

Circular Design for Affordable, Human-Centred and Zero-Waste Urban Housing

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Abstract

This research seeks to develop a step change to the way housing is designed for cities in the UK. It will address three main issues: 1) demand for 3 million new homes of which half affordable homes by 2030; 2) 75% natural resources consumption, and 30% waste production from construction and demolition; 3) risk of job losses because of technological changes and globalisation. Circular economy offers new ways to design, make and use buildings to address these issues. The implementation of the circular economy in urban housing can promote a systemic change for fostering the development of affordable, zero-waste, human-centred homes as long as technical innovation is combined to social innovation. To date, circular economy has mainly focused on technical innovation with limited emphasis on user behaviour. This project aims to explore a way to fill this gap using a combined approach to generate a socio-technical solution that implement a circular economy and support its social embedding in a social housing community in London. The project is harnessing design research methods to redesign a domestic kitchen as a hybrid system of products and services combined to a social enterprise. This system will be integrated with a circular business model to describe how collective value creation and retention is organised between parties involved, and with a strategy to support the social embedding of the system. The envisioned system will keep resources in use as long as possible through reuse, refurbishment and re-manufacturing as well as recycling at the service-life end minimizing waste generation and materials consumption. A system platform will support product-information tracking and services supply underpinning a social enterprise within the community. The enterprise will provide access locally to products and services as well as fabrication space, tools and training, thereby promoting socio-economic benefits in the community. Finally, the integrated system will be assessed in terms of expected value and revenue, waste generation, job creation and social consensus to provide understanding on the adopted approach for the implementation of affordable, zero-waste, human-centred urban housing.

Keywords: Circular Economy, Social housing, product-Service System, Social innovation; System innovation