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Town Revitalisation through the Integration of Vacant Buildings into the Circular Economy: Final Report

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What did the research aim to address?

This collaborative research project between the Irish Centre for High-End Computing at the University of Galway and University College Dublin addresses a key research gap in Ireland in relation to the carbon costs of allowing viable town buildings to remain unutilised and fall into disrepair.

This research is relevant to the construction sector, in terms of low-carbon retrofitting, and to national and local policymaking, for helping overcome the barriers to adaptive reuse of vacant and derelict building stock faced by property owners and planning authorities.

The Town Revitalisation through the Integration of Vacant Buildings into the Circular Economy (TREBUChEt) project has three components:

1. a spatial analysis and morphology classification of vacant and derelict buildings in Irish towns to validate the choice of case study buildings and locations;
2. life cycle assessment case studies for six recently retrofitted buildings and two neighbourhood blocks.
3. a policy review and interview-based study on the existing schemes and incentives for the adaptive reuse of buildings in the three case study towns of Ballina (County Mayo), Tipperary Town and Monaghan Town.

What did the research find?

The spatial analysis component finds that vacant buildings are disproportionately likely to be terraced town buildings that form part of vacant and/or derelict clusters in town centres. These patterns of vacancy and dereliction have important implications for policy transfer and for common template solutions according to use case, morphology, age, methods of construction and renovation history.

The life cycle assessment studies in this project show that the carbon costs of retrofitting town buildings versus constructing new builds are significantly lower and can be reduced further through greater retention of existing elements and low-carbon design choices. Additional carbon savings can be made by scaling to urban blocks, thereby tackling the pattern of systematic vacancy in Irish town centres with greater urgency.

Further consideration can be given to promoting the liveability and attractiveness of towns and to community planning. Awareness of existing grants was high, and the barriers to adaptive reuse highlighted included physical accessibility, ad hoc modifications, the legacy of outmigration from town centres, legal issues, a lack of data and the need for further resources to help and guide owners.

How can the research findings be used?

The methods developed as part of TREBUChEt and adjacent projects are being integrated into training programmes for future urbanists and building engineers.

The life cycle assessment results and methodology in this project can be further developed to support national policies on retrofitting, taking account of the carbon savings possible in the broader context of Ireland's sectoral emissions targets for the built environment.

By further developing life cycle assessment for retrofitting, it may be possible to link restoration grants to low-carbon choices of materials and renovation pathways for town buildings. Furthermore, the results from this project support those working towards low-carbon adaptive reuse of heritage buildings in town centres and those more broadly involved in Town Centre First planning.

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