02

LIFE EcoTimberCell

Bulletin LIFE EcoTimberCell

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Our world is changing and

the way we build as well

With the contribution of the LIFE financial instrument of the European Union

Content

Introduction

This bulletin is dedicated to detailing some of the early work of the LIFE EcoTimberCell project, specifically:

- Local Timber Characterization
- Characterization of the Betanzos HB board (Tablex)
- Fire reaction tests and obtaining application parameters for structural adhesives

Local Timber Characterization

Timber has variability in its properties, not only depending on the species, but also on local environmental conditions and applied forestry techniques. For this reason, it is essential to know the properties of the pieces used to make the prototypes, and thus control the variables that influence the tests.

Characterization of the Betanzos HB board

The characterization of the board seeks to obtain the characteristic values of its strength and stiffness properties through a set of standardized tests.

The board used by the EcoTimberCell is a TABLEX, manufactured by the LIFE EcoTimberCell project member Betanzos HB, which is a high-density fibreboard with one smooth and one rough side.

Fire reaction tests and obtaining application parameters for structural adhesives

In building elements, reaction to fire performance is a key parameter for which there are established standards for analysis and to ensure compliance with regulations and safety in this area.

On the other hand, there are a large number of adhesives for timber and derivatives on the market. Since the range of products and possible uses is very wide, it is necessary to limit the range of adhesives to those suitable for structural uses, with the required resistance performance.

All this with local timber from sustainably managed forests.

Local Timber Characterization.

The use of timber in structural applications is preceded by a classification under the parameters of strength, stiffness and density.

The high variability in the properties of the different species and origins makes its classification a complex task. For this reason, the need arose to create a classification system based on different ranges of mechanical properties, called resistance classes. A resistant class is defined by a series of physical and mechanical properties of the timber, in which populations or lots of timber with similar properties can be included.

The strength classes are standardised at European level and are defined in the standard EN 338. The assignment of a strength class to a batch or stock of structural sawn timber requires prior characterisation to determine its mechanical properties with the appropriate safety margin.

This characterisation normally consists of a visual classification under the parameters of the **UNE 56544** (coniferous timber) and **UNE 56546** (hardwood) standards for a Spanish origin.

The standard that relates visual classification to strength classes is **EN 1912**.

For Spanish timber we can find:

- **C30**

ME1 Austrian pine (*Pinus nigra*)

- **C27**

ME1 Scots pine (*Pinus sylvestris*)

- **C24**

ME1 Radiata pine (*Pinus radiata*)
ME1 Maritime pine (*Pinus pinaster*)

- **C22**

MEG Scots pine (*Pinus sylvestris*)
MEG Austrian pine (*Pinus nigra*)

- **C18**

ME2 Radiata pine (*Pinus radiata*)
ME2 Maritime pine (*Pinus pinaster*)
ME2 Austrian pine (*Pinus nigra*)
ME2 Scots pine (*Pinus sylvestris*)

- **D40**

MEF Blue gum (*E. globulus*)

Annex A (informative) of UNE 56546 contains the values for eucalyptus and chestnut timber:

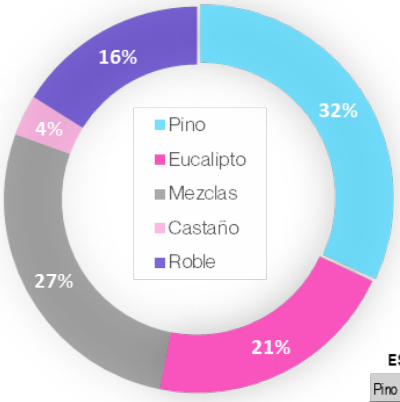
- **Eucalyptus MEF** (sección máx. 60x200)
  $f_{m,k} = 47\ N/mm^2$
  $E_m = 18400\ N/mm^2$
  $\rho_k = 672\ N/mm^2$
- **Chestnut MEF** (b≤. 70 mm)
  $f_{m,k} = 28.1\ N/mm^2$
  $E_m = 12290\ N/mm^2$
  $\rho_k = 510\ N/mm^2$

The locally available timber that intersects with those recognized by the standard are the ones chosen for the study in the project:

- *Pino pinaster*
- *Pino radiata*
- *Eucalyptus globulus*
- Chestnut tree

In this preparatory action a representative sample of the timber being used in the project has been evaluated. The action focuses on the following aspects:

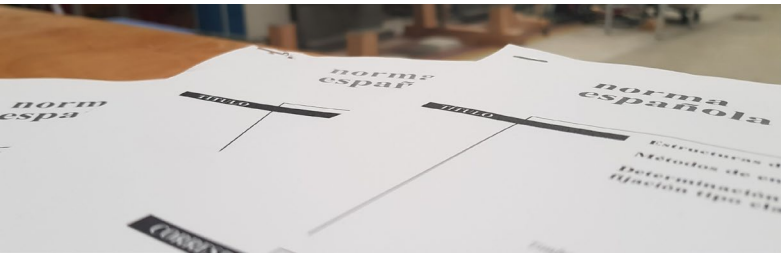
- Visual Classification,
- Non-destructive methods, and
- Mechanical classification.



ESPECIE	Superficie (ha)
Pino	433.954,04
Eucalipto	287.983,79
Mezclas	372.600,19
Castaño	46.455,40
Roble	218.572,35

Gráfico: Superficie por especie forestal en porcentaje.
Tabla: Superficie por especie forestal en ha.
Fuente: Memoria de la cadena forestal-Madera de Galicia 2017 Xera y Uvigo.

Visual Classification

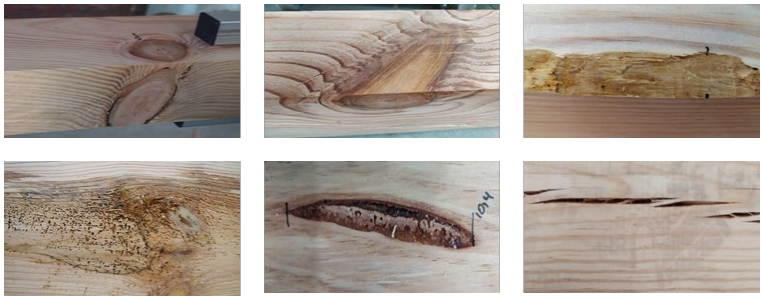


Visual classification may determine that previously classified and strength-graded timber pieces are not valid for structural use due to the existence of singularities in the timber that may affect its properties.

The main singularities or properties of the timber with influence in its structural quality are defined under the indications established in the standard UNE EN 56544 for the timber of *Pinus pinaster* and *Pinus radiata*, and the standard UNE EN 56546 for the species *Castanea sativa* and *Eucalyptus globulus*.

For visual classification, general characteristics (moisture, dimensions and density) and singularities associated with the anatomy of the timber are considered.

The most relevant singularities affecting timber properties are: knots, general fibre deviation, cracking, deformations and



rotting or damage by xylophagous organisms.

Non-destructive methods

Mechanical classification and the estimation of the timber's resistance properties can be carried out through the **association of non-destructive techniques and visual analysis** of the material**. Non-destructive tests imply little or no damage to the sample examined.**

The different non-destructive testing methods are based on the application of physical phenomena such as electromagnetic waves, acoustic waves, elastic waves, emission of subatomic particles, capillarity, absorption or any other type of test that makes it possible to estimate a certain property in the material.

Acoustic methods will be specifically addressed, with the aim of establishing correlations between static tests and sound wave propagation tests.

- Ultrasounds
- Shck waves
- Vibrations

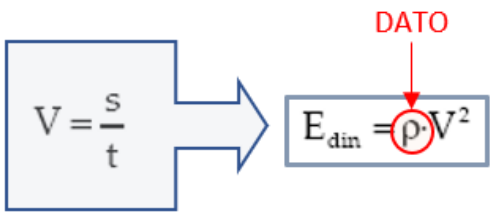
This way, the user is provided with a way to estimate the properties of the structural timber, without the need to submit it to destructive tests.

Knowing t**he speed and density of the timber** we can estimate the dynamic modulus of elasticity (Edin) also called the Stiffness term (CLL), from which we can estimate the **static modulus of elasticity and strength**.

Equipment using the ultrasound technique (USlab) and the shock wave technique (FAKOPP) measure the propagation time of the sound waves in the longitudinal direction of the timber. With the association of time (t) and length (L) of the boards, the speed of sound wave propagation is calculated.




For vibration analysis (MTG and PLG), the natural frequency of vibration of the timber is measured to estimate its resistance properties. The vibration speed is calculated by associating the frequency (f) with the length (L) of the boards.

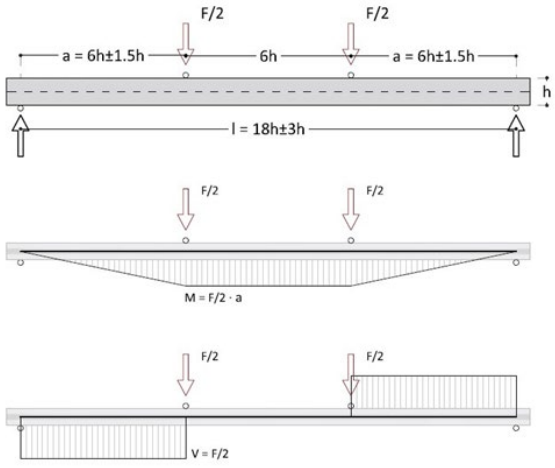


Mechanical classification

In order to obtain the material's resistance parameters, standardized tests are carried out. The standard **UNE-EN 408: 2011+A1** establishes the methodology to be followed to mechanically characterise sawn timber and glued laminated timber for structural use.

Through these tests it is possible to obtain, among other parameters, the local and global modulus of elasticity in bending, the tensile strength parallel to the grain and the resistance to axial bending.

From the values of the global modulus of elasticity, bending strength and density obtained, the characteristic values are calculated by applying correction equations according to the UNE-EN 384 standard



Using as input parameters the mean characteristic value of the bending modulus of elasticity, the 5th percentile characteristic value of the bending strength and the 5th percentile characteristic value of the density, the corresponding **strength class** as defined in EN 338 is assigned.

Within the LIFE EcoTimberCell project, we seek to obtain a correlation of parameters to complement and improve the objectivity of the classification, making it possible to reach a definitive assignment of a resistant class of timber.

The USC has developed a process for the characterization of timber, which firstly takes into account the singularities of the material through a visual classification and mechanical properties independently, with the realization of experimental tests applying non-destructive and destructive methodologies. Carrying out the tests in the **Laboratory of the Platform of Structural Engineering of the Wood** (**PEMADE**), accredited by ENAC according to UNE-EN ISO/IEC 17025:2005 for the Industrial Sector with Accreditation Nº 1248/LE2380, specialized in mechanical tests for the evaluation of the mechanical properties of the different materials used in construction.

Characterization of the Betanzos HB board

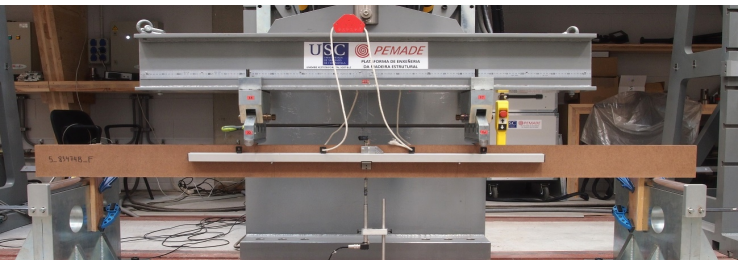
This action of the LIFE EcoTimberCell project, involved the characterization of the hardboards of the company Betanzos HB according to the UNE EN 789 standard, with the main objective of knowing better the existing board, looking for the strong and weak points in order to adapt as much as possible its performance to the obtaining of the structural cell.

Characterizing the board consists of performing a series of tests to obtain its stiffness properties and the characteristic value of its resistance properties.

For the characterization, **28 TABLEX boards** have been used with the following characteristics:

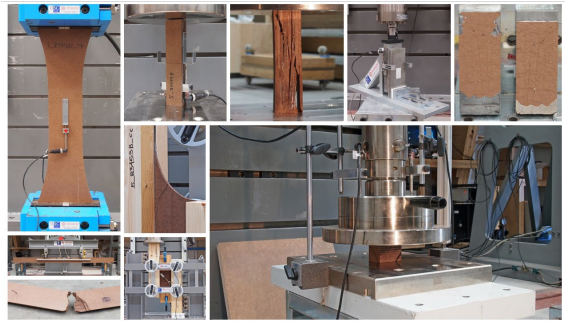
Board Thickness (mm)	Units	Board dimensions (mm)
3,2	4	2440x1220
4,8	4	2440x1220
5,4	16	2440x1220
5,4	4	2920x1220

Mechanical tests



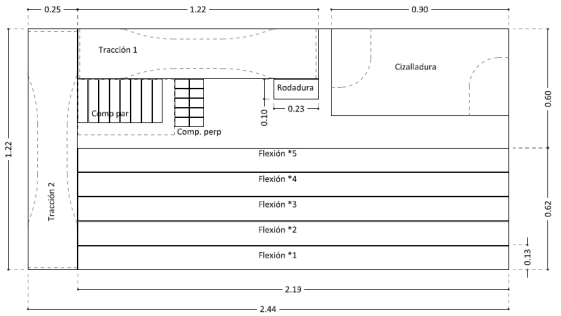
From each board, probes are obtained to carry out the following tests:

- Tensile test (UNE EN 789)
- Parallel compression test (UN EN 789)
- Perpendicular compression test (UN EN 789).
- Rolling shear test. (UNE EN 789)
- Shear test. (UNE EN 789)
- Edge bending test (UNE EN 408)



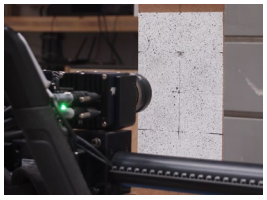
Below is an example of the distribution of the cutting on the 2440x1220 mm board.

Once the sampling of the boards has been carried out, the corresponding quartering of the samples is proposed on them, so that each part of the board has the same probability of being chosen to obtain the probe. Once the specimen has been cut, it



is placed inside the climatic chamber to be prepared..

A **photogrammetric analysis** (**Aramis 3D**) was also carried out in the tensile test. This technique allows to make a correlation of images taken during the test and to obtain the displacements of any point of interest. Thus, **the Poisson coefficient of the probe is obtained**.

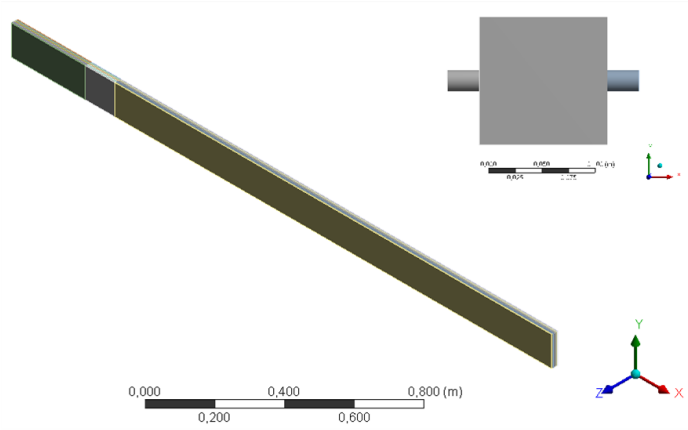


After carrying out the tests and the individual analysis of the results of each of them, **an average density of 1041 kg/m^3**, concluding:

- The **pronounced orthotropy detected**.
- The s**tiffness values in the longitudinal direction** are better than those given by EN 12369-1 for hardboards. In the transverse direction it drops slightly, but remains in the order of those given by the standard.
- The **strength values in the longitudinal direction for tension and compression** exceed the proposed characteristics, but not in the transversal direction. On the other hand, the shear values in the thickness and in the plane do not reach these values.

Non-destructive methods (wave propagation)

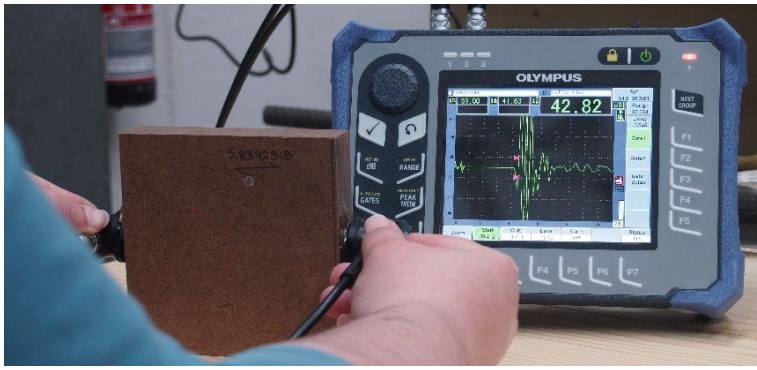
Ultrasound wave propagation tests were performed on square specimens (120 x 120 mm) obtained from the parts tested in bending, from the area not damaged in the test. The initial 300 mm of the beam end were removed as shown in the image.



The longitudinal and transversal directions of the probes were identified and the ultrasound measurements were made in both directions of the probes.

It should be noted that the ultrasound tests are also able to identify the orthotropy of the boards. **The values obtained for the longitudinal direction of the boards are 18% higher than those obtained for the transversal direction**.

Although the values obtained by the ultrasound technique are different (greater) than the values obtained through the static tests (compression, traction and flexion), **the low values of coefficients of variation that were obtained in the proposed relationships show that it is possible to obtain correction factors that allow the inference of the static parameters from data derived from the non-destructive tests**.



Possibilities for improvement

Once the results of each of the applied methodologies have been evaluated, the following actions for the improvement of the panels are defined for their optimization and application in the EcoTimberCell.

Improvement of the properties through modifications in the manufacturing process, taking into account the economic viability of the final product.

Specific improvement of the shear resistance in the plane by working on the rough surface of the board which is weaker due to its lower density.

Improvement of the properties by reduction of the variability, by ultrasounds and mechanical tests to detect this weaker zone and to decide if discarding a zone of the board causes a considerable improvement.

Improvement by increasing the thickness of the board, evaluating in each case the influence on the improvement of CTE performance.

Study of the boards improved with the wave propagation technique since it can be used as a previous classification technique.

Improvement of the board under wet conditions since it can increase the possibilities of application, and the durability of the product.

Fire reaction tests and obtaining application parameters for structural adhesives.

Reaction to fire performance is a key aspect of any building element. These performances are defined according to two normative tests: **flammability** and Single Burning Item (SBI test).

From the laboratory of the **Centre for Forestry and Wood Technology of Asturias (CETEMAS)**, they carry out the tests of the first type, in accordance with the UNE EN 11925 standard, which serve to pre-select the products with the best performance before carrying out the SBI certification in a laboratory accredited for this type of test.

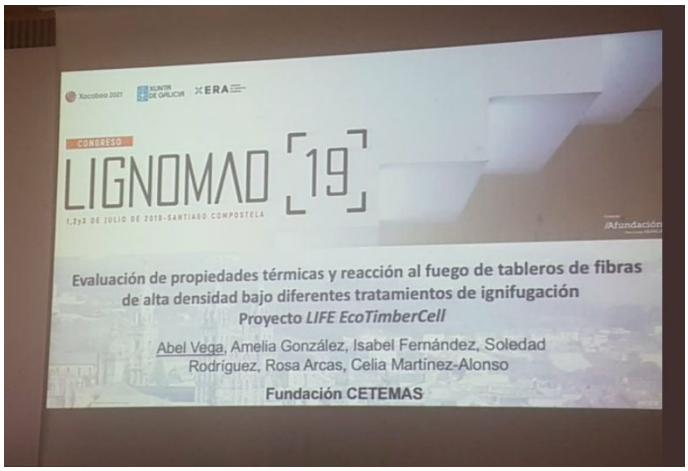
Within CETEMAS' internal test protocols, other aspects beyond the minimum required by the flammability standard are evaluated, so that fireproofing products or applications can be studied in greater detail by evaluating parameters such as mass loss or carbonization depth.

On the other hand, and referring to the **study of adhesives in timber products and derivatives**, it is necessary to carry out differential scanning calorimetry (DSC) tests on different adhesives and timber-adhesive systems. The technology available, as well as the technical experience in this field, allows the definition of the optimal parameters for the application of adhesives on different timber-derived products through the study of the cure rate and time or the optimal application temperature.

CETEMAS' capabilities in both areas (reaction to fire studies and evaluation of adhesives) allow for interesting approaches to the development of EcoTimberCell structural systems, both from the point of view of fire behaviour and the performance testing of the ecological lignin adhesive proposed in the project.

Conclusions of thermal conductivity and reaction to fire tests

As a fundamental element within the EcoTimberCell structural system, the high density board manufactured in Betanzos HB has been evaluated in terms of reaction to fire, also applying different fireproof treatments to improve its performance. A total of nine fireproof products have been evaluated on the board, based on different formulations and application methods. The results will allow for the selection of the most suitable product for its final use in the EcoTimberCell system, maximizing performance in a fire situation, and the assignment of a standard Reaction to Fire class.

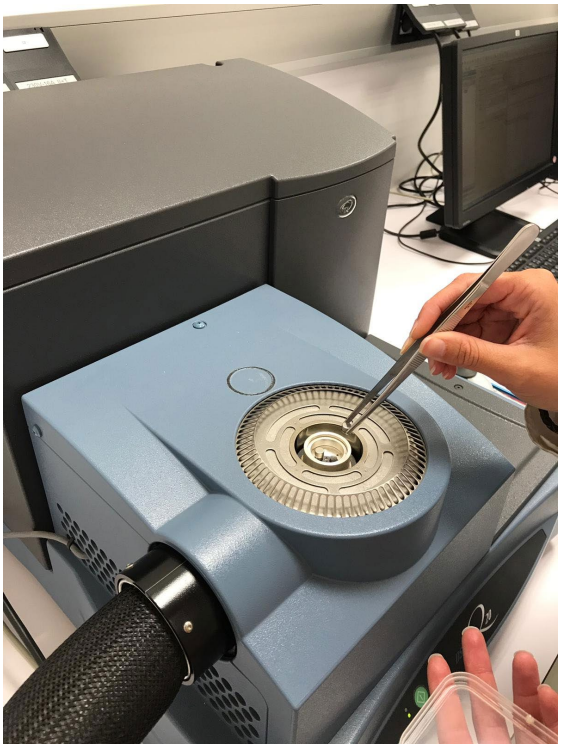


The results of this reaction to fire study were presented at the Lignomad Congress, held in July 2019 in Santiago de Compostela.

On the other hand, the thermal performance of the board has been experimentally defined by determining the thermal conductivity. These parameters will allow, in later phases, the calculation of the thermal transmittance of the complete EcoTimberCell system.

Characterization of the ecological lignin adhesive in LIFE EcoTimberCell

Tests are carried out using differential scanning calorimetry (DSC) on the environmentally friendly lignin-based adhesive to be used in the EcoTimberCell structural system. These studies will allow to know the intrinsic behavior of the adhesive, and to compare it with commercial structural polyurethane adhesives. In addition, at this stage, traction tests will be conducted on boards glued with said adhesive, in order to obtain the mechanical resistance and compare it with that of commercial adhesives and evaluate its suitability for use in ETC cells..



News

Visit of the Regional Ministry of Industry and the Forestry Industry Agency to Pemade

[18/02/2019]

On Monday 18 February, Francisco Conde, Councillor for Economy, Employment and Industry of the Xunta de Galicia, and Ignacio Lema, director of the Galician Forest Industry Agency (Xera), visited PEMADE's facilities at a meeting to promote the creation of a space that generates added value to Galician timber.

The Director of PEMADE, Manuel Guaita, offered the counsellor and those attending the visit a detailed explanation of the educational and R&D&I activity carried out here. He detailed the LIFE EcoTimberCell project and the tests and developments that are being carried out in it, to achieve structural timber products in all types of buildings with the capacity to reduce the amounts of CO_2 emitted in the production of materials, as well as the storage of carbon in the building itself.

The Councillor and the attendees were able to see how EcoTimberCell works and the tests that are being carried out on it, proving first hand the future potential of timber construction through proximity products obtained through sustainable forest management.

In addition, the director of Pemade, took advantage of the technical visit made by the head of the Ministry of Economy, Employment and Industry of the Xunta de Galicia, the regional department that currently depends Xera, to provide a detailed explanation of the training and R & D & i that develops Pemade in the USC, while transferring to the Councillor Francisco Conde the vocation of this structural wood engineering platform to advance in the transfer of knowledge and technology to the forestry sector and wood-related industries.

Another outstanding aspect of the visit was to discover the technical and scientific possibilities offered by PEMADE's laboratory, going so far as to verify live some of the experiments on structural resistance calculations of wood in which his technical-

scientific team works, in one of the three laboratories accredited in Spain by ENAC to carry out structural wood tests..

Presentation of the EcoTimberCell project to the Construction Industries Commission

[20/02/2019

On April the 1st, ITeC organized a presentation session of the LIFE EcoTimberCell project at its headquarters in Barcelona, **addressed to the Construction Industry Commission (CIC).**

The Construction Industry Commission was created by ITeC in early 2016, with the main objective of discussing the most current issues in the sector and to be a meeting point for industries with technology centers. With the creation of this Commission it is intended that the vision of the industry reach the ITeC's

Advisory Council as a transversal entity that brings together all the agents of the construction sector.

EcoTimberCell project, entitled "Ecological cellular structural systems for a Building model for Climate Change Mitigation and Forest value enhancement", promotes the sustainable construction with local timber and it is formed by the following consortium: the Engineering Platform Structural of Wood (PEMADE) of the Campus Terra of the USC, **Betanzos HB, CETEMAS, 3edata** environmental engineering and the **ITeC**.

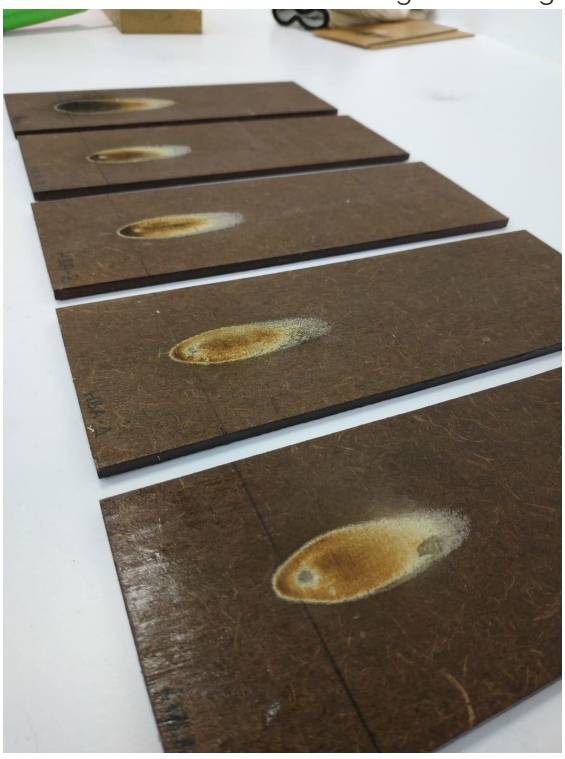
The main objective of the project is to develop local timber building products from sustainable forest management that reduce energy consumption in the construction sector. The creation of EcoTimberCell systems (ETC) and ETC housing modules to project passive single-family homes will make this savings possible.

The LIFE EcoTimberCell project (LIFE17CCM/S/000074) has received funding from the LIFE program of the European Union

For more information: https://www.life-ecotimbercell.eu/en/home

Improving timber in EcoTimberCell: Fire performance [14/05/2019]

Within the LIFE EcoTimberCell project, CETEMAS is studying different fire retardants compatible with timber fibre board, with the aim of improving fire performance in the development of new products. Analyzing the results obtained in the corresponding standard tests, the best fire retardants will be pre-selected within the evaluated group, which covers different natures (varnishes or lasures, intumescents or retardants), which will provide the board with substantial improvements in terms of **reaction to fire classification.**



These studies are being carried out taking into account the **compatibility of the flame-retardant products** (nature of the product and/or mechanism of application) **with the manufacturing process of the high-density fibreboard developed by Betanzos HB**, as well as with its surface characteristics, so that the application is efficient, both in technical, logistical and economic terms. The results will allow to define the best board-spray combination that will be used in the final development of the EcoTimberCell structural elements by PEMADE (USC) and its subsequent certification through **ITEC**, the final objective of the project.

Survey to find out the market potential of a product from the EcoTimberCell project [22/05/2019]

Taking advantage of our presence at Construmat, the International Construction Fair of Barcelona, we have prepared a survey, with the aim of choosing the most information possible to validate the business model of Innovation in Timber of LIFE EcoTimberCell.

We remind you that LIFE EcoTimberCell is a Close to market Pilot Project in which the Pemade of the University of Santiago de Compostela (Campus Terra), ITeC, the Centre of Wood Technology of Asturias, Betanzos HB and 3edata are participating. The objective of this project is to develop constructive products made of local timber from sustainable forest management that reduce energy consumption in the construction sector.

The resulting product of this project wants to be marketed through the creation of a technology-based Spin Off, supported by the University of Santiago de Compostela.

Take the survey

LIFE EcoTimberCell at Construmat 2019 [15/05/2019]

Presentation of the project in Barcelona Building Construmat

LIFE EcoTimbeCell has had an outstanding presence at the **Barcelona Building Construmat**, an international reference event that activates and accompanies the the transition of the building sector towards a

new model of growth and sustainable development. thanks to digitalisation, technological innovation and new building techniques. The only event in the world that allocates 2000 m2 to innovation, new technologies and new materials.

In this edition we had the opportunity to present the LIFE EcoTimberCell project in two communications. In the first of them, María Portela from the Platform of Structural Wood Engineering of the Campus (PEMADE) Terra of the University of Santiago de Compostela presented the project, its partners (PEMADE, Betanzos HB, CETEMAS, ITEC and 3edata), objectives and the work carried out by PEMADE, highlighting the achievement of European funds from the LIFE program that is committed to more sustainable construction with timber.

The second communication was made by Jordi Navarro from the Institute of Construction Technology (ITEC) in which he detailed the participation of this institute in the project on the subject of certification and validation, very important aspects in the final success of the products to be developed by LIFE EcoTimberCell and its university spin-off.

These presentations were complemented by the permanent presence during the whole Construmat at ITEC's stand, with an exhibition of the project on two information panels and with samples of the prototypes manufactured in PEMADE's laboratory with the Betanzos HB boards.

It has been a magnificent experience to connect with the construction sector and present our project in an incomparable setting.

Celebration of the San Isidro Labrador festivity at the University of León [16/05/2019]

For sustainable construction with timber

On May 16, the School of Agricultural and Forestry Engineering held a ceremony to celebrate its patron saint's day, St. Isidro Labrador, in which María Portela, from the Platform of Structural Wood Engineering (PEMADE), gave the main lecture of the academic event.

This conference was about sustainable building in wood, highlighting the LIFE EcoTimberCell project, which is the focal point of the conference.

At the event, aimed at students and teachers from the School of Agricultural and Forestry Engineering, the European Union's LIFE programme was also highlighted as a highly valuable tool for promoting projects of this type aimed at action against climate change.

100 people participated in this very well received conference, as well as the presence of the Junta de Castilla y León through the Director General of Telecommunications, the Provincial Council of León through its Deputy for Youth and Sports, the Mayor of León and the Vice-Chancellor of the Faculty of the University of León.

LIFE EcoTimberCell information panels [20/06/2019]

Look for them at each partner's headquarters!

For those of you who have not been able to see the information panels that we have prepared for the LIFE EcoTimberCell project, you can see them here and soon download them, so that you can quickly find out about the project and the different actions that make it up. These panels are installed in the facilities of the project partners and we have presented them in Barcelona, in the 2019 edition of Construmat.

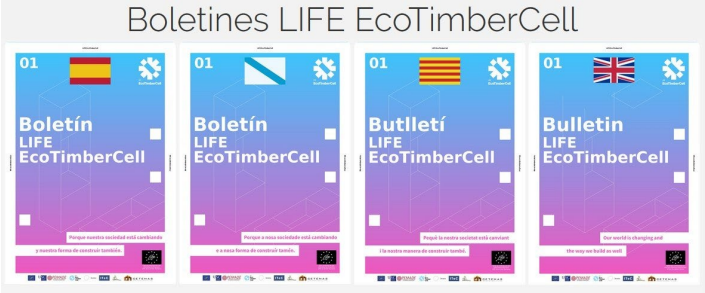
The panels are printed on wooden board (Tablex) of Betanzos HB.

Bulletin 1 LIFE EcoTimberCell avaliable [22/06/2019]

We have published **our first LIFE EcoTimberCell project bulletin**. The first of many in which we will be counting the advances of the project, activities related to it and we will make specific reports about the work carried out.

In this first newsletter you will find an introduction to the LIFE EcoTimberCell project together with the first news associated with the project. In the next one we will tell you about the tests that are taking place to develop the ETC cells.

You can consult them in Spanish, Catalan, Galician and English languages in our web page, in the Documentation section of the web resources.



Visit of the Master in Structures, Building and Timber Design [23/06/2019]

The **Master in Structures, Building and Timber Design of the Basque Country** visited the **Platform for Structural Engineering of Wood (PEMADE)** on 22 June. This master's degree is a postgraduate specialising in the emerging wood sector, created by the **University of the Basque Country** in collaboration with the **Euskadi Wood Association (Baskegur)** and the **Basque Government**, as part of its commitment to the promotion of timber as stated in its strategic plan.
The director of the master together with his students, mostly architects currently working in their profession and also being trained in structural timber, received a presentation of the LIFE EcoTimberCell project, its participants, its objectives and the systems to be developed. They were also able to see the first prototypes and the different tests carried out. An open debate was generated on the possibilities of application of the ETC systems and generated impressions.

The business project based on LIFE EcoTimberCell wins the Explorer Program award in Lugo [25/06/2019]

First finalist and selected to compete in the category Disruptive Technology Explorer Award

Andreina Mitsai y **Daniela Lourenço**, promoters of the **technology-based project** to add value to local timber by offering a comprehensive service of advice and marketing of innovative structural and ecological timber systems, **EcoTimberCell systems**, have been the first finalists of the Explorer Program in Lugo and have also been selected to compete in the **Disruptive Technology Explorer Award** category, promoted by INDRA, eligible for a prize of 3,000 euros and support in the development and advice of the project by IndraVentures professionals.

They will also travel to Silicon Valley, California, along with 55 other people, one for each Explorer Space that the program has throughout Spain, Argentina and Portugal, with visits to leading technology companies such as Google, Facebook, Apple or Airbnb, as well as **masterclasses at universities such as Singularity University or Stanford and contact with investors.**

The **winning project is linked to the LIFE EcoTimberCell project**, a project of the LIFE programme financed by the European Union, with which the EcoTimberCell systems are being developed, through certified local timber from sustainable forest management. We at LIFE EcoTImberCell are delighted with this recognition.

The **Explorer programme** is a national program promoted by Banco Santander through the Centro Internacional Santander Emprendimiento (CISE) and is managed by the USC through the Transfer and Entrepreneurship Valorization Area. The program has two centers: Explorer USC Santiago and Explorer USC Lugo, and also has the local support of the Xunta de Galicia and in the case of Lugo with the County Council of Lugo.


6 Lugo

MIÉRCOLES 7 DE AGOSTO DE 2019 EL PROGRESO

Con un pie en Silicon Valley

▸ Dos alumnas de Ingeniería Civil irán a Google tras ganar un premio del Banco de Santander

▸ El proyecto de Andreína Vargas y Daniela Lourenço propone vigas de madera más ecológicas

SABELA CORBELLE

LUGO. Dos alumnas de Ingeniería Civil, de la Escuela Politécnica Superior de Lugo, visitarán las sedes de Google, Facebook, Apple y Airbnb, en el mítico Silicon Valley estadounidense, tras ganar uno de los premios del proyecto Explorer del Banco de Santander.

La venezolana Andreína Mitsai Vargas Carrión y la portuguesa Daniela Lourenço dos Santos viajarán a California el próximo 31 de octubre para asistir a varias clases magistrales en las Singularity y Stanford University, a la vez que harán 'networking' con trabajadores de estas empresas punteras en internet, inversores y el resto de los 53 estudiantes y emprendedores de España, Argentina y Portugal que, como ellas, fueron seleccionados por el Centro Internacional Santander Emprendimiento (Cise), en la convocatoria del proyecto Explorer. Allí, Andreína y Daniela pretenden —como ellas dicen— «empapar lo máximo posible» de estos emprendedores que encabezan empresas punteras en internet.

Ya de vuelta a España, la expedición que viajará a Silicon Valley está citada en la Ciudad Grupo Santander, en Boadilla del Monte, donde un jurado integrado por representantes del Banco Santander, el Cise y entidades colaboradoras seleccionará los ganadores del Explorer 2019. Los tres mejores emprendedores recibirán una dotación económica de 30.000, 20.000 y 10.000 euros, respectivamente, para que puedan acelerar sus respectivos proyectos.

Andreína y Daniela fueron las impulsoras de Timbersoul Innovations, una 'spin off' que comercializará vigas de madera basadas en el proyecto Life Eco Timber Cell. Estas vigas —más ligeras que las habituales— están hechas con pino, castaño y eucalipto, dos tableros de fibras de alta densidad con restos de madera de eucalipto y dos listones de madera serrada.

VENTAJAS. Este material aporta varias ventajas frente a las vigas tradicionales como el uso de maderas locales y la apuesta por una construcción más ecológica con el uso de madera en lugar de otros más contaminantes como el hormigón y el acero. «Estas vigas son también más resistentes que las tradicionales y, en su construcción, se reduce la cantidad de madera en un 85 por ciento. Al igual que también disminuyen los residuos y generan menos emisiones de dióxido de carbono a la atmósfera dado que la madera procede de plantaciones forestales sostenibles», afirma Daniela Lourenço, quien añade que las vigas también tienen la particularidad de «imitar el comportamiento biomecánico de los árboles».

Aunque tan solo es un proyecto, las promotoras pretenden ponerlo en marcha como empresa en octubre de 2020, encargando la fabricación de este material a subcontratas y con una planificación de ventas en el resto de España y el norte de Portugal en 2021 y su extensión por Europa durante el año siguiente. Además de las vigas, Timbersoul propone trasladar este mismo tipo de material a otros elementos constructivos como muros, cerramientos, forjados y cubiertas.

ESCAPO DE VENEZUELA. Andreína Vargas salió de Venezuela hace cinco años —debido a la situación política de su país— rumbo a España con el objetivo de estudiar Ingeniería Civil en el campus de Lugo. Según dice ahora, a toro pasado, el paso «fue difícil pero cosas como estas hicieron que valga la pena el esfuerzo».

Esta joven venezolana acaba de graduarse en Ingeniería Civil y tenía una beca de colaboración para la investigación en el departamento de Hidráulica de la Escuela Politécnica Superior de Lugo. Allí trabajaba con modelos numéricos de alta resolución para simular la hidrodinámica de las rías gallegas.

A su compañera, Daniela Lourenço, aún le quedan flecos para graduarse. Daniela trabajaba en la plataforma Pemade, de Ingeniería de Madera Estructural, cuando Manuel Guaita, catedrático de la Politécnica, les planteó el proyecto Explorer. «Decidimos presentarnos y comenzamos a participar, en febrero, en el proyecto europeo Life EcoTimber Cell pero no teníamos ninguna esperanza de ganar. Había proyectos muy buenos, basados en tesis, con los que competíamos. Fue toda una sorpresa», dice Daniela.

Daniela Lourenço y Andreína Vargas.

Daniela Lourenço
Trabajaba en Pemade

«No teníamos ninguna esperanza de ganar. Había proyectos muy buenos, basados en tesis. Fue toda una sorpresa»

Andreína Vargas
Era becaria en Hidráulica

«El paso de salir de Venezuela y venirse a Lugo a estudiar fue difícil, pero cosas como estas hicieron que valga la pena»

Otro galardón Indra también las reconoce

Andreína y Daniela también resultaron finalistas, con este mismo proyecto, para competir en la fase nacional en la categoría Disruptive Technology Explorer Award. Esta modalidad, impulsada por la empresa Indra, ofrece la posibilidad de optar a 3.000 euros para el desarrollo del proyecto y el asesoramiento por parte de los profesionales de Indraventures.

Sondeiquí

El programa Explorer incluye otra categoría, la Woman Explorer Award, en la que resultó ganadora otra estudiante del campus, Laura López Lorenzo, con su proyecto Sondeiquí. Este galardón, dotado con 20.000 euros a nivel nacional, está patrocinado por la Fundación EY se fallará en noviembre.

Sondeiquí es una iniciativa empresarial orientada a proporcionar a los paladares más exquisitos los mejores sabores de cada país productores y comercializados en Galicia de forma artesanal, ecológica y respetando el medio ambiente. Entre sus productos estrella, está el huitlacoche gallego, un hongo que crece en los granos de maíz y que en México, de donde es originario, está considerado un manjar en la alta cocina.

Radis Ibérica

También resultó finalista, en el campus de Lugo, Radis Ibérica, una empresa de innovación tecnológica especializada en la medición, emisión de informes y minimización de gas radón con una app móvil promovida por Aitor Regoy Ana Losada.

El Progreso newspaper reports on the success of the future LIFE EcoTimberCell spin-off
[7/08/2019]
"With one foot in Silicon Valley"

Today has been published in the **newspaper El Progreso an article focused on the success of Andreina Mitsai and Daniela Lourenço, promoters of the technology-based project to put in value local timber** offering a comprehensive service of advice and marketing of innovative structural systems and ecological timber, EcoTimberCell systems.

As we had told you, in June the business project based on LIFE EcoTimberCell was awarded in the Explorer program, a national entrepreneurship program to help land projects by promoting their launch to the market. A programme that offers support, training, advice and a trip to Silicon Valley for young people who are committed to transforming the future

with innovative ideas, such as those of **LIFE EcoTimberCell** from the European Union's LIFE programme.

Here is the article.

Presentations of LIGNOMAD 19 [19/08/2019]

Videos and Articles of presentations made by LIFE EcoTimberCell

The organization of LIGNOMAD 19 has recorded and made available to the public all the papers that took place during the Congress on construction with timber and other lignocellulosic materials held in Santiago de Compostela from July 1 to 3.

It is a very good opportunity to see all the materials presented at the Congress by experts in timber building and to see the papers associated with **LIFE EcoTimberCell**.

The access to all the presentations can be found in the Youtube channel **of the Forest Industry Agency of Galicia-Xera:**

- **Youtube channel-Xera**

You can consult the programme here to identify the papers that interest you most in the different sessions of the LIGNOMAD Congress 19 : Programme

We leave here the link to our papers:

LIFE EcoTimberCell Project: new construction systems and their certification. [Manuel Guaita / Jordi Navarro]
https://youtu.be/cMrGRAQf1Qs

Evaluation of physical properties and reaction to fire of high density fibreboards under different fireproofing treatments. LIFE EcoTimberCell Project [Abel Vega]

https://youtu.be/5J5U2rJGHsc?t=8073

In addition, the book of conferences of LIGNOMAD 19 has been published, which can be accessed from this **link**

- Access to the conference paper **LIFE EcoTimberCell Project: new construction systems and their certification**
- Access to the conference paper **Evaluation of physical properties and reaction to fire of high density fibreboards under different fireproofing treatments. LIFE EcoTimberCell Project**

Creación de redes con LIFE Lugo+Biodinámico y LIFE RenaturalNZEB [18/09/2019]

This week, the meeting between LIFE projects on Climate Change was organised by the Lugo+Biodynamic LIFE project, coordinated by the City Council of Lugo, which invited the LIFE EcoTimberCell and LIFE RenaturalNZEB projects to a conference in which more details of their projects were presented and synergies between such related projects could be established.

The members of all the projects presented their actions and developments, as well as the results obtained so far in the projects were visited in different areas of Lugo. One of these visits included the PEMADE facilities of the University of Santiago de Compostela, where the EcoTimberCell systems were shown and the laboratory where these systems are tested and validated.

LIFE Lugo+ Biodinámico is a project of the EU LIFE programme whose overall objective is to implement in the city of Lugo an innovative strategy of urban planning to achieve resilient urban fabrics adapted to the consequences and effects of Climate Change and to improve the life of terrestrial ecosystems, in accordance with the objectives of Sustainable Development, highlighting, among others, the improvement and creation of green and blue infrastructure in the city of Lugo, completing the green belt of the city in its northern area, also the strategic planning of a new sustainable urban development as a demonstrative example of resilience of cities against climate change that enhances the natural values of the municipality and its environment without forgetting to raise awareness, putting in value the importance of the municipality's ecosystems.

LIFE Renatural NZEB is a LIFE Environment project led by the Regional Government of Extremadura whose main objective is to develop Nearly Zero Energy Consumption Buildings with a low carbon footprint, using natural and recycled products.

LIFE EcoTimberCell is a LIFE climate change mitigation project led by the Platform for Structural Wood Engineering of the University of Santiago de Compostela, which aims to reduce greenhouse gas emissions through an innovative timber building solution.

The meeting was of great interest to all the projects, opening up possibilities for joint work and dissemination of results.

Workshop on forestry biomass [13/09/2019]

Betanzos HB presented at the workshop on forest biomass as a source of improved-sustainability bioproducts, the innovation projects that has developed and the results achieved, among which was the LIFE EcoTimberCell as a model of sustainable building from local timber.

The workshop on the use of forest biomass as a source of sustainable bioproducts, organized by REGALIs (Galician Network of Ionic Liquids), consisted of different presentations, debates and discussions on the most cutting-edge research in the world in this field, available technologies, as well as the applications that are being developed, such as textiles or the lines of work in progress of leading Galician companies.

La Voz de Galicia newspaper publishes an interview about LIFE EcoTimberCell and its future spin-off [22/09/2019]


La Voz de Galicia

LUGO

Timbersoul o cómo frenar el cambio climático a través de la edificación

La «spin off» radicada en Lugo comercializará y asesorará sobre las vigas aligeradas. Ahorran un 85 % de material manteniendo prestaciones y son ecológicas

ALBERTO LÓPEZ

We bring you the interview made by the newspaper La Voz de Galicia to Daniela Lourenço and Andreina Mitsai, with the Timbersoul project **presented to the Explorer Program of the LIFE EcoTimberCell project**.

The interview reviews the project and its **innovative timber systems, the EcoTimberCell systems** and how they intend to promote sustainable construction with locally produced timber, to reduce the effects of Climate Change in the building sector with sustainably managed forest resources.

You can see the interview in the following link :
https://www.lavozdegalicia.es/noticia/lugo/lugo/2019/09/22/timbersoul-frenar-cambio-climatico-traves...

LIFE EcoTimberCell at the Conference organised by LIFE My Building is Green in Badajoz [14/11/2019]

C On the occasion of the Conference organized by the project L**IFE My Building is Green, Natural Solutions for the Adaptation of Buildings to Climate Change**, LIFE EcoTimberCell was invited to present its project. In addition to presenting the project, it brought materials such as the EcoTimberCell cell and descriptive panels of the project so that attendees could see firsthand the solutions provided by LIFE EcoTimberCell for action against Climate Change. This conference was organised by the Badajoz Provincial Council and the other partners of the LIFE My Building is Green project.

LIFE My Building is Green is a LIFE Project that aims to increase the climate resilience of education and social care buildings through the implementation of Nature Based Solutions (NBS) as prototypes of climate adaptation and improved property welfare. This LIFE project was born at the same time as LIFE EcoTimberCell, being presented in the same edition of the Kick Off Meeting as LIFE EcoTimberCell, since both projects were linked, given the shared theme between the two projects. The members of this project are the County Council of Badajoz, the Municipal Chamber of Porto, the Central Alentejo Intermunicipal Community (CIMAC), the Cartif Foundation, and the Higher Council of Scientific Research (CSIC).

From this relationship, **LIFE EcoTibmerCell** was presented in Badajoz at the specific conferences to learn about the impact and functionality of NBS as tools for local

adaptation to climate change in buildings and cities. The Conference included specialised presentations on the impact of climate change on buildings, general adaptation strategies and specific and innovative NBS technology. The aim was to raise awareness of how NBS is a local adaptation measure to climate change in buildings.

In addition, this day was used to network with the project LIFE My Building is Green, to enhance the results to be obtained between LIFE projects.

LIFE EcoTImberCell at the Luis Asorey series of conferences [20/11/2019]

On 19 November, **LIFE EcoTimberCell** was at the County Council of Lugo, at the **Luis Asorey Series of Conferences**, through the presentation of Manuel Guaita (Director of the Platform for Structural Wood Engineering - PEMADE - of the Campus Terra of Lugo)..

The Luis Asorey Conference Series is a conference held annually in the County Council of Lugo on relevant environmental topics. This year it was dedicated to **Bioeconomy and Circular Economy**, central themes of the LFE EcoTimberCell project. It is organised by the **Royal Galician Academy of Sciences**, sponsored by the **County Council of Lugo** and collaborates with the **University of Santiago de Compostela through the Campus Terra**.

The conferences were hosted by the **Environment Deputy** José Luis Raposo, the **Mayor of Lugo**, Lara Méndez; el **President of the Royal Galician Academy of Sciences** José Manuel Lema and the **Coordination Vice-rector of the Campus Terra of Lugo.**

Manuel Guaita's intervention focused on Bioeconomy and timber building, in which he explained the LIFE EcoTimberCell project, the LIFE programme of the European Union, the objectives of the project and its members. As well as deepened in the tasks developed by PEMADE, in the advance of EcoTimberCell cells, in its application in the context of circular economy and in the use of natural resources of proximity.

IdeaLugo awards the innovative TimberSoul project born from LIFE EcoTimberCell [30/11/2019]

The fifth edition of the IdeaLugo Awards, organised by the University of Santiago de Compostela, Abanca and the El Progreso group, has selected the TimberSoul project for its commitment to incorporate innovation into the traditional forestry sector.

TimberSoul is the business initiative arising from the **Life EcoTimberCell** project, coordinated by PEMADE.

The IdaeLugo Awards are addressed to graduates of the Lugo Campus who present an innovative business project in the early or acceleration phase.

In addition to TimberSoul, awarded with the Accésit, IdeaLugo also awarded the Bewell initiative for animal welfare.

Timbersoul was awarded the runner-up prize, which has an economic prize of 1,000 €. The prize also includes tutoring on the viability of the company, financial advice, personalised offer on special conditions of financial products and services, by Abanca, and free accommodation for three months in the business incubator of the CEL-Iniciativas Foundation in Lugo.

Daniela Lourenço and Andreina Vargas presented the Timbersoul project, a future

spin-off of USC, which was also recently recognised by Banco Santander's Explorer programme. The good work of the LIFE EcoTimberCell project and these entrepreneurs has been reflected through tis awards.

LIFE EcoTimberCell awarded at the XVII USC Business Ideas Competition [29/11/2019]

Award obtained by TimberSoul in the category Research Results

The Timbersoul project, generated in the context of LIFE EcoTimberCell has been awarded in the **XVII edition of the Innovative Business Ideas Competition of the USC** in the category of Research Results.

These awards aim to reward entrepreneurs with innovative ideas that can be turned into business projects in the short and medium term. The competition, promoted by the USC in collaboration with the Xunta de Galicia, is aimed at the entire university community and all areas of knowledge. Five prizes are awarded, each of which has an economic value of 500 euros.

The number of ideas submitted to this edition was 103, a fairly large number for this type of call. The jury valued the innovative character, the degree of maturity of the idea, the market

and the presence of equality policies.

This is the third time that Timbersoul, an initiative that emerged from the LIFE EcoTimberCell project, has been awarded a prize.

II Building Workshop 2030 [30/11/2019]

Ferran Bermejo, Technical Director of ITeC, participated in the 2nd Construction 2030 Workshop within the Cajasiete Chair of Social and Cooperative Economy of the University of La Laguna, with the aim of explaining the actions being developed by ITeC to meet the objectives of the foundation and its relationship with the Sustainable Development Goals and the current need for digitisation in the building sector. He emphasized the tools being developed by the ITeC and the main European innovation projects in which it currently participates, including **LIFE EcoTimberCell.**

This conference, held on 29 November, is made up of a panel discussion on socio-environmentally responsible construction with agents in the building sector. As they indicate, it is a day of work and exchange of ideas that arises as a result of an investigation that has been carried out recently. One of the conclusions of this research, carried out thanks to the collaboration of companies from the province of Santa Cruz de Tenerife, is that sustainability is a key aspect for the construction sector. It is essential to take advantage of the fact that this is perfectly integrated into the objectives of CSR..

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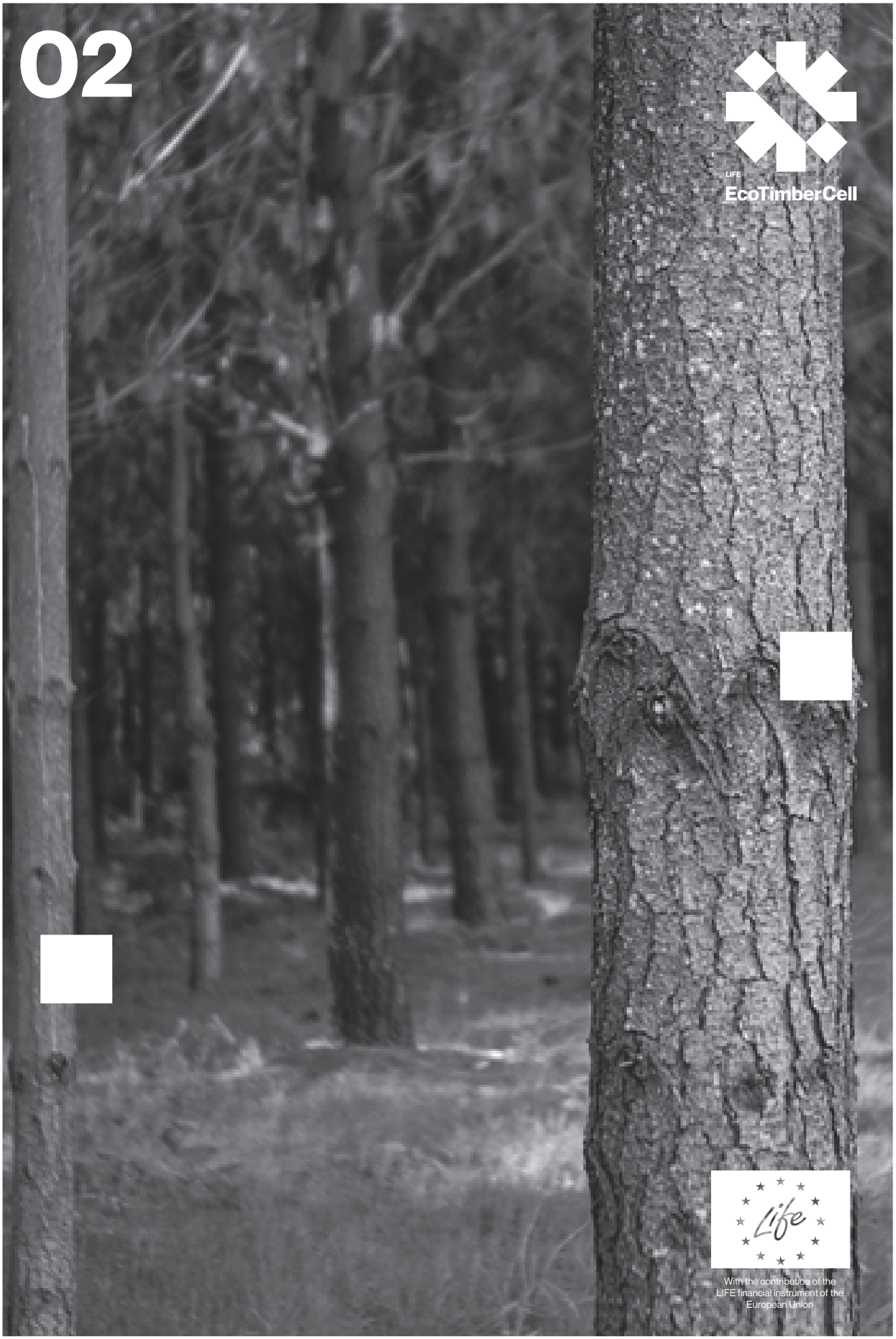

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