

Circular EcoBIM

Enabling a Circular Construction model with
BIM based tools



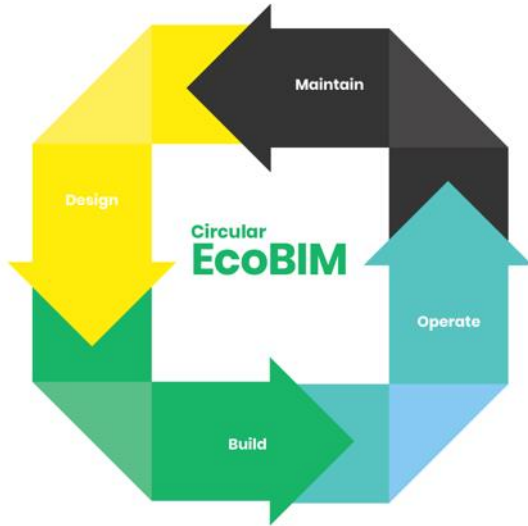
Iceland
Liechtenstein
Norway grants

Operador do Programa:



Parceiros:





Background

- The construction sector was identified as a key sector to achieve a circular economy, as described in the Plan of Action for the Circular Economy.
- Circular construction aims to increase the amount of material that can be recovered, reused and recycled at the end of life of the building or its elements.
- For an improved environmental performance, the implementation of circular economy strategies, requires a life cycle perspective. This integrates the building design, material choice, and the related environmental impacts.
- Considering the long lifespan of a building, this perspective has to be supported by an information system that includes information of the construction, use, rehabilitation and decommissioning phase. Nowadays, it is possible to do so by using **Building Information Modeling (BIM)**.

Objectives

- The Circular EcoBIM project aims to **create a BIM platform that integrates a database and a set of plugin applications to promote the reuse, recycling and recovery potential of building materials**, while considering the related environmental impacts of these activities. The plugins will allow the calculation of circularity passports of buildings and their components, as well as the calculation of LEVEL(s) system indicators for buildings. In this way, the project contributes to the implementation of circularity strategies in construction. A closed material cycle can only be enabled by identifying end of life destinations for all construction and demolition waste (CDW) along the life cycle of a building.
- Moreover, a Product Data template, i.e. a data structure for BIM objects based on the Uniclass classification scheme, will be defined and used to create a database for environmental impacts (mid-point) of construction products. The database will consist of a selected inventory of products that are used for the construction of the core, shell, and external works of a building.
- The database and plugins will form part of the Circular EcoBIM Platform, along with a **communication and management interface and a 3D interface for viewing circularity indicators** in an integrated way with the building model.

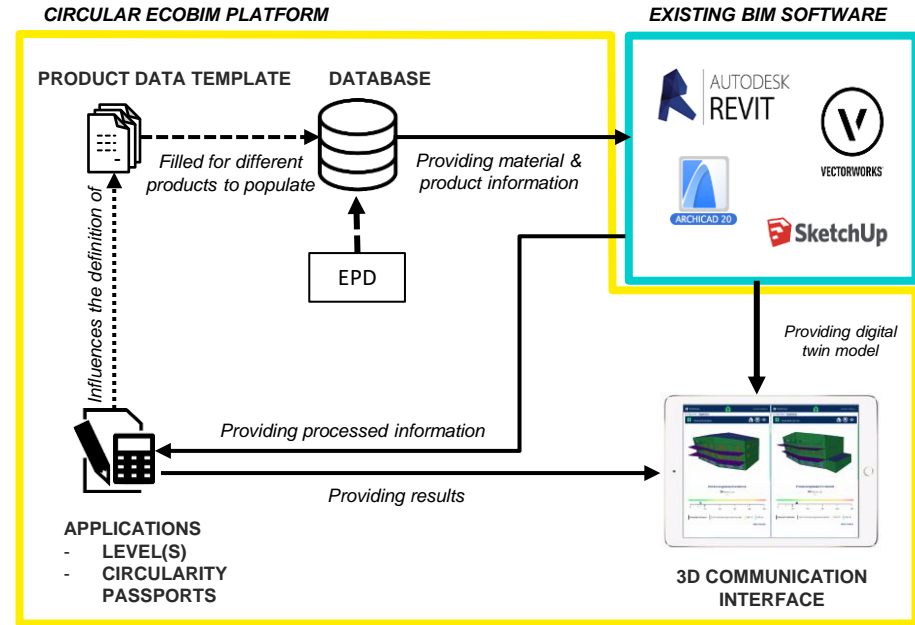
Objectives

- During the demonstration phase, we intend to accompany different construction projects as case studies. The goal is to **demonstrate the economic and environmental advantages of employing the Circular EcoBIM platform**, which will be used to integrate the circularity metrics in the various life cycle phases of the project.
- Moreover, a methodology based on **Material Flow Analysis** will be applied to at least one of the case studies, which will help uncover further challenges for closing the material cycle.



Overview of the Circular EcoBIM platform

- The platform will consist of multiple components that interact with existing BIM software.
- A 3D communication interface will illustrate circularity indicators and information regarding the design for disassembly of buildings, their elements and components.



.....▶ Manual information flow

————▶ Automatic sequence flow

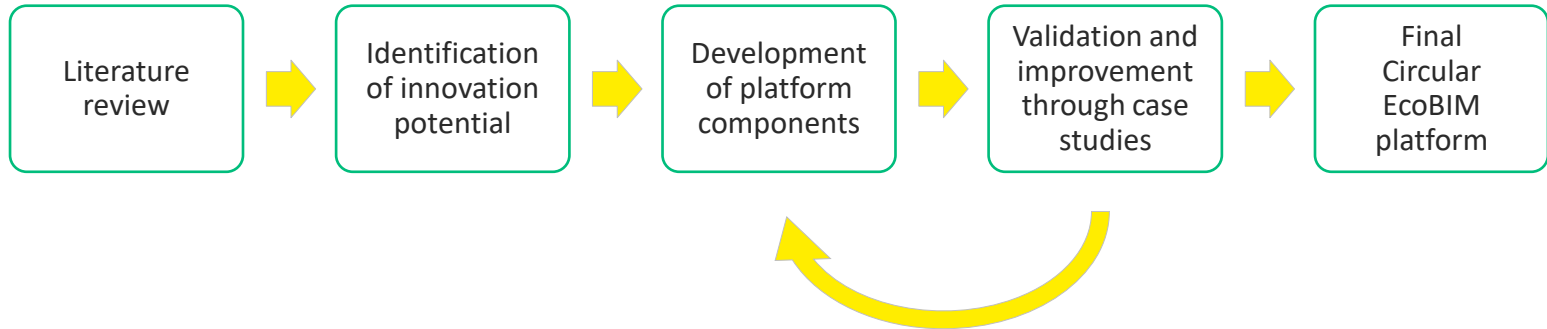
Partners

3drivers



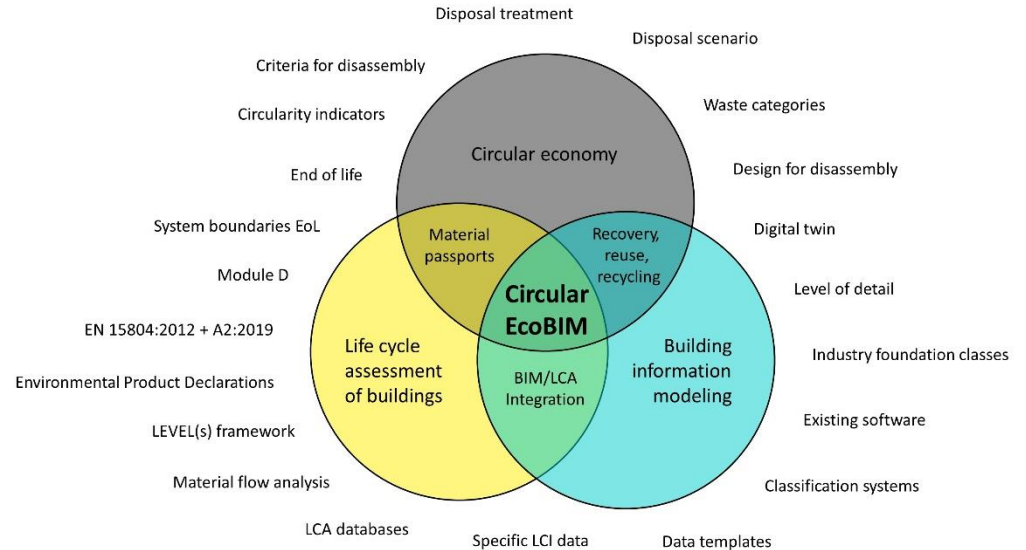
- **3drivers**, **IN+ (IST)** and **NTNU** will contribute with their knowledge and experience in the area of circular economy and life cycle assessment, while **Central BIM**, **CERIS (IST)** and **Atelier dos Remédios** will contribute through their experience in the fields of architecture, civil engineering and BIM.
- The consortium will also benefit from having **Potential Sketch**, a company by **VIC Properties**, as a partner. They will be particularly focused on the development of the demonstration project and the integration of tools in the buildings' life cycle.

Methodology



Contribution to the state-of-the-art

- The Circular EcoBIM platform pushes for a circular construction sector by combining the “Circular Economy” school of thought with the powerful tools “Life Cycle Assessment” and “Building Information Modeling”
- This requires a thorough literature review of current trending topics that are related to these themes



Expected results

The Circular EcoBIM project wants to promote and facilitate circularity practices in the construction sector. Therefore, we propose a user-friendly BIM platform that provides plugins and the necessary data. BIM is a robust and efficient working technology that is increasingly becoming popular in the sector.

Increase the application of Circular Economy principles in the construction sector

The project will enable the development of a new generation of BIMs that incorporate information on the circularity potential of materials and components and hence the entire building. The integration of circularity concepts into the rapidly growing BIM technology, which is on the way to becoming a common practice in the construction sector, will also enhance the growth of the circular economy in this sector;

Increase the resource efficiency in the construction sector

The Circular EcoBIM project will allow the calculation of aggregated circularity indicators, but also map opportunities for better resource management at different stages of the building life cycle, promoting the prevention of waste and the incorporation of secondary raw materials in the sector itself or in other sectors. Publication of the technical gains and the environmental and economic benefits associated with the proposed approaches will also contribute to increasing the efficiency of the entire sector.

About EEA grants

Iceland, Liechtenstein and Norway are partners in the internal market with the Member States of the European Union through the Agreement on the European Economic Area (EEA). In order to promote a continuous and balanced strengthening of economic and trade relations, the parties to the EEA Agreement have established a multi-annual financial mechanism, known as the EEA Grants.

The EEA Grants aim to reduce social and economic disparities in Europe and to strengthen bilateral relations between these three countries and the grants' recipient countries.

For the 2014-2021 period, a total contribution of € 2.8 billion was agreed for 15 beneficiary countries. Portugal will benefit from a budget of 102.7 million euros.

Learn more at eeagrants.gov.pt

For more information, contact us at hello@circularcobim.eu

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Norway grants

Operador do Programa:



Parceiros:



EEA Grants Portugal

Tel: (+351) 218 838 079
Rua Professor Gomes Teixeira, n.º2
1399-022 Lisboa - Portugal
geral@eea-grants.gov.pt

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