Interreg Sudoe

EUROPEAN UNION

IMIP_
Innovative Eco-Construction System Based on Interlocking Modular Insulation Wood & Cork-Based Panels

European Regional Development Fund

WP4 Activity 4.4.1 Report (Representative solutions simulation using Virtual Reality for decision making).

IMIP-SOE3/P3/E0963

Project funded by the Interreg Sudoe programme through the European Regional Development Funds (ERDF)

IMIP_
Interlocking Modular Insulation Panels

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PROJECT CONTEXT

Project acronym	IMIP
Project title	Innovative Eco-Construction System Based on Interlocking Modular Insulation Wood & Cork-Based Panels
Project code	SOE3/P3/E0963
Coordinator	Universitat Politècnica de València (UPV), Instituto ITACA
Duration	1 May 2020 – 31 April 2023 (36 months)
Working Package (WP)	WP.4
Technical Report	GT.24 D 4.4.1.
Delivery date	4/2023
WP Leader	UPV
Activity coordinator	UPV
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CONTENT

INTRODUCTION

The work is contemplated in the IMIP project of the INTERREG SUDOE Program, within Working Group 2: (GT2 Design and manufacture of interconnected modules)
These works focus on the development of modules and construction systems to be used in rehabilitation and new construction.

In this report, the systems and materials that are currently being implemented and used that have natural cork and wood as raw materials are analysed. The purpose is to analysis of existing compatible construction systems to be analysed with the IMIP project.

The study is carried out within the scope of the Interreg Sudoe territories and we will focus more specifically on Portugal, France and Spain.

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Table 1: Programme and Project objectives and results.

Programme specific objective	To improve energy efficiency policies in public buildings and homes through the implementation of networks and joint experimentation.
Project main objective	To support the change towards a low carbon economy using bioproducts (wood and cork) for smart, sustainable, and inclusive growth with a special focus on the public construction sector.
Project specific objectives	To design, validate and implement a new ecological construction system to improve energy efficiency in public buildings. Related activities are: - To design an ecological construction system based on innovative wood and cork products supporting a low carbon economy, - To test prototypes, - To develop an Information and Communication Technology for design, modelling, and evaluation of potential construction solutions, - To compare the modular and interconnected insulating panels designed with currently used insulating panels, - To disseminate results and to train prescribers.
Programme result indicator	Percentage of actors in the energy efficiency sector participating in transnational cooperation projects.
Project results	An interconnected modular system of insulating panels made of wood and cork to improve energy efficiency of buildings, including their entire life cycle. A BIM plug-in to analyse the environmental benefits of bioproducts used in construction (carbon storage and substitute effect) + Virtual Reality.

OBJECTIVES

The job consists in:

- After the elaboration of the 3D BIM models destined for virtual reality, in which the construction details and specificities of the IMIP project are integrated in a building, the investigation is carried out in the environment of the tools of VIRTUAL REALITY and METAVERS to be used both for the process of creating the models and for the process of the utilities for visualization.

This process can help in the way of develop and improve the final design of any architectural project and its interaction in the virtual reality and in the metavers.

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OBSERVATORI SOSTENIBILITAT D'ANDORRA

PRINCIPLES AND DERIBERABLES

-Mapping of materials and information of the model and its component, on characteristics and properties of the model elements and their modes of interaction have been carried out.

- Have been created the compatible files prepared for viewing in a web environment, video, and interactive 3D models.

The work deliverables are:

- Video viewable from web environment with a demonstration of the operation of Virtual Reality.

- Link to a Virtual Reality Visualization environment in the web environment of the 3D model

They are also delivered:

- The IMIP project specific mapping textures and their materials.

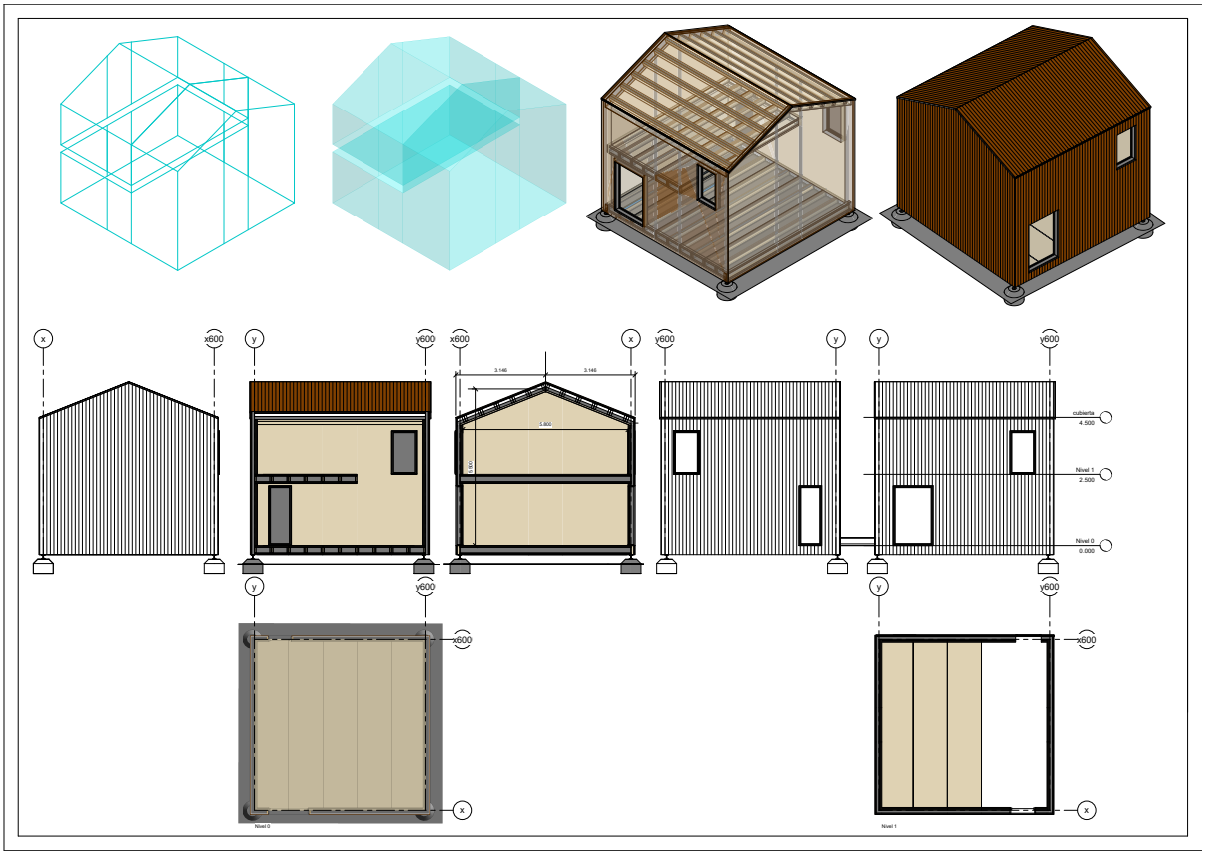
- Volumetric IMIP BIM documents

A. BIM

A BIM (building Information modelling) has been made with all the specific characteristics of the IMIP project, compatible with all the utilities developed on the IMIP project, such as:

-Export .ifc model file of the original BIM model for processing in the IMIP project appweb

-volumetric model mapped and exported through an import file compatible with the free access Virtual Reality and Metavers Spatial platform



B. VIRTUAL REALITY & METAVERS

The virtualized models of the pilot actions in Portugal and Valencia, as well as all the constructive elements developed in the IMIP project, have been developed and transferred to the metavers spatial platform for experimentation both in the virtual world and in the metaverse.

Always allowing free access for the general public to the platform at the following link:

https://www.spatial.io/s/IMIP-639851d70ec80e0001c8217e?share=4082293763439250989

C. MAPPING MATERIALS

The mappings of the real materials used in the construction of the imip systems have been selected in order to virtualize the bim models both in a virtualized environment and in the metaverse.

Materials are:

-Wood of maritime pine in the formation of the CLT IMIP boards.

- ventilated façade based on pinaster pine wood with shou shugi ban burned treatment + protective lasur

FINAL CONCLUSION

We can affirm that an integrative way of working based on BIM technology and .ifc export files for work process in virtual reality spaces, in the imip appweb, as well as in the metaverse, help decision-making by saving up to 25 % in decision-making times and in spatial understanding of the proposals.

On the other hand, this work methodology adapts to new technologies. The metaverse is implemented as a way of integrating into the virtual and the immersive world that can help people better understand the improvement proposals of the IMIP project.

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