

# State of the art of hardwood production in Europe and Spain and the challenges for a hardwoods-based sector in Galicia (NW ES)

Vanesa Baño<sup>1</sup>, Uwe Kies<sup>1</sup>, Mercedes Rois<sup>2</sup>, Francisco Pedras<sup>2</sup>, Fernando Sanz<sup>2</sup>, and Anne Toppinen<sup>3</sup>

<sup>1</sup>InnovaWood



<sup>2</sup>XERA



<sup>3</sup>University of Helsinki



Funded by  
the European Union



InnovaWood

The European Network  
for **Wood** Research,  
Innovation and Education

# 1. Introduction



# EU policies affecting wood consumption

- **European Green Deal (2019)**
- New European Bauhaus (2020)
- Renovation wave (2020)
- Circular Economy Action Plan (2020)
- Carbon Removals Certification Regulation (CRC, 2022)
- EU Taxonomy Environmental Delegated Act (Taxonomy, 2023)
- Energy Performance of Buildings Directive (EPBD 2018/2023)
- Construction Products Regulation (CPR revision, 2024)
- Directive on packaging and packaging waste (DPW, 2018)



## European Commission

**The first climate-  
neutral continent**  
by 2050

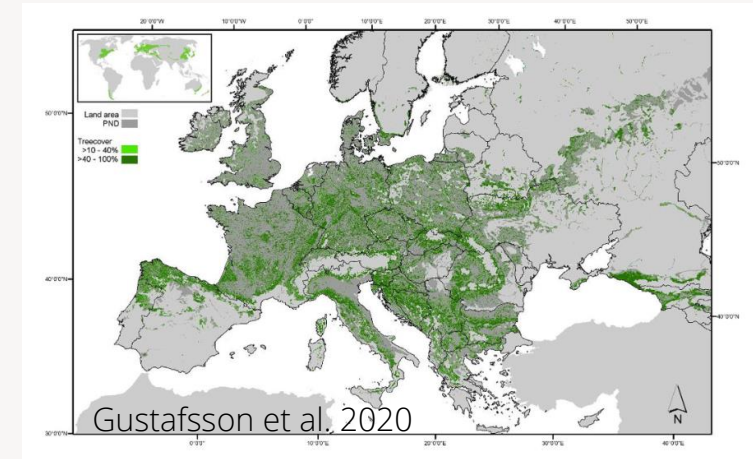
**At least 55% less**  
net greenhouse gas emissions by  
2030, compared to 1990 levels

**3 billion**  
additional trees to be planted in the  
EU by 2030





# Growing stock in wood supply in European forests



The **growing stock of broadleaved species (1.6%/year)** increased at a higher rate than that of coniferous species (1.2%/year) (*Forest Europe, 2021*).

The prevalence of **spruce** (*Picea abies*) in European forests, representing approximately **20% of the biomass stock** (*Schelhaas et al., 2018*), is being affected by beetle attacks because of the climate change.

The European forests' hardwood growing stock represents an opportunity to address diversification in wood species for industrial use.

## 2. Objective

- European hardwood **production** and their main **markets**
- The role of hardwoods in the **construction sector** in Spain
- The **challenges of Galicia**, a typical hardwoods forest region in **Northwestern Spain**, in adding value to underutilised and heterogenous native hardwood resources





### 3. Methodology







# Methodology

## 1. Hardwood production and markets:

- **EU-27:** FAOSTAT statistical database (FAO, 2023)
- **Spain:** Ministry for Ecological Transition and the Demographic Challenge database (MITECO, 2023, 2024)
- **Galicia:** reports of timber-forest value chain of XERA (Picos 2018, 2022, 2023)

## 2. Hardwood products in Spain and Galicia for timber construction:

- **CEN:** Identification of wood properties and wood products in EN standards
- **EOTA:** Identification of innovative products on the market with ETA certification in the European Organisation of Technical Assessment database

## 3. Analysis of the resilience of the Galician forests for current markets:

- **Workshop** in Lugo with stakeholders of the forestry production, the sawnwood industry and panels and pulp industries.
- Three main **questions** to answer:
  - 1) what are the main resilience challenges in the region?
  - 2) How can these challenges be overcome?
  - 3) Which solutions do we need and from whom?



A large pile of cut logs, likely from hardwood trees, is shown. The logs are stacked, and their ends are visible, showing the growth rings. Some logs have blue and green markings (possibly paint or chalk) on their ends, including numbers like '2' and '1'. The background shows some green moss and bare trees, suggesting a forest setting.

## 4. Results

4.1. Quantitative overview of the hardwood removals and the main markets in Europe, Spain and Galicia

4.2. Hardwood products for wood construction in Spain

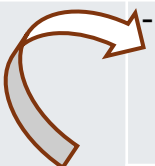
4.3. Main challenges in Galicia for the forest management and the wood industry





# Hardwood removals and production in 2022 (MMm³)

Domestic removals	Domestic removals by industrial use in 2022		Products
<b>ROUNDWOOD:</b> EU-27: 165 (32% of total) ES: 8.54 (47% of total) GZ <sup>1</sup> : 6.5 (50% of total)	<b>WOODFUEL:</b> EU-27: 87.9 (67% of total); ES: 1.34 (36% of total)		
	<b>INDUSTRIAL ROUNDWOOD:</b> EU-27: 76.7 (20% of total) ES: 7.19 (50% of total)	<b>SAWLOGS &amp; VENEER LOGS</b> EU-27: 28.6 ES: 0.73	<b>-SAWNWOOD PRODUCTION<sup>3</sup>:</b> EU-27: 8.58 ES: 0.62
		<b>PULPWOOD, round and split</b> EU-27: 45.3 ES: 6.06	<b>- VENEER SHEETS<sup>2,3</sup></b>
			<b>- WOOD-BASED PANELS<sup>2,3</sup></b> (fibreboard, particleboard, OSB, plywood)
			<b>- PULP<sup>2,3</sup></b>
		<b>OTHER INDUSTRIAL ROUNDWOOD</b> EU-27: 2.85 ES: 0.14	

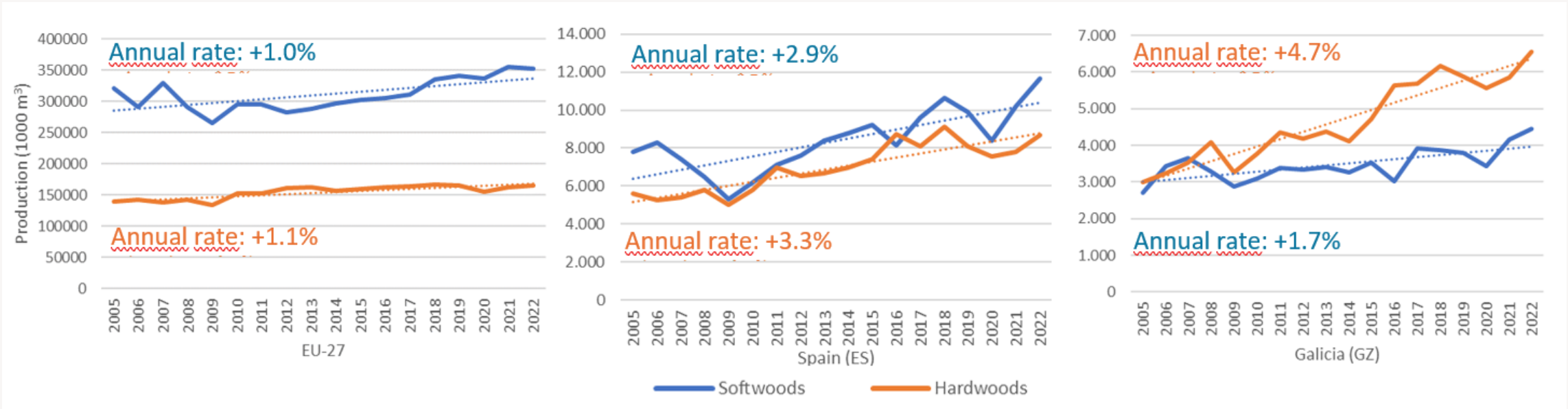


**Conversion ratio  $\cong$  0.3**  
m³ sawnwood/m³ logs

<sup>1</sup> GZ: Galicia (Picos, 2023); <sup>2</sup> Not differentiated between softwoods and hardwoods in FAO database; <sup>3</sup> No data from MITECO  
NOTE: The total includes softwood + hardwood removals or production



## Dynamics in hardwoods vs. softwood roundwood removals



Dynamics and annual rates (%) of roundwood removals in  
EU-27 (from FAO database), Spain and Galicia (from MITECO database)

### Hardwood removals by species in Spain in 2021

(MITECO, 2024):

*Eucalyptus spp.* (6.8 MMm<sup>3</sup>)

*Populus sps.* (0.5 MMm<sup>3</sup>)

*Quercus robur* (0.14 MMm<sup>3</sup>)

*Fagus sylvatica* (0.13 MMm<sup>3</sup>)

*Castanea sativa* (0.10 MMm<sup>3</sup>)

*Quercus rubra* (0.05 MMm<sup>3</sup>) others (0.12 MMm<sup>3</sup>)

**Markets:** furniture, interiors, flooring

### Hardwood removals by species in Galicia (XERA 2022):

*Eucalyptus spp.* (5.6 MMm<sup>3</sup>)

Broadleaves (0.2 MMm<sup>3</sup>)

other hardwoods (0.02 MMm<sup>3</sup>)

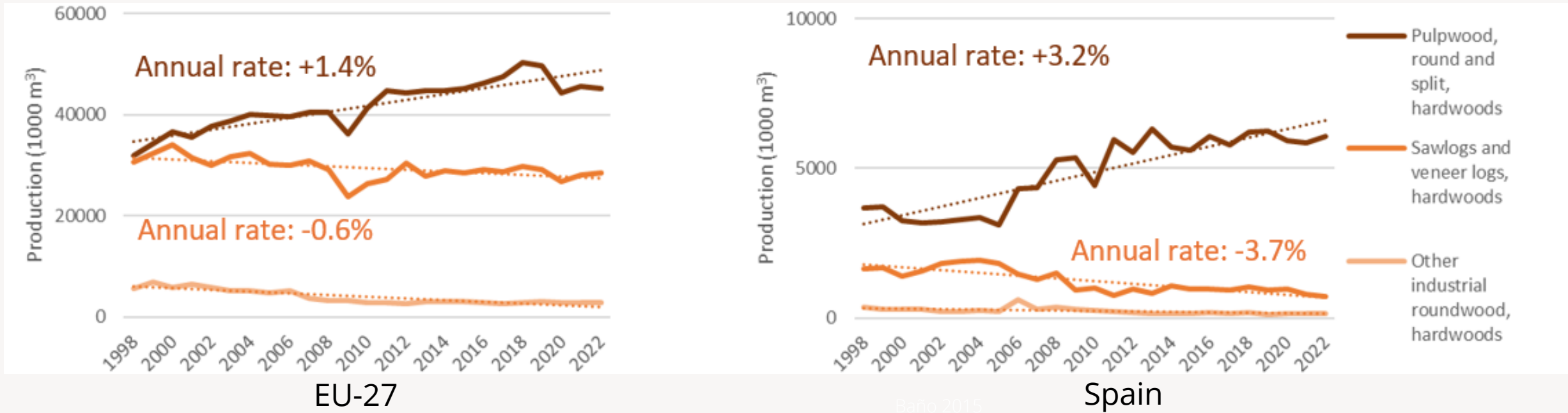
**Markets:** (Rodriguez-Soalleiro, 2024)

**Eucalyptus:** pulp, fibreboard, mussel farms, and carpentry

**Other hardwoods:** firewood, construction sector, railway sleepers, barrels and furniture



## Dynamics in hardwoods vs. softwood INDUSTRIAL ROUNDWOOD removals



Dynamics in industrial roundwood removals by destiny in EU-27 (left) and Spain (right), both developed from FAO database

Note: **pulpwood** included logs destined to **pulp** and **wood-based panels** production



## 4. Results

4.1. Quantitative overview of the hardwood removals and the main markets in Europe, Spain and Galicia

**4.2. Hardwood products for wood construction in Spain**

4.3. Main challenges in Galicia for the forest management and the wood industry



# Mature hardwood products for wood construction regulated by CEN\*

TC	Product	EN standard	Species	Strenth classes	Origin	
					ES	GZ
TC 124. Structural timber	Structurally graded cross-section <b>sawnwood</b>	<b>Visually graded</b> species UNE 56546 EN 1912	<i>Eucalyptus globulus</i> <sup>1</sup>	D40	✗	✓
			<i>Eucalyptus nitens</i>	C35, T24	✗	✓
			<i>Castanea sativa</i>	D27	✓	✓
		<b>Machine graded</b> specie EN 14081-2	<i>Eucalyptus globulus</i> <sup>2</sup>	ET42/ET34/ET28 ET42/ET34/ET24 ET42/ET30; ET42/ET24 ET38/ET28; ET38/ET24 ET34	✗	✓
			<i>Fagus sylvatica</i> <sup>3</sup>	D50/D35/D24 D50/D30; D50/D27 D40/D27; D40/D24 D35/D24; D30	✓	✗
TC 112. Wood-based panels	<b>OSB</b>	EN 300	S/H <sup>4</sup> (poplar, ...)		✓	✗
	<b>Fibreboards</b>	EN 622	S/H <sup>4</sup> (eucalyptus spp...)		✓	✓
	Hardwoods <b>plywood</b>	EN 365-2	poplar,eucalyptus,oak...		✓	✗
	Solid wood panels (SWP) for structural design	EN 12369-3	S/H <sup>4</sup>		✗	✗
	SWP of <b>hardwoods</b> for <b>appearance use</b>	EN 13017-2	chestnut,oak, beech,...		✓	✓
	Cement-bonded particleboards	EN 1328	S/H <sup>4</sup>		✗	✗
	<b>LVL</b>	EN 14279	S/H <sup>4</sup> (eucalyptus spp., ...)		✓	✗

<sup>1</sup>Wood from GZ and Portugal <sup>2</sup>(Moltini G. et al., 2021), (Martin Bacher, 2022); <sup>3</sup>(Moltini et al., 2024);  
<sup>4</sup> S&H: EN standard applies to both softwoods and hardwoods. Some examples are included between brackets  
**\*CEN: European Standardisation Committee**





# Innovative hardwood products on the market for wood construction (EOTA\*)

PA	Product	Trade name/species
PA 13. Timber structures	Glued laminated timber made from solid hardwood (hardwoods glulam)	<b>SIEROLAM</b> ( <i>Castanea sativa</i> )
		<b>VIGAM</b> ( <i>Quercus robur</i> )
	Laminated Strand Lumber (LSL)	<b>LIGNUMSTRAND</b> (Poplar)
	Composite wood-based beams and columns	<b>ECOTIMBERCELL</b> <sup>1</sup> (Eucalyptus hardboard)
PA 14. Wood-based panels	Pre-fabricated wood-based loadbearing stressed skin panels	<b>ECOTIMBERCELL BOX</b> <sup>1</sup> (Eucalyptus hardboard)
PA 21 . Wall & ceiling finished	Fibreboards for non-structural indoor uses made of recycled cellulosic fibres from industrial cellulosic residues	<b>HONEXT BOARD</b> <sup>2</sup>
	Self-Supporting composite lightweight panels	<b>CALIPLAC</b> <sup>1</sup> , <b>THERMOCHIP</b> <sup>1</sup> , <b>TEZNO</b> <sup>1</sup>

<sup>1</sup> Some elements can be made from hardwoods; <sup>2</sup>can be made from both softwoods and hardwoods;  
PA 13. Structural timber products; PA 14. Wood based panels; PA 21. Wall and ceiling finishes and internal partitions  
\*EOTA: European Organisation of Technical Assessment





## 4. Results

- 4.1. Quantitative overview of the hardwood removals and the main markets in Europe, Spain and Galicia
- 4.2. Hardwood products for wood construction in Spain
- 4.3. Main challenges in Galicia for the forest management and the wood industry

Workshop during the international symposium 'Native hardwoods: the resilience of the forest sector?'  
hosted by Galician Agency for Forest-based Industry · XERA · Xunta de Galicia in Lugo, Spain on Feb 28 to March 1, 2024



# Main challenges in Galicia for the forest management and the wood industry

	Main challenges	Proposed measures
Forest management	<ul style="list-style-type: none"><li>1) <b>fragmented, abandoned forest properties</b></li><li>2) <b>low profitability</b> of native hardwoods timber harvesting</li><li>3) need to adapt forest stands to <b>climate change</b></li><li>4) socio-economic model to finance adaptation measures and to share costs and benefits</li></ul>	<ul style="list-style-type: none"><li>1) <b>grouping/association of forest management</b> units &amp; use rights</li><li>2) motivation and incentivisation of landowners for management (taxes)</li><li>3) active management of existing native hardwoods areas, both for conservation and for production, and establish <b>new hardwoods areas</b></li><li>4) landscape level management in forestry and agroforestry to address risk, disturbances and adaptation</li></ul>
Solid wood and EWP	<ul style="list-style-type: none"><li>1) development of <b>higher added-value products</b></li><li>2) ensure the <b>fair benefit distribution</b></li><li>3) <b>small diameter and curved logs</b> in native hardwoods</li></ul>	<ul style="list-style-type: none"><li>1) implementation of comprehensive strategies addressing social and technical dimensions of forest management</li><li>2) <b>update legislation facilitating the hardwoods harvesting</b></li><li>3) <b>education and skills in wood construction</b></li></ul>
Panels, biorefineries, other	<ul style="list-style-type: none"><li>1) <b>small size of forest plots</b></li><li>2) <b>existing biorefineries lack experience</b> in working with native hardwoods</li><li>3) <b>lack of stable hardwoods mobilization</b></li><li>4) difficulty to move from pilot tests to market</li></ul>	<ul style="list-style-type: none"><li>1) <b>public-private cooperation</b></li><li>2) <b>innovative public procurement</b></li><li>3) forest management aligned with forest industry</li><li>4) <b>communication with other sectors related to bioproducts</b></li></ul>





## 5. Conclusions



# Conclusions

- The growing stock of broadleaved forests in Europe increased at a higher rate than coniferous forests, but the industrial uses of hardwoods only represent 20% of the total industrial roundwood
- Most of hardwood removals in EU-27 (53%) are used directly for wood energy purposes.
- In Spain, hardwoods account for 47% of national removals, mostly *Eucalyptus spp.* from Galicia for the pulp industry.
- Although the use of hardwoods in the construction sector is still limited, there is a growing interest on the part of companies and public agents in incorporate them to construction projects in Spain. Sweet chestnut, eucalyptus (both *E. globulus* and *E. nitens*), and beech have been visually or machine graded for structural purposes and included in the European standards. Several Spanish EWP based on hardwoods are already marketed in Europe.
- Fragmented and abandoned forest properties, negligence of management of hardwood forests, administrative limitations on hardwoods harvesting, and lack of established industries for added-value products are the main challenges identified in Galicia.
- Creation of new native hardwoods plantation areas, integrating agroforestry and forest management, and fostering public-private cooperation between different actors in the whole value chain are amongst the promising solutions identified to overcome these challenges.



# Thanks for your attention!

Vanessa Baño<sup>1</sup>, Uwe Kies<sup>1</sup>, Mercedes Rois<sup>2</sup>, Francisco Pedras<sup>2</sup>, Fernando Sanz<sup>2</sup>, and Anne Toppinen<sup>3</sup>

vanesa.bano@innovawood.eu

<sup>1</sup>InnovaWood



<sup>2</sup>XERA



<sup>3</sup>University of Helsinki



Funded by  
the European Union