

Circularity in the built environment

THE PERSPECTIVE FROM
SOCIAL, PUBLIC AND
COOPERATIVE HOUSING

An aerial photograph of a circular green field, possibly a park or a sports field, with a blue border. The word "DRIVE" is written in large, bold, dark green capital letters across the center of the field. To the right of the word is a circular arrow icon, indicating a cycle or a continuous process.

DRIVE 

HOUSING EUROPE

Membership of **45 housing federations** (public, cooperative and social housing) in 24 European countries

Representing **4.500 housing providers** and 28.000 housing cooperatives.

Housing stock of **26 million dwellings**, about 11% of existing dwellings in the EU.



This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant 841850



ENVIRONMENTAL GOALS

Complementing EE efforts with CE goals to achieve synergies.



- **Integrating circularity in EE/RE** plans to include other resources: embedded energy, building materials, demolition waste, domestic waste, land (sand), water, IEQ, etc.
- Take into account the different **life-cycle stages** by using LCA's and LCC approach.
- Use of **different certification** schemes and assessment frameworks: BREEAM, LEED, LEVELS (EC), EDGE, etc.



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“Increasing the building lifetime is one of the single most effective actions that can be taken to reduce the need for construction materials. Around 85% of the CO2 footprint of materials is associated with structural elements. Yet when buildings are demolished, it is typically not because their structures are no longer usable in any technical sense.

Old buildings are razed for social or economic reasons: architectural tastes have changed, new types of housing or commercial spaces are needed; the neighbourhood has evolved; or the cost of renovating the building is higher than demolition and new construction.

The key is for buildings to be adaptable to the changing requirements of their users”

Source: The Circular Economy - a Powerful Force for Climate Mitigation, Material Economics, 2018

SOCIAL AND AFFORDABLE

Resource efficiency vs cost-efficiency



- Mainstream CE based on adequate **business and financing models**.
- Real estate **valuation** at end of life-cycle. E.g. demolition costs or deconstruction.
- Benefits of combining more flexible and modular buildings both for **circular and for housing purposes**.
- Ultimately CE is about **retaining resources and thus value** and should be able to generate cost-efficiencies for (long-term) investors and people.



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PEOPLE CENTRED

Strengthen communities, change behaviours and create awareness



- **Socio-logical effects:** densification; behaviour changes/awareness creation, nature-based solutions (materials, green spaces, agriculture, local supply)
- Residents' involvement **condition *sine qua non*** and requires **human-centred approach** during planning, design, occupancy and end-phase/(re)development.
- Need to **generate tangible and direct benefits** from a resident's point of view.
- Social housing organisations **promote wider CE initiatives** like repair-café, furniture up-cycling, tool sharing, etc.
- **Social economy principles** of sector (public task, not-for-profit and revolving) generate profits for **local stakeholders** (job creation, materials, environment, etc.)



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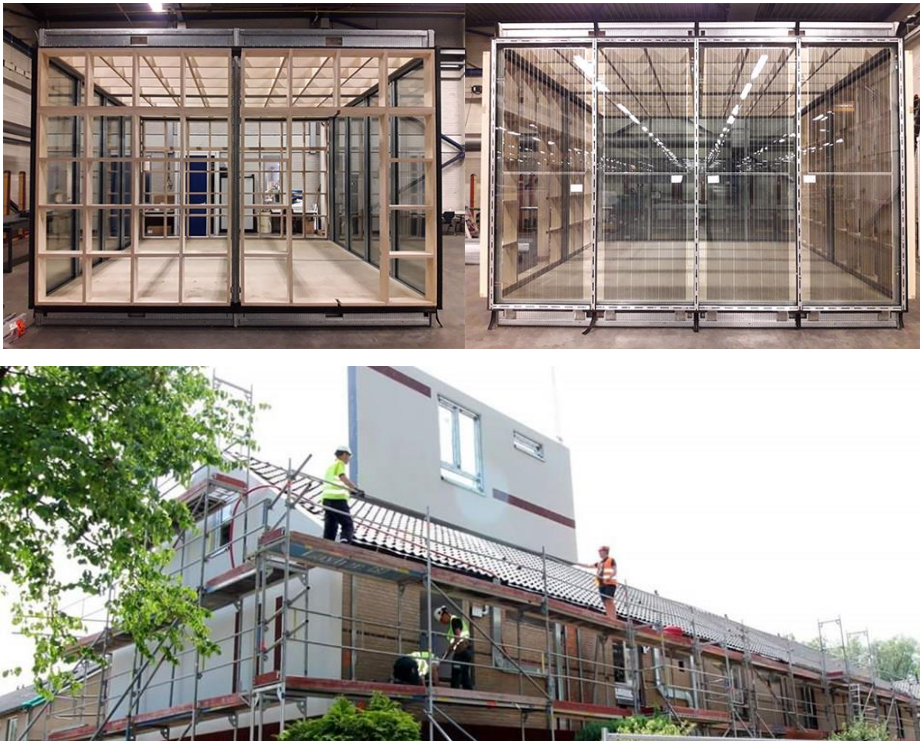
“The gap between a conventional social dwelling and the pilot case with reused materials remains significantly high (approx. + €1.500,-/ m²), even if reuse of carbon is calculated as a financial benefit.

Improvements of deconstruction technique are needed. At the same time this emphasizes the importance of adopting new design and construction strategies for new buildings to enable easy disassembly of building parts.

The way materials and elements are assembled together will determent the value of the material bank, its future reuse potential and the market value of building products.”

INNOVATIONS

Circularity is one of the Next Frontiers of social and affordable housing in Europe.



HOUSEFUL develops 11 circular solutions for the circular management and efficient use of water, waste, energy and material resources for all stages of the building's life-cycle. AHC (ES), Neues Leben (AT). HE (EU) manages **Collaborative Community of Housing Experts** on circular housing.

HOUSING EVOLUTIONS Innovation category: *Environment and Resource efficiency* www.housingevolutions.eu

CHARM Circular Housing Asset Renovation & Management to prevent downcycling of materials in renovation and construction of social dwellings. Paris Habitat (FR), Woonbedrijf (NL), Zonnige Kempen (BE), European Federation for Living (EU), USH (FR), SHAP (UK).

UIA SUPER CIRCULAR ESTATE Experiment with circular economy processes aimed at **100% reusing and recycling of materials** from the demolition of an outdated social housing high-rise flat. HeemWonen (NL).

BAMB Building as material banks incl reversible design, circular retrofits, material passports. Reusable building components and adaptable buildings, conserve the value better and strengthen the long-term business case.

INDU-ZERO Factory designs for NZEB renovation packages. Quicker and less expensive. External insulated envelope, heat-recovery ventilation, renewable energy generation all recyclable (circular). Social housing provider Domijn (NL)

EIT Climate-KIC The Circular Kitchen Ymere (NL), Eigen Haard (NL), Waterweg Wonen (NL), Woonbedrijf (NL), HSB (SE)



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Conclusions about Circularity in Housing

Strategy: place housing-related CE initiatives in larger scope that generates direct benefits for/with residents and cost-efficiencies for housing providers.

Technical Innovations: Deconstruction techniques (existing), disassembly of materials (new), integration of supply chains, ICT possibilities.

New business models: translate resource efficiencies in cost-efficiencies.

Social Innovations: create awareness about benefits/possibilities of resource and energy efficiency; find synergies between social and circular economy.

Architecture: adaptability of housing (re-use of space, conversion of use, down- / right-sizing).

Thank you

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