

WP5 Activity 5.1. Report (Portugal Pilot Action).

IMIP-SOE3/P3/E0963

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







PROJECT CONTEXT

Project acronym	IMIP
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Project code	SOE3/P3/E0963
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Technical Report	GT 5 5.1.
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WP Leader	ISA
Activity coordinator	AAE
Main authors	Principal Investigator: José Vicente Oliver Villanueva Technical Director : Salvador Gilabert Sanz
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Payer Customer	AAE





PARTNERS







Universitat Politècnica de València Instituto Universitario de las Tecnologías de la Información y Comunicaciones Information and Communications Technologies versus Climate Change

Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria, O.A., M.P - Centro de Investigación FORestal -Departamento de Dinámica y Gestión Forestal (INIA-CIFOR)

Institut Technologique Forêt Cellulose Bois-construction





Asociación Clúster de la Construcción Sostenible de Andalucía (ClusterCSA)

Ameublement (FCBA)



Asociación de Investigación Técnica de las Industrias de la Madera (AITIM)

JUNTA DE ANDALUCIA

Agencia Andaluza de la Energía CONSEJERÍA DE HACIENDA, INDUSTRIA Y ENERGÍA

Agencia Andaluza de la Energía (AAE)

INSTITUT VALENCIÀ de l'EDIFICACIÓ INSTITUTO VALENCIANO de la EDIFICACIÓN



INSTITUTO SUPERIOR D AGRONOMIA Universidade de Lisboa



UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH Instituto Valenciano de la Edificación Fundación de la

Instituto Superior de Agronomia (ISA)

Comunitat Valenciana (IVE)

Universitat Politècnica de Catalunya (UPC)



Pôle de Compétitivité Xilofutur MAT FORETS CULTIVEES



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INTRODUCTION

The work is contemplated in the IMIP project of the INTERREG SUDOE Program, within Working Group 5 -GT5 (pilot actions)

These works focus on the construction of the Pilot Action Construction as a demonstration of the IMIP 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.





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

This report consists in:

- Determine the final status of the Pilot action called "Portugal"

This report controls the construction and the final design of the Portugal architectural project.





PARTNERS













Agencia Andaluza de la Energía CONSEJERÍA DE EMPLEO, EMPRESA Y COMERCIO







ASSOCIATED PARTNERS







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BACKGROUND

The Andalusian Energy Agency (hereinafter, Agency), created by Law 4/2003, of September 23, is a public business agency by virtue of the provisions of Decree 217/2011, of June 28, on adaptation of various Public Law entities to the provisions of Law 9/2007, of October 22, on the Administration of the Junta de Andalucía, and is currently attached to the Ministries of the Presidency, Public Administration and Interior, and to the Treasury and European financing.

Among the lines of action of the Agency is the promotion of the participation of Andalusian companies and institutions in state and international energy programs. To this end, the Agency actively participates in different programs and projects of the European Commission, such as the IMIP project.

The IMIP project, "Interlocking Modular Insulation Panel", framed in the INTERREG SUDOE program, has as its general objective to develop an ecological construction system based on natural resources such as cork and Mediterranean pine wood to improve energy efficiency in public buildings. More specifically, IMIP has as specific objectives:

• Using the forest economy to play a relevant role in improving energy efficiency in public buildings and homes in South West Europe (France, Spain and Portugal).

• Support regional development in rural areas.

• That the public sector take the initiative and develop new policies focused on improving energy efficiency in public buildings using local bioproducts, understanding the current situation of forests and the value chain of bioproducts, based on the characteristics of the wood and cork sectors of South West Europe, and the functional and technical requirements of selected wood and cork-based products, this roadmap defines a set of policies and strategies intended to guide policy makers towards a increased use of wood and cork in public buildings in southwestern Europe.

The SUDOE IMIP project is co-financed by the Interreg SUDOE Program and the European Regional Development Fund (FEDER), and has a budget of 1.3 million euros (75% paid by the European Commission) and a duration until April 2023.





The project partners are:

- Universitat Politècnica de València.
- Instituto Universitario de las Tecnologías de la Información y Comunicaciones.
- Information and Communications Technologies versus Climate Change-

- Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria, O.A., M.P - Centro de Investigación Forestal - Departamento de Productos Forestales (INIA-CIFOR).

- Institut Technologique Forêt Cellulose Bois-construction Ameublement (FCBA).
- Universitat Politècnica de Catalunya (UPC)
- Asociación de Investigación Técnica de las Industrias de la Madera (AITIM).

Agencia Andaluza de la Energía (AAE).

- Instituto Valenciano de la Edificación Fundación de la Comunitat Valenciana (IVE).
- Instituto Superior de Agronomia (ISA).

- Pôle de Compétitivité XYLOFUTUR XYLOFUTUR PROD MAT FORETS CULTIVEES (Xylofutur).

Within the framework of the IMIP project, the Andalusian Energy Agency is responsible, among others, for activity Wp.5

OBJECT OF STUDY

The purpose of this document is to define the state of the, correct assembly-disassembly, transport and re-adaptation of the "Portugal" Pilot action.

These solutions consist of prefabricated wooden panels and insulation made of natural materials for the development of construction systems in new construction and rehabilitation buildings.





INITIAL TECHNICAL SPECIFICATIONS

"The work to be carried out consist of the correct assembly and assembly of the building prototype of 2 m x 3 m base and 2.75 m high with a slope of 42% to a water, from the construction systems supplied by the IMIP project. These systems consist of CLT boards and cork insulation for façades, a roof made of composite CLT sandwich panels and CLT natural and wrought cork insulation in the form of a box with natural cork insulation, according to project details. All the special anchors that allow the assembly and disassembly of the building will be included, as well as the fittings for the foundations and machining for the exterior carpentry consisting of doors and windows, waterproofing sheet on the roof and facades, as well as the finishing of the facade with wood. 21 mm thick pine with burnt treatment for exterior wood type Shou Sugi Ban and decorative lasur layer. Assembled in the workshop, it will include transport from the workshop to Lisbon and back, its reassembly, perfectly finished and in perfect state of use."

INCLUDED:

- Fittings and screws Mechanized sawn pine wood for facade and exterior treatment
- Supply of waterproofing sheet for roofs and facades
- Doors and windows according to project
- Systems of personal protection and safety and health of workers and operators
- -Auxiliary means and including cranes if necessary for the development of all works
- Transport from Valencia to Lisbon, return and relocation and assembly at the Universitat Politècnica de València

NOT INCLUDED:

- Supply of slab panels, walls and roof (customer provides)

All this in accordance with the technical direction assigned from IMIP, and allowing the necessary adjustments in accordance with the technical requirements of reuse, assembly and disassembly that are deemed appropriate by the technical direction.







Initial Plants and Elevations





TENDER BUDGET

The maximum budget for this contract, for all concepts, is €12.800,0 (VAT included).

This contract is financed by the IMIP project, 75% financed by the INTERREG SUDOE program, charged to the FEDER fund.

OBLIGATIONS OF THE AWARDED COMPANY

The winning company undertakes to provide the service offered, in accordance with the scope of work established in this document.

As many meetings (online mode) as the person in charge of the contract of the Andalusian Energy Agency considers will be held for the correct monitoring of the contracted works.

SUPERVISION AND MONITORING

The Andalusian Energy Agency will ensure the correct execution of the works, for which it may carry out supervision and control tasks at any time. Likewise, the Andalusian Energy Agency may establish certain procedural instructions for the development by the winning company, provided that the future of the works requires it for a better execution and results of the service. These instructions will mainly deal with the following aspects:

- Ensure the correct performance of the work.
- Establish work meetings with the contracted technical team.
- Temporary planning of the works and ensure compliance.
- Determine and enforce the method for performing contracted work.

• Request any type of information and/or additional documentation from the winning company.

Within the functions of management, coordination and monitoring of the works object of the contract, the Andalusian Energy Agency may make as many suggestions and modifications on any of the elements that are considered necessary for the best achievement of the objectives pursued.





PORTUGAL PILOT ACTION STATE

After the site visit carried out to check the final state of the prototype construction in the factory, the suitability of the state of the project is determined and the surfaces finally built are checked, resulting in 2,35 m x 3,34 m base.

The systems have been properly assembled and in accordance with the technical specifications of the project, the pilot action meets the construction and assembly conditions expected.







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FINAL PILOT ACTION CONSTRUCTION

The work done consist of the correct assembly and assembly of the building prototype **2,35 m x 3,34 m base, going from** 6m2 to 7,85 (**30,8% increase in built square meters from initial project**) and 2.75 m high with a slope of 42% to a water, from the construction systems supplied by the IMIP project. These systems consist of CLT boards and cork insulation for façades, a roof made of composite CLT sandwich panels and CLT natural and wrought cork insulation in the form of a box with natural cork insulation, according to the final project details. All the special anchors that allow the assembly and disassembly of the building will be included, as well as the fittings for the foundations and machining for the exterior carpentry consisting of doors and windows, waterproofing sheet on the roof and facades, as well as the finishing of the facade with wood. 21 mm thick pine with burnt treatment for exterior wood type Shou Sugi Ban and protectiuve lasure (open porous varnish for outdoor uses) layer. Assembled in the workshop, it included transport from the workshop to Valencia UPV, its reassembly, perfectly finished and in perfect state of use.



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Final constructed project details

FINAL BUDGET

Due to the adjustments in execution times, in the construction systems and details of the project, there have been differences with the initial proposal:

- The measurements of the prototype have not been the same as those that were being contemplated in the specifications, but have been greater because the construction systems supplied have been greater and it has had to be adjusted. It has gone from a 2x3 m prototype to 2.35x3.34 m, thus existing an excess in the surface of 30.8%

- It has had to add boards that were not contemplated for the cork insulation that were not contemplated in the initial design for the assembly and disassembly of the structure to be successful.

Considering the 30.8% increase in area, the budget increases:

- Supply of materials except floor, façade and roof panels (supplied by the IMIP project)

€4.348,50 **+ 30,8%** = **€5.687,84**

- Ud. Assembly and disassembly of prototype (including auxiliary means), Discarding Lisbon assembly part €3.250 - 700 = 2.550 + 30,8% = €3.335,4

Considering the transport and assembly executed, the budget decreases

- Transport and assembly Lisbon-Valencia €2.980,0 - 1.500,00 = €1.489,0

TOTAL without Taxes = €10.512,24 TOTAL with Taxes = €12.719,81

Final Amount pass from the Tender €12.799,99 due to the cancellation due to lack of time of the transport of the Pilot action to Portigal, leaving a total amount of €12.719,81 Taxes included.





FINAL CONCLUSION

In relation to the technical aspect of the Portugal pilot action, we can affirm that the manufactured and assembled prototype has been carried out in accordance with the required technical specifications and responds perfectly to the research of the IMIP project for the development of Innovative Eco-Construction System Based on Interlocking Modular Insulation Wood & Cork-Based Panels from the sudoe region.

There has been an increase in the constructed area finally executed by 30.8%. This increase has been due to the adjustments and supply of construction systems that have evolved during the course of the project and that have been supplied to the company awarded the packaging and final construction.

There has been a delay in the assembly of the Pilot action derived from the delay produced in the manufacture of several of the CLT walls involved in a contract unrelated to the contracting of the assembly, disassembly, transport and reassembly of the same, for which the delay produced in this action is not attributable to the winning company. Likewise, the delivery of this pilot action is inside the delivery deadlines of the IMIP project.

It must be said that in the end the transfer to Portugal has not been carried out because that would delay the final delivery of the project within the required deadlines. But the purpose of developing and building a system that allows it to be assembled, disassembled, transported and reassembled, has been carried out from workshop to Universitat Politècnica de València with the expected result, being a complete success for the IMIP project.