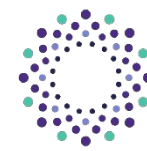




The
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regenerate 



URBAN FLOWS
OBSERVATORY

CE Research at Sheffield

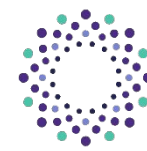
Danielle Densley Tingley, Maud Lanau, & Charles Gillott

urbanflows.ac.uk/regenerate



The
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regenerate 

The word 'regenerate' is written in a lowercase, sans-serif font. To its right is a graphic consisting of three overlapping circles in shades of teal and purple.

URBAN FLOWS
OBSERVATORY

How circular is your building?

urbanflows.ac.uk/regenerate

Circularity Overview

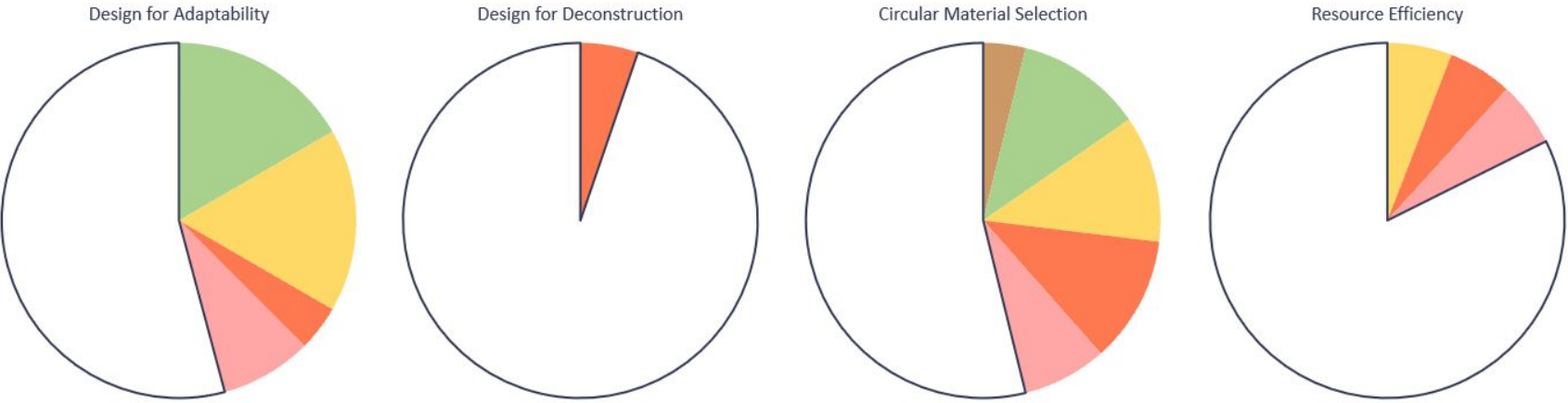
Credit Summary

Circularity Principle	Selected Circularity Aim	Building Layer	Circularity Credits			Awarded Circularity Rating
			Total	Percentage of Selected Aim	Percentage of Total Credits	
Design for Adaptability	Full Circularity	Site	0	0%	0%	No Rating Achieved
		Structure	4	40%	40%	No Rating Achieved
		Skin	4	67%	67%	Basic Circularity
		Services	1	50%	50%	No Rating Achieved
		Space	2	50%	50%	No Rating Achieved
		ALL	11	46%	46%	No Rating Achieved
Design for Deconstruction	Full Circularity	Site	0	0%	0%	No Rating Achieved
		Structure	0	0%	0%	No Rating Achieved
		Skin	0	0%	0%	No Rating Achieved
		Services	1	25%	25%	No Rating Achieved
		Space	0	0%	0%	No Rating Achieved
		ALL	1	5%	5%	No Rating Achieved
Circular Material Selection	Full Circularity	Site	1	100%	100%	Full Circularity
		Structure	3	43%	43%	No Rating Achieved
		Skin	3	50%	50%	No Rating Achieved
		Services	3	50%	50%	No Rating Achieved
		Space	2	33%	33%	No Rating Achieved
		ALL	12	46%	46%	No Rating Achieved
Resource Efficiency	Full Circularity	Site	0	0%	0%	No Rating Achieved
		Structure	0	0%	0%	No Rating Achieved
		Skin	1	33%	33%	No Rating Achieved
		Services	1	33%	33%	No Rating Achieved
		Space	1	33%	33%	No Rating Achieved
		ALL	3	18%	18%	No Rating Achieved

Awarded Credits by Circularity Principle



Awarded Credits by Building Layer



Maximising the reuse of existing buildings through vertical extension.

Charles Gillott

Context and Rationale

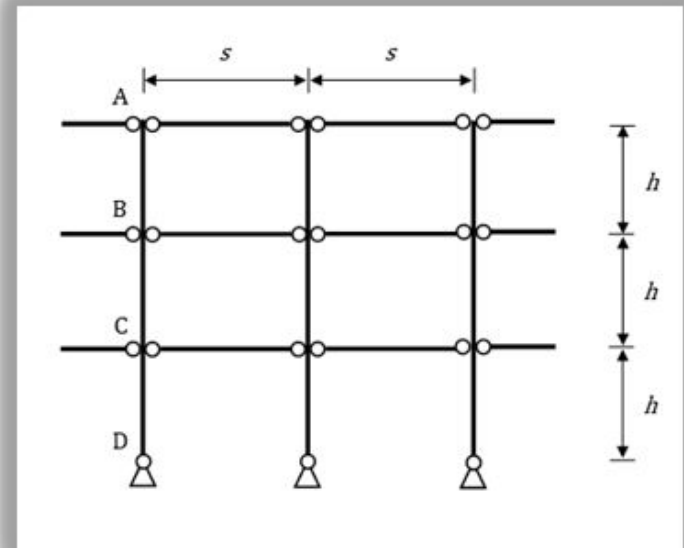
- A worsening housing crisis.
- Urban sprawl must be stopped.
- The benefits of building adaptation.
- Likelihood of reserve structural capacity in existing buildings.
- Recent changes to permitted development rights.

Ongoing Work: Reserve Structural Capacity

Analysis of case-study buildings to ascertain reserve structural capacities.

Focuses on column's ability to resist increased axial loads.

Reserve capacities compared in different reporting units.



Ongoing Work: Stakeholder Survey

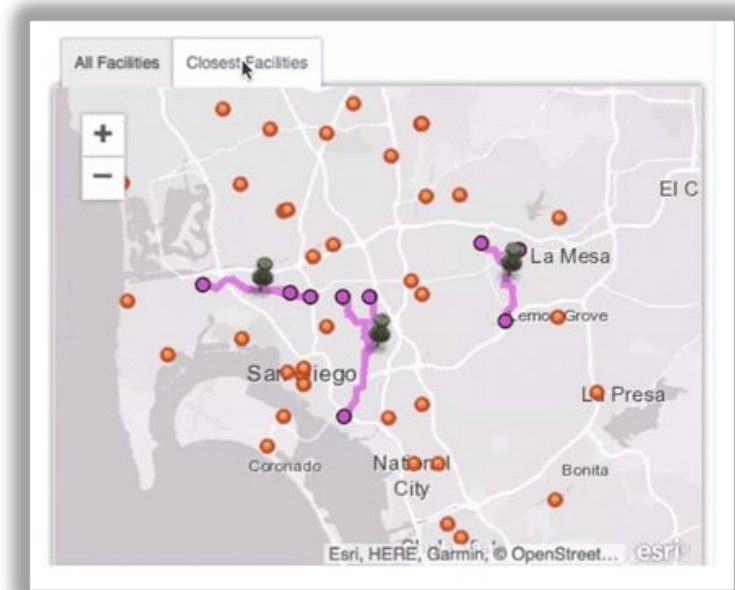
- Relevant to all stakeholders.
- Assess awareness and adoption within the construction sector.
- Considers key challenges and enablers of vertical extension.



[Take the survey](#)

Potential Future Work

- City scale analyses.
- Potential limitations and impacts.
- Comparative assessment(s).



Circular Economy Potential of Non-Residential Building stock

Resource Efficient Cities & Nations



Modelling building stocks

What we need:

location, type and amount of construction materials/building components stocked in buildings

Why:

to plan for circular economy: recovery, storage, transport, reuse

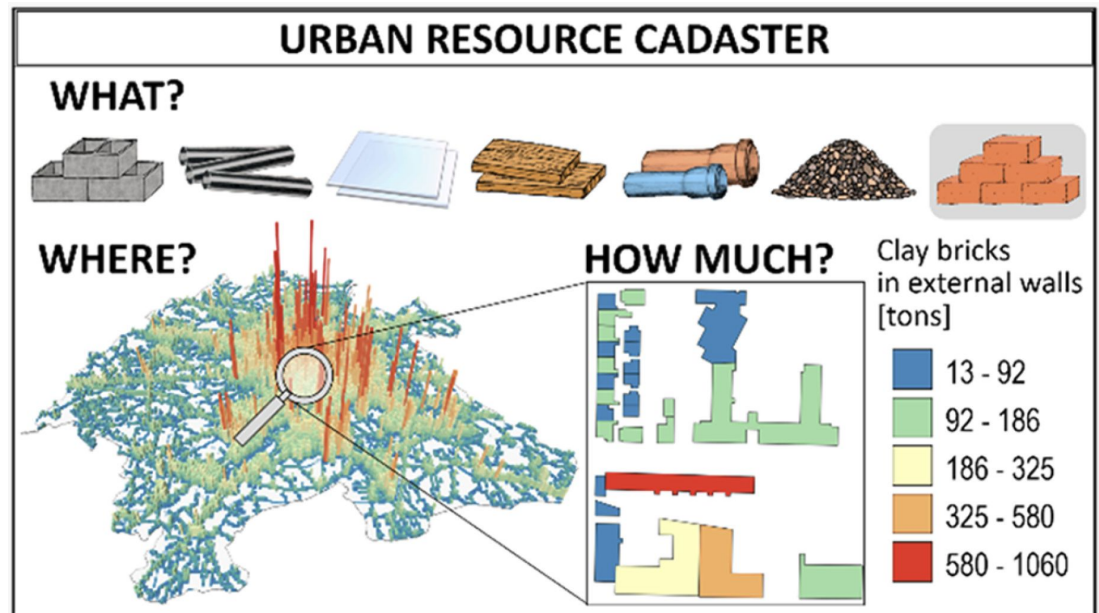
How:

Bottom-up approach x GIS

Bottom-up approach: Odense, DK

- Classifying buildings into archetypes (time cohort, building use, building structure)
- For each archetypes: material intensity coefficient
- GIS data: location of buildings

BUT material info:
not enough for CE.
Need for info at the
component-level



[Lanau, M.](#), & [Liu, G.](#) (2020). Developing an Urban Resource Cadaster for Circular Economy: A Case of Odense, Denmark. *Environmental Science & Technology*, 54(7), 4675-4685.

UK Non-residential building stock

NRB stock: harder to analyse (lack of data), but very relevant for CE (more metals, shorter lifetimes).

We need data on existing buildings!

→ Data call: BIM models and/or structural drawings containing as much detail as you can provide

→ Outputs: CE potential of buildings & benchmark

Note: data will be **anonymised**.



(click [here](#) for more info, and [here](#) for the data form)



[Click here to take the stakeholder survey](#)



[Click here to complete the data capture form](#)