

## Stop wasting buildings!

### Capturing circular qualities of non-residential buildings

#### Challenge Collaborator: Who is behind this challenge?

The challenge addresses diverse stakeholders from the real estate industry, building design and construction as well as urban planning while providing entrepreneurial opportunities.

Behind the challenge are the Institute of Energy Efficient and Sustainable Design and Building (ENPB) and the Chair of Circular Economy (CE). Both are part of the TUM Mission Network Circular Economy - CirculaTUM, which aims to reinvent the way we do business and decouple prosperity from resource consumption.

The Institute of Energy Efficient and Sustainable Design and Building (ENPB) conducts research on a fundamentally sustainable transformation of our built environment.  
Team: Carsten Schade, Johannes Staudt

The Chair of Circular Economy (CE) contributes to the transition of industry and society towards sustainability through developing, assessing and optimizing circular economy and bioeconomy systems.  
Team: Josef Huber, Vanessa Heinrich, Rosina Lohmeyer

#### Introduction

To establish circularity in the built environment, we need to change the way we design, build and use buildings. In the long term, the aim must be to reduce resource consumption, extend the useful life of buildings and their components, and close material loops.

The goal of this challenge is to generate information about the spaces, usage, construction and materials of existing non-residential buildings in order to present their potential contributions to circularity in a transformation of a district (e.g., Neuperlach, Munich).

#### Problem Definition:

Non-residential buildings are often demolished because they are no longer commercially viable. This and subsequent new construction lead to considerable CO<sub>2</sub> emissions and waste. Circular strategies aim to reduce resource consumption by closing resource loops and extending the use of buildings and their components.

## What is the waste challenge?

The goal of this challenge is to assess the perspectives of circularity in the context of non-residential buildings and develop innovative design and business approaches which

- capture the spatial, material, and functional qualities of non-residential buildings and their use over time (such as room height, room depth, structural loads, access, circulation, acoustics, fire ratings, adjacencies, etc.)
- help to extend the useful life of existing buildings and/or their components
- address single buildings or larger building stocks of non-residential buildings

The goal of the challenge is to develop these approaches into tangible concepts (e.g. digital applications, visualizations which communicate the core ideas).

## Desired Impact of Challenge:

The results will contribute towards a sustainable transformation of neighborhoods. The new design and business approaches will enable circular buildings and related planning practices for the long term. They will be transferable to other cities in Germany and Europe.

## Skills needed/recommended

The following skills are useful for this challenge:

- Architectural/ spatial understanding of buildings
- Business/ real estate understanding
- Drawing and 3d modelling skills
- Interest in architectural/ urban/ spatial transformation

## Relevant links:

<https://www.nebourhoods.de/en/actions?section=Circular%20Neuperlach>

<https://www.cee.ed.tum.de/en/enpb/research/current-research-projects/creating-nebourhoods-together-munich-neuperlach/>