DESCRIPTION FOR THE GENERAL PUBLIC

The urbanized environment requires the rapid introduction of strategies for reusing raw materials and elements that would solve the problem of wasted resources and high emissions of adverse substances. This is a problem that already requires action. Trends such as urban mining (involves the recovery of valuable raw materials from used products, installations, buildings) or adaptation for reuse (adaptive reuse) are limited by the lack of quality assessment procedures, which increases the risks for the construction industry. Therefore, a re-certification procedure based on the reliable, replicable, and feasible condition assessment methodology of reclaimed/in-built timber is needed.

The reuse of existing buildings or their components currently has the greatest potential to reduce the construction industry's carbon footprint and reduce the need for new raw materials. The Ti-ReX project aims to improve the sustainability of the construction industry by enabling widespread reuse of load-bearing wooden structures both in the original building with the same or changed configuration and in other buildings.

Wood elements in buildings can have several uses, such as load-bearing, stabilizing, fire prevention, thermal and acoustic insulation, and aesthetics. Before using wood as a load-bearing element again, its structural and fire protection properties must be verified, as sustainability requirements must not compromise safety. Currently, no practical method is available to comprehensively assess the end-of-life performance of a wood product.

The key objectives of the proposed Ti-ReX project are:

- identification of a set of non-destructive tests (NDT) best suited for comprehensive and effective assessment of wood condition (i.e., density, stiffness, strength, fire resistance, moisture content, defects, fiber direction) that can be performed both in-situ and under laboratory conditions,
- developing a procedure for post-processing NDT data to obtain the highest informational value and quantitative risk assessment,
- testing the developed methodology on a real case study of the adaptation of a 5-story wooden office building,
- development of a quantitative closed-loop assessment based on actual potential and a life-cycle assessment procedure for long-life wood products, including quantification of risks for reuse and recycling/recovery.
- documentation and guidelines for reclaimed wood recertification as a basis for European standardization.

The implementation of the project is divided into four basic work packages, implemented jointly by partners from Finland, Norway, Latvia, Slovenia, Spain. Workpackages 1 and 3 focus on data acquisition through laboratory and field tests, while workpackages 2 and 4 focus on data handling, processing, systematization, and value-added through data science and modeling based on both test results from workpackages 1 and 3, external literature sources, data mining, national data sources, and systematic reviews.