

## **ABSTRACT FROM FOREST TO HERITAGE**

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In line with the Green Deal, the European Union aims for carbon neutrality and circularity through building renovation and the use of secondary and bio-based resources. As a major consumer of resources and producer of waste, the construction sector must therefore be fully involved. In Wallonia, where construction accounts for 39% of waste, large-scale renovation of historic buildings, often considered energy-inefficient, produces significant material flows. From an *Urban Mining* view, these flows represent a reusable deposit, notably historic timber, valued for its durability and cultural value. However, its reuse remains limited due to regulatory and normative barriers, driving its end-of-life management mainly toward energy recovery.

The research has 3 objectives: (1) demonstrate that historic timbers are adapted for reuse as structural application in construction and/or rehabilitation; (2) strengthen timber reuse through the protocol development ensuring both technical performance and heritage value; and (3) propose reuse scenarios questioning the current regulatory framework. The corpus focuses on Liège's 19<sup>th</sup>-century houses, remarkable for the richness and quality of its wooden frameworks.

The methodology includes: (S1) Creation of a technical dataset based on architectural and archaeological analysis of five case studies documented by digital statements. (S2) Development of the technical part of the protocol, based on visual classification and statement methods specific to archaeology field, supplemented by mechanical tests. (S3) Development of heritage quality assessment using a grid of cultural, historical, and constructive criteria. (S4) Protocol testing and validation with reuse professionals. (S5) Proposal of reuse scenarios that align with normative constraints, technical performance, and heritage values.

Innovation of this interdisciplinary research, combining building archaeology, structural engineering, circular construction and reuse, lies in new insights into 19<sup>th</sup>-century carpentry and in a protocol divided in two complementary parts, which can be mobilised according to professional needs, to support reuse practices and circularity in the wood industry while articulating constructive memory and architectural innovation.