



Life COMP Olive

New generation of bioCOMPosites
based on OLIVE fibers for industrial application

The LIFE COMPOLIVE project has received funding from the LIFE programme of the European Union



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Biocomposites based on olive pruning fibers for automotive and furniture industrial end-users and the creation of a biomass value chain
LIFE-COMPOLIVE Project

End-users' challenges in the local value chain: Further building on the insights
ScaleUp. Efficient Regional Biomass Logistics and Infrastructure

September 26th, 2023



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1. GENERAL PRESENTATION OF LIFE-COMPOLIVE PROJECT

2. MARKET OPPORTUNITIES

NEW GENERATION OF BIOCOMPOSITES BASED ON OLIVE FIBERS FOR INDUSTRIAL APPLICATIONS

Valorization of olive tree pruning waste → Biocomposites for automotive and furniture.

Benefits:

1. To avoid burning waste in the field
2. To substitute fossil-based raw materials

🕒 2019-23



💰 ~ 1.7 M€ (55%-funded)

Ref.: LIFE18 ENV/ES/000309



Olive grove



Olive tree pruning waste



Biocomposite

Biocomposite

Natural fiber (reinforcement) + Polymer matrix.
Other natural fibers are: linen, jute...

LIFE-COMPOLIVE Project:



Natural fiber:
Olive tree pruning fiber

+



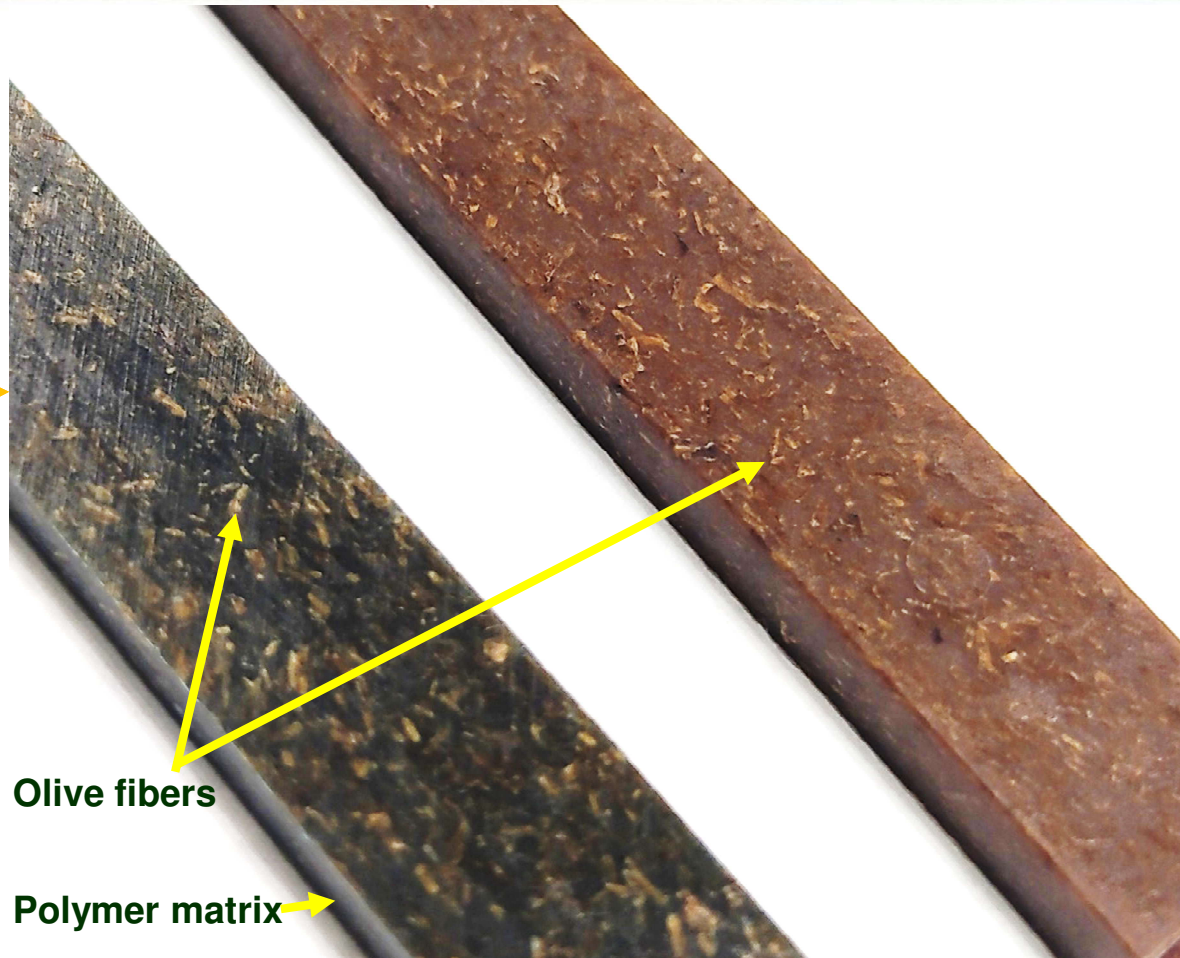
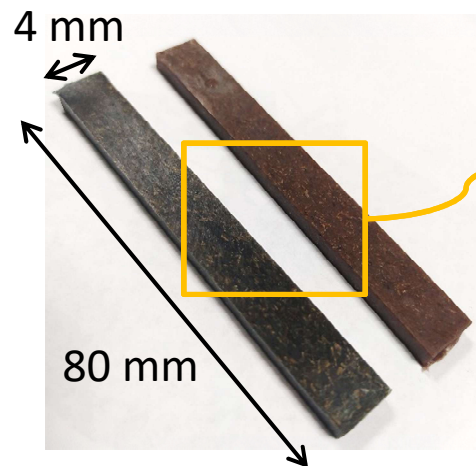
Polymer matrix:
Recycled polypropylene,
Polylactic acid...

→



Biocomposite

Biocomposite COMPOLIVE



Olive fibers

Polymer matrix

Project Consortium

Leader:

andaltec

CENTRO TECNOLÓGICO
DEL PLÁSTICO

Partners:



Plasturgia

caliplast
OUVRONS NOS HORIZONS

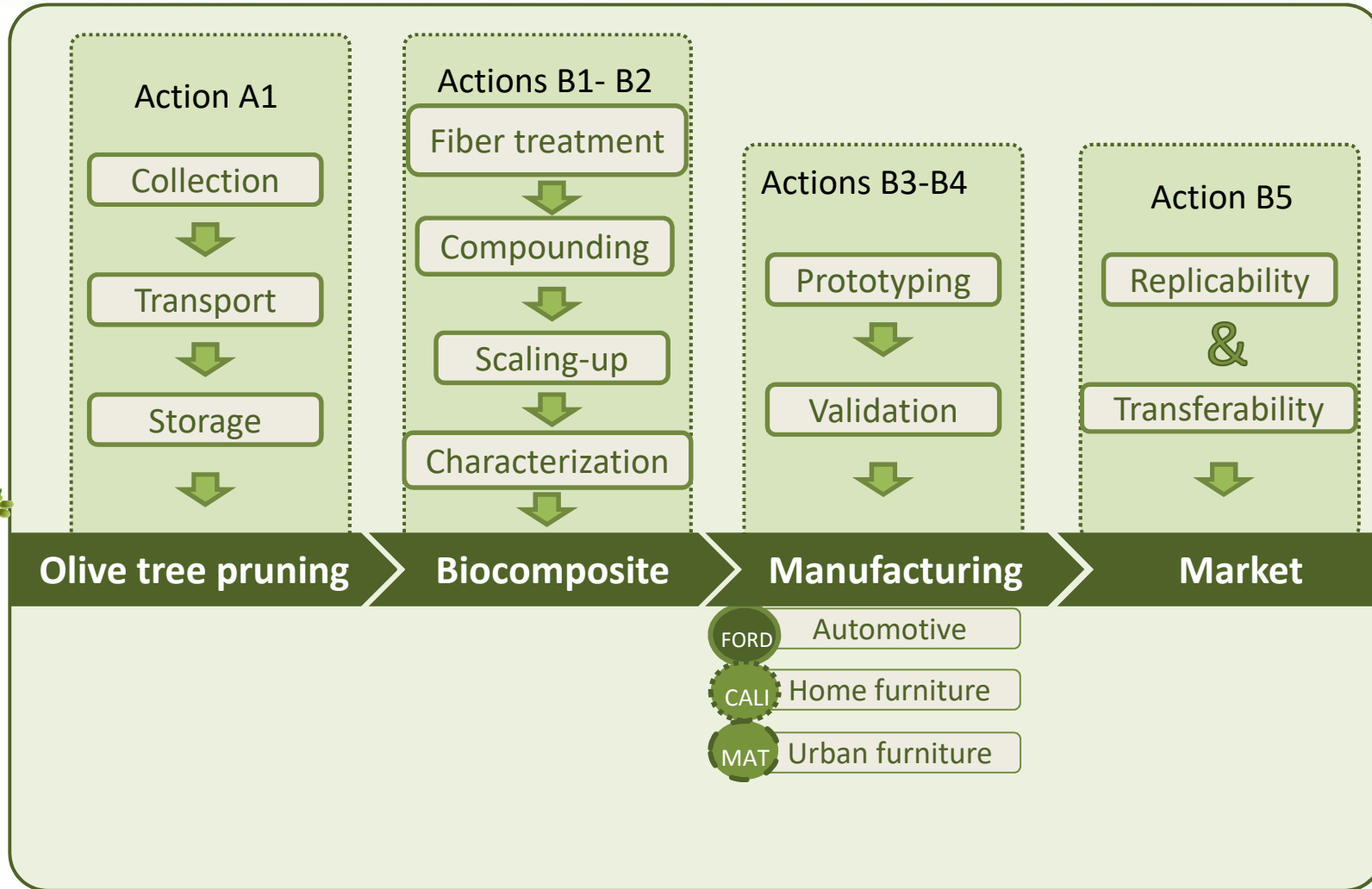
MP
MATRICERÍA PEÑA



Universidad
de Jaén

CITOLIVA





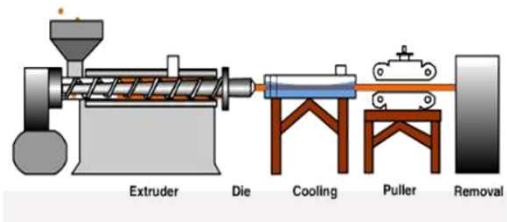
Collection of Olive Pruning and Pre-Milling



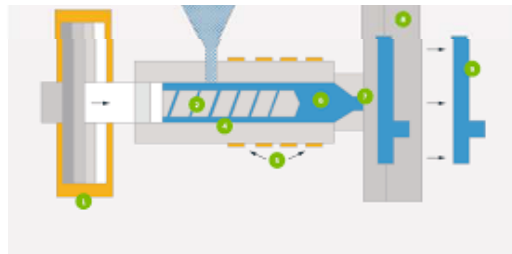
Chemical Treatment & Biocomposite Extrusion & Injection



Chemical treatment
at laboratory scale



Compounding of
biocomposite



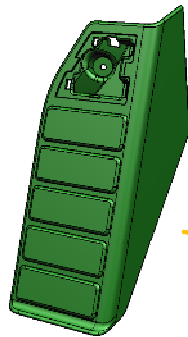
Injection
molding

Prototyping and Validation



Injection trials

FORD FOCUS FOOTREST



Prototyping and Validation

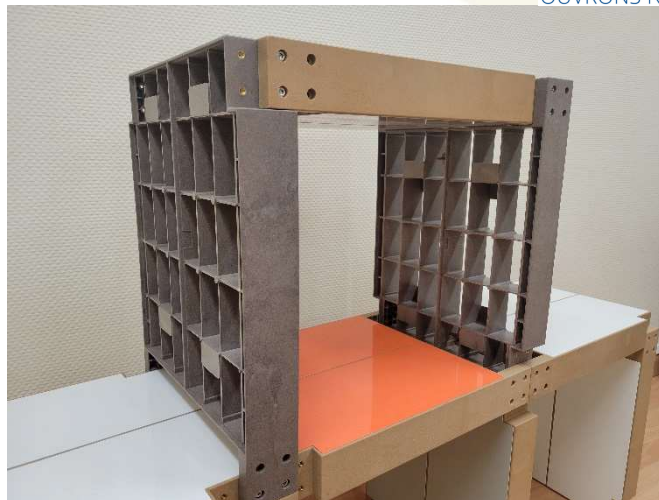
FORD MONDEO TRUNK TRIM



Prototyping and Validation



Urban furniture



Home furniture

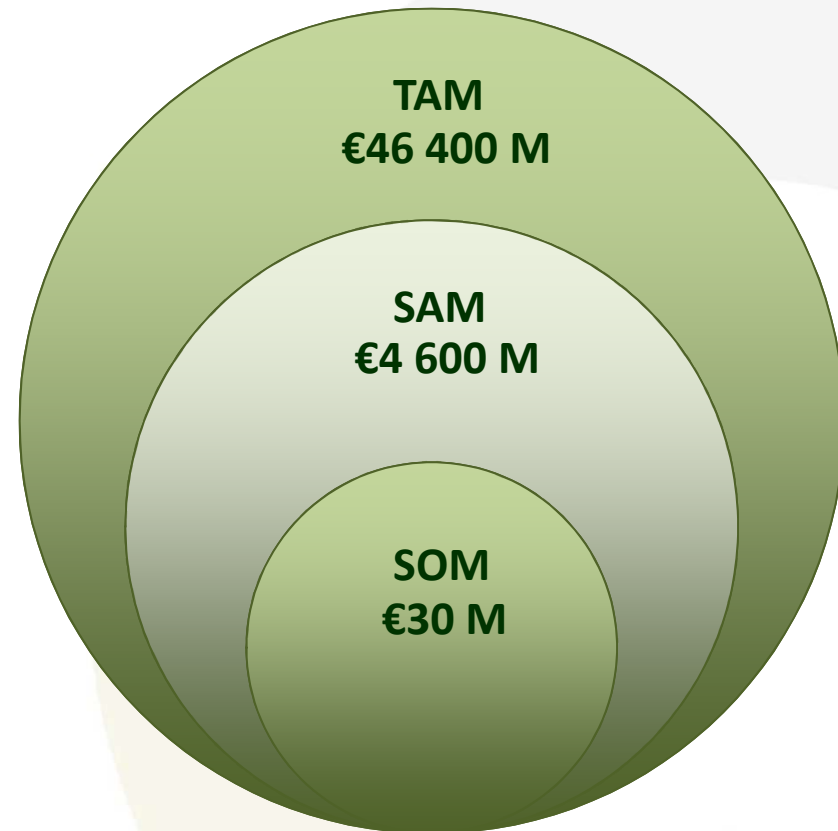


1. GENERAL PRESENTATION OF LIFE-COMPOLIVE PROJECT

2. MARKET OPPORTUNITIES

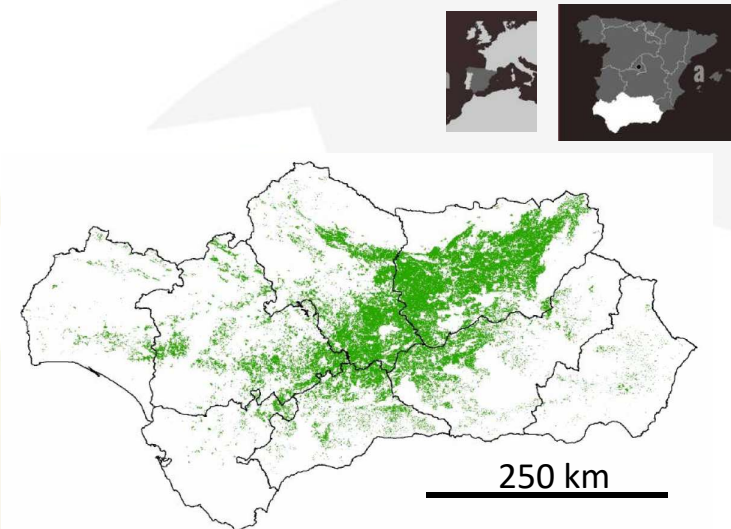
Market Potential

- (TAM, total addressable market).
Global biocomposites market:
TAM = €46 400 M
- (SAM, serviceable available market).
Global annual market of biocomposites in
automotive and furniture sectors:
SAM = €4 600 M
- (SOM, service obtainable market)
Expected global biocomposites market for the
industrial users of the project COMPOLIVE:
SOM = €30 M



Market Potential

- There are more **1.5 Mha** of olive groves in **Andalusia**.
- **1.5 tons of olive pruning** are produced per **ha** of olive grove and per **year**.
- Thus, more than **2.25 Mtons** of olive tree **pruning waste** are available per **year** in Andalusia.
- Thus, a total of around **2.25 Mtons** of COMPOLIVE **biocomposite** could be produced in **Andalusia** per year by using olive tree pruning waste.
- The production of the COMPOLIVE **biocomposite** could generate an **annual revenue of more than € 2300 M** in **Andalusia**.



Fuente: Unidad de Prospectiva. Consejería de Agricultura y Pesca. Junta de Andalucía

Olive groves in Andalusia

END-USERS

- Automotive: Vehicle manufacturers must use recycled materials.



DIRECTIVE 2000/53/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 18 September 2000
on end-of life vehicles

Article 4 Prevention

- In order to promote the prevention of waste Member States shall encourage, in particular:
 - vehicle manufacturers, in liaison with material and equipment manufacturers, to integrate an increasing quantity of recycled material in vehicles and other products, in order to develop the markets for recycled materials.

- Furniture: Markets demand more sustainable products

Challenges

- **Regional biomass resources: volumes and spatial distribution, seasonality**
 - **Gross potential – how big share of the potential can realistically be economical available (techno-economical potential)**
 - Quantity of olive pruning: 1.5 t/ha*year → 1.5 Mha (Andalusia) → 2.25 Mt/year → 2.25 M€/year.
 - **Long term availability of biomass supply – How can be this secured?**
 - The pruning of the olive trees is necessary to ensure the olive oil production.
 - **Barriers and solutions for biomass mobilization**
 - Barriers: i) poor accessibility in mountain olive groves, ii) branches of olive pruning need to be decreased in size to optimize transport efficiency
 - Solutions: to use portable and/or mobile machinery to reduce the size of olive pruning branches
 - **Suitable machinery and entrepreneurs available in the region.**
 - “Innolivar” project (www.innolivar.es).

Challenges

- **Biohubs: biomass storing terminals, updated to suit end-users' quality requirements → activities?**
- Shredded olive pruning can be stored. Shredding is a way to avoid plagues related to *Phloeotribus scarabaeoides*. Biohubs can be distributed around biorefineries. Moisture content should be controlled and not to increase from initial value of ca. 7%.
- **Multi actor partnership: roles and organization**
- Farmers, agricultural cooperatives, agricultural syndicates, owners of plastic sector companies, research and technology centers, universities, administrations, industrial end-users (furniture, automotive...).

Challenges

- **End-users' perspective on biomass supply and logistics: to secure and measure the quality of the biomass**
 - **Moisture content: > 15-20% is problem, biological activity, dry matter losses, fire, health problems**
 - The moisture of olive pruning is typically 7-10% → not a problem.
 - **Calorific value: fuel?** → Not in this project.
 - **Contaminations: stones, soil, etc.** → This should be solved in the processes of reduction of size of the olive pruning.
 - **Content of specific compounds: e.g. Sulphur alkali, process disturbing** → The olive fibers are chemically treated to improve the mechanical properties of the final biocomposite.
 - **Ash content: process disturbing** → No ash is produced in the process.
 - **Particle size distribution: feeding of the biomass and processing** → The size of olive pruning branches has to be reduced to that of short fibers.
 - **Freshness: Some chemical are volatile. Chipping and crushing accelerates volatility (handling & storing)** → Lignin is to be removed, whereas cellulose remains after the chemical treatment of the olive fibers.

CONCLUSIONS

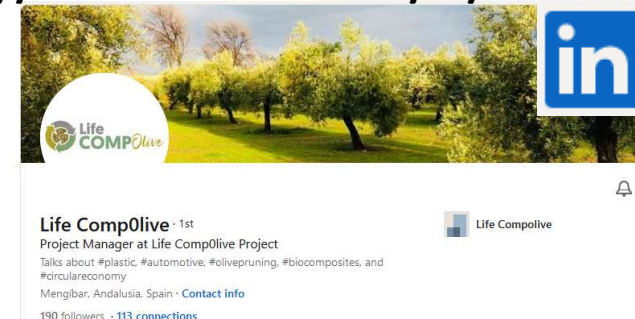
- **The LIFE-COMPOLIVE Project is an example of bioeconomy.**
- **The scaling-up of biocomposite production is nearly completed.**
- **The market potential is demonstrated.**
- **Challenges from End-users' point of view in relation to biomass supply are discussed.**

THANKS FOR YOUR ATTENTION !

<http://www.lifecompolive.eu/>



<https://www.linkedin.com/in/life-compolive/>



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