Accelerating Circular Economy Transitions for a Sustainable Built Environment

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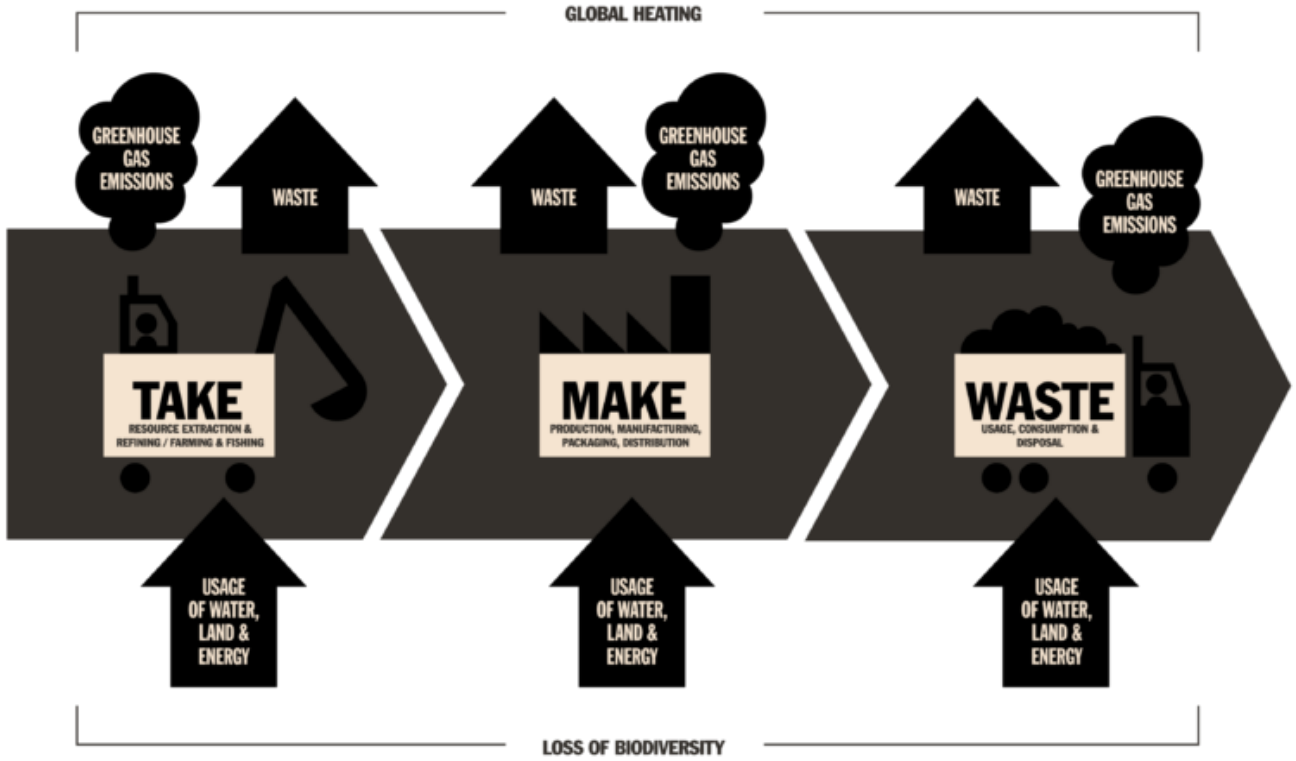
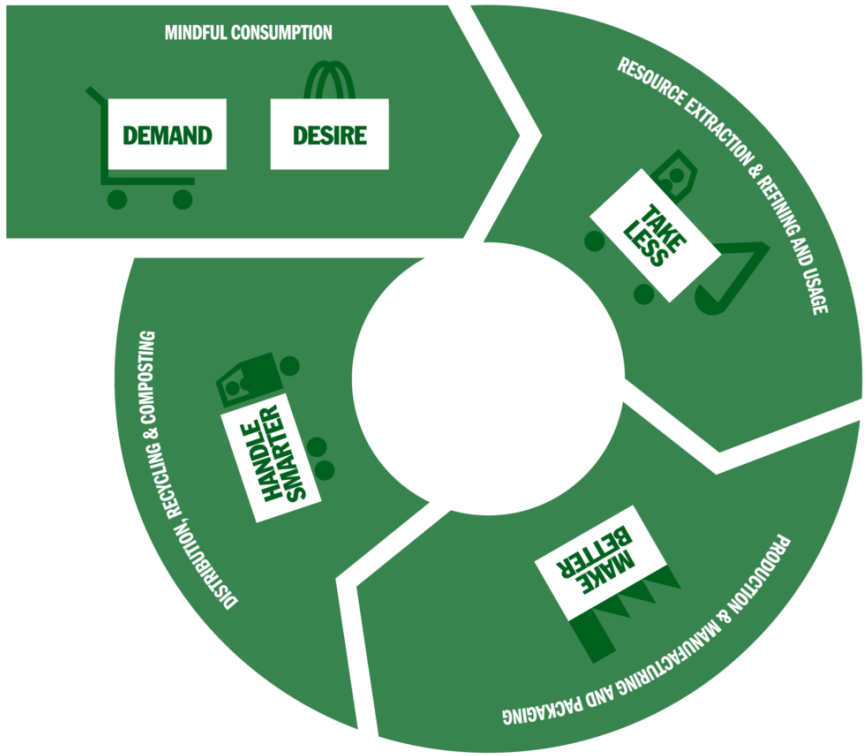
Impacts of the Built Environment

- 40% of global raw materials demand. (EPA 2018)
- >75% of construction waste ends up in landfills. (EPA 2018)
- 37% of global CO2 emissions. (Ellen MacArthur Foundation 2019)
- 10% of which are attributed to embodied carbon.

Linear vs. Circular Economy (CE)



Adopted from: What Design Can Do (WDCD) - 2021



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CE & the Built Environment

- In 2020, only 8.6% of the consumed raw materials made it back to the economy (Circularity Gap 2020).

- Circularity gap of > 90%

- Built Environment: High Growth – High Waste ?

CE Transitions: Scales and Directions

Owners

Reconsider?
Owner requirements
Certifications metrics

A/E Firms

Low impact design
Design for adaptability
Performance Specs

Contractors

Procurement
Prefabrication
Product Passports & EPDs
Performance contracting

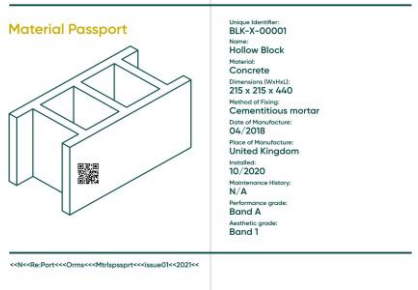
Macro:
Urban Stocks

Meso:
Project-level

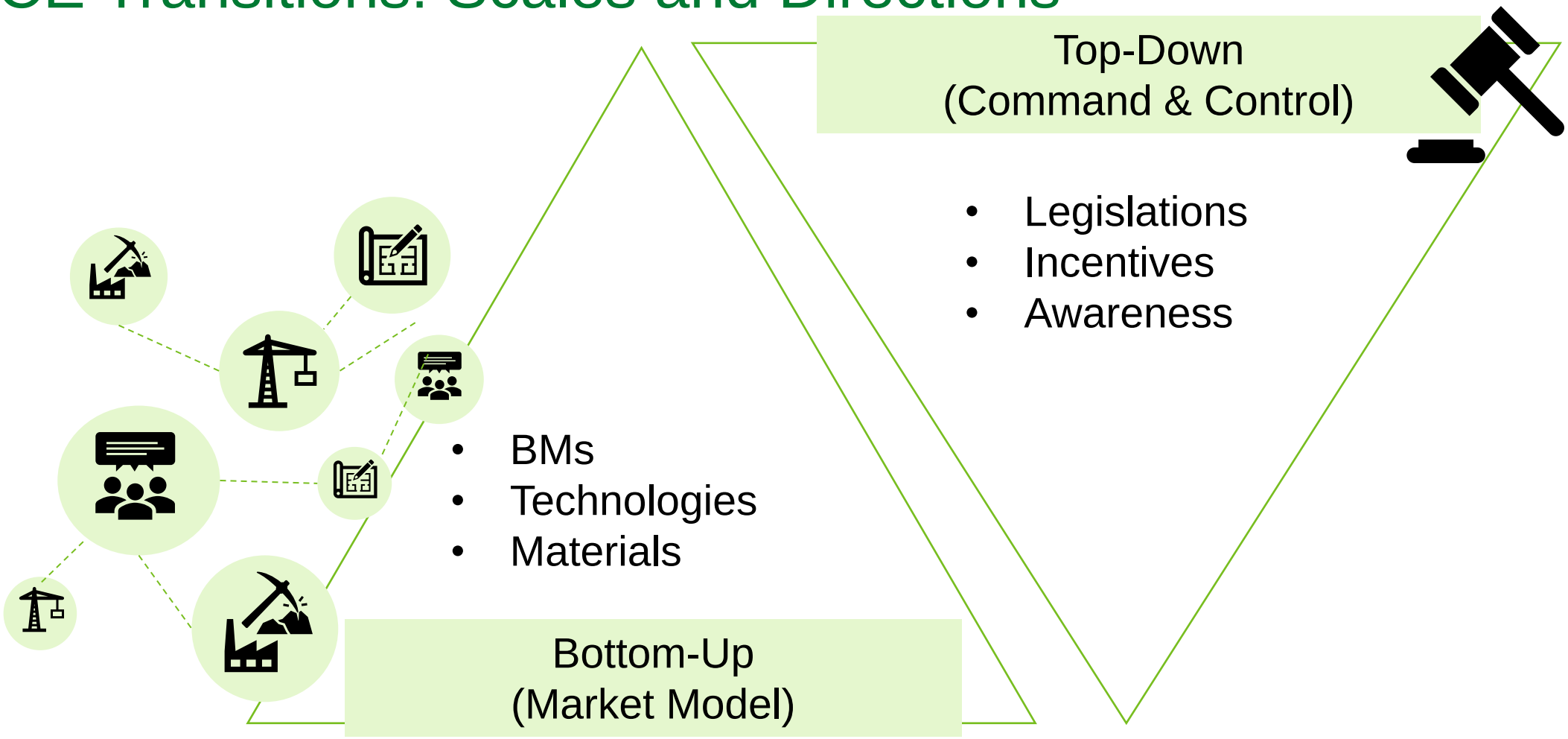
Micro:
Firms

Suppliers

Material Passports & EPDs
Sell and buy back
Product as service



CE Transitions: Scales and Directions

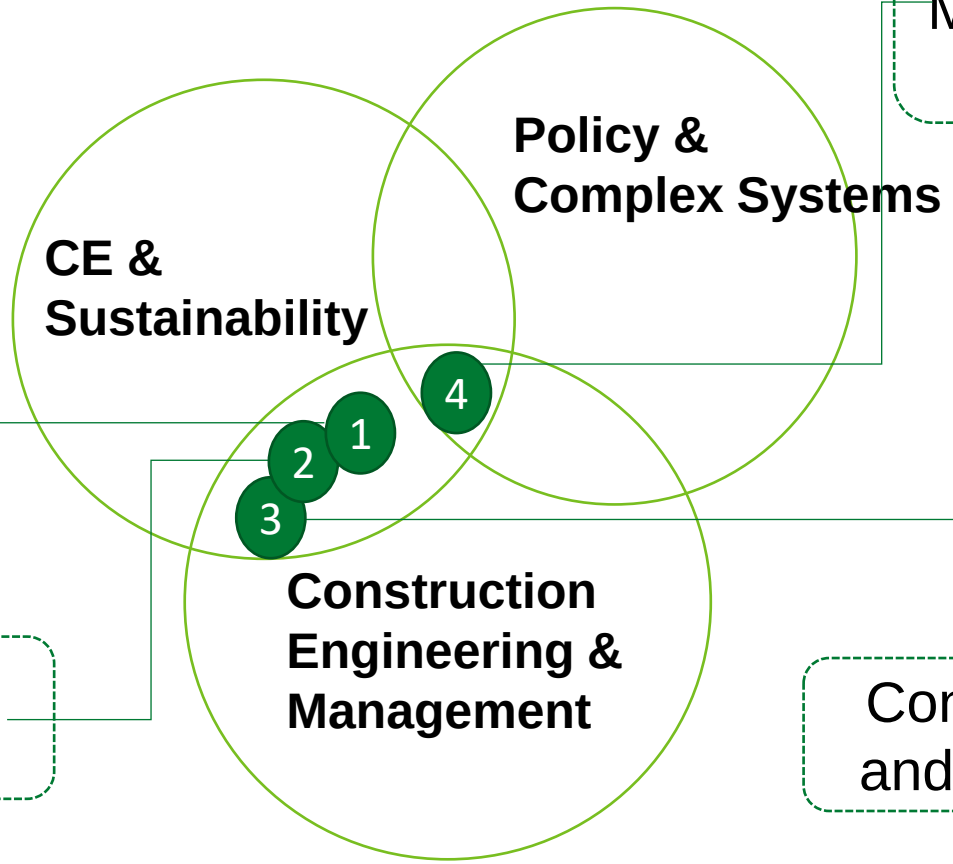


Accelerate CE transitions in the construction sector through a systems-based approach, accounting for:

- Scales and directions of change.
- The uniqueness of the construction industry, the diversity of its stakeholders.

Top-Down / Bottom-Up Modeling and Simulation of CE Transitions

Construction Stakeholder-specific CE Transition Strategies



CE in Green Building Certifications

Construction Procurement and Contracting for the CE

"For investors and construction clients, adopting the circular economy means an **improved return on investment**, while also contributing to **achieving carbon emissions targets**." – *Ellen MacArthur Foundation, 2021*

"Adopting circular economy principles could significantly enhance global construction industry **productivity**, saving at least **US$100bn a year**." —*World Economic Forum, 2016*