99%	-32%
1. b Compartments	48.580	14.889	66%	30%
2. Slabs	192.118	43.071	-34%	-103%
2. b Slabs	41.865	6.436	70%	70%
3. Onsite pouring	121.752	13.380	15%	37%
4. Prefab elements	165.726	20.867	-16%	2%
5. BRX bricks	51.514	9.713	58%	27%

Vd Bogert & Ritzen, 2021

*Scenario 1b and 2b represent the outcome for upscaling to maximum potential of the scenario



Kosten per betoncasco.



Fernandez & van Oorschot, 2021



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Dank voor uw aandacht!

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