BRILIAN

Circular Future for Rural Areas

Project overview

The role of the circular economy and bioeconomy in supporting sustainable agri-food systems to promote sustainable rural/urban development in the EU

Ania Capraro – ENCO

22/10/24 – UNLOCK Networking Event

Circular Bio-based Europe Joint Undertaking

Bio-based Industries Consortium

Co-funded by the European Union

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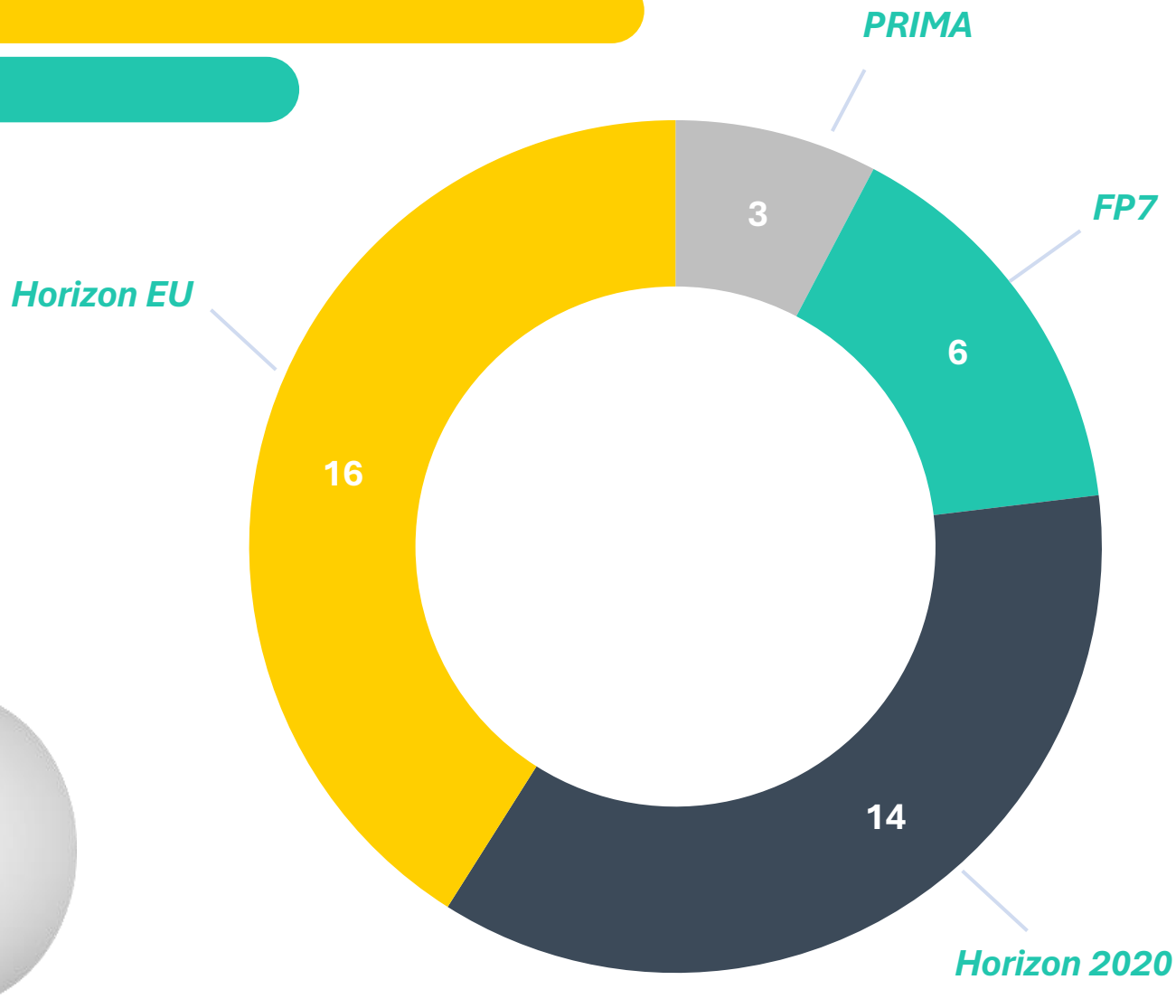

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- Agri-food
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BRILIAN AT A GLANCE

BRILIAN aims to support the adoption of sustainable and cooperative business models in rural areas in three pilots located in Italy, Spain and Denmark.

Feedstocks: cardoon, safflower, and sunflower (in Italy), potato rejections and process water (in Spain), and rapeseed (in Denmark) as feedstock.

The sustainable business models will encompass a wide range of high-value-added bio-products, such as vegan protein, additives for bioadhesives, biolubricants, biostimulants, bioherbicides, products for animal feed, bioplastics or the cosmetic applications.

BRILIAN will minimise environmental negative potentials by setting-up and optimising 10 bio-based value chains.

Increase in the products portfolio of primary production by valorising waste and by-products enabling primary producers to diversify their income while reducing risk and create new jobs.

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Project lead: CIRCE (Spain)

3 RTOs

3 SMEs

3 Large Companies

4 Clusters & Associations

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CONTEXT AND OBJECTIVES

- Currently, **rural areas cover approximately 80% of the European Union's territory**, containing 30% of its population (137 million people). Therefore, **they play a key role in improving the deployment of sustainable bio-based value chains** through various lines of action, such as sustainable food and raw materials, renewable energies, reduced fossil fuel dependence and biodiversity preservation.
- BRILIAN **motivation**:
  - **Biobased value chains** have become crucial to contribute to cope with upcoming challenges in EU and worldwide (crisis of raw materials supply, climate change, etc.).
  - Ensure a **just transition** and a fair share of benefits all along the biobased value chain and actors.
  - Alignment with the **Common Agricultural Policy** (CAP) while addressing also **Green Deal** and **Bioeconomy Strategy** objectives.

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- Exploiting existing opportunities to boost bioeconomy deployment:
  - Need of raw material for bio-commodities.
  - Interesting properties for several applications and markets.

- BRILIAN will implement a **multi-actor approach** for the validation of a group of **Actions for the Bio Innovation**, both at macro and micro level.
  - **a)** Forging robust rural bio-communities
  - **b)** Achieving circularity and sustainability
  - **c)** Integration of short supply chains
  - **d)** Production of value-added bioproducts

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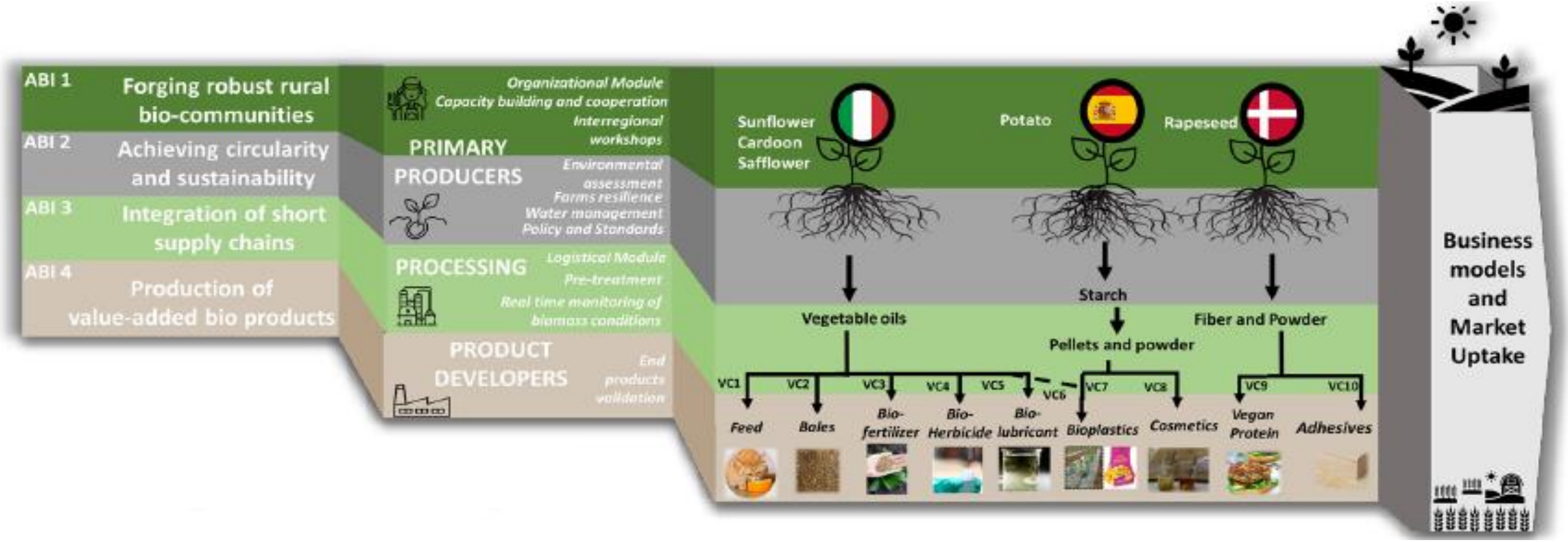
CONCEPT AND CHALLENGES



Brilian has different **side-streams** and **end-uses** (feed, cosmetics, agronomy, packaging, etc..) , carries out **different activities** (Advisory Board of Farmers, digital tools) and follows a **spiral methodology .**

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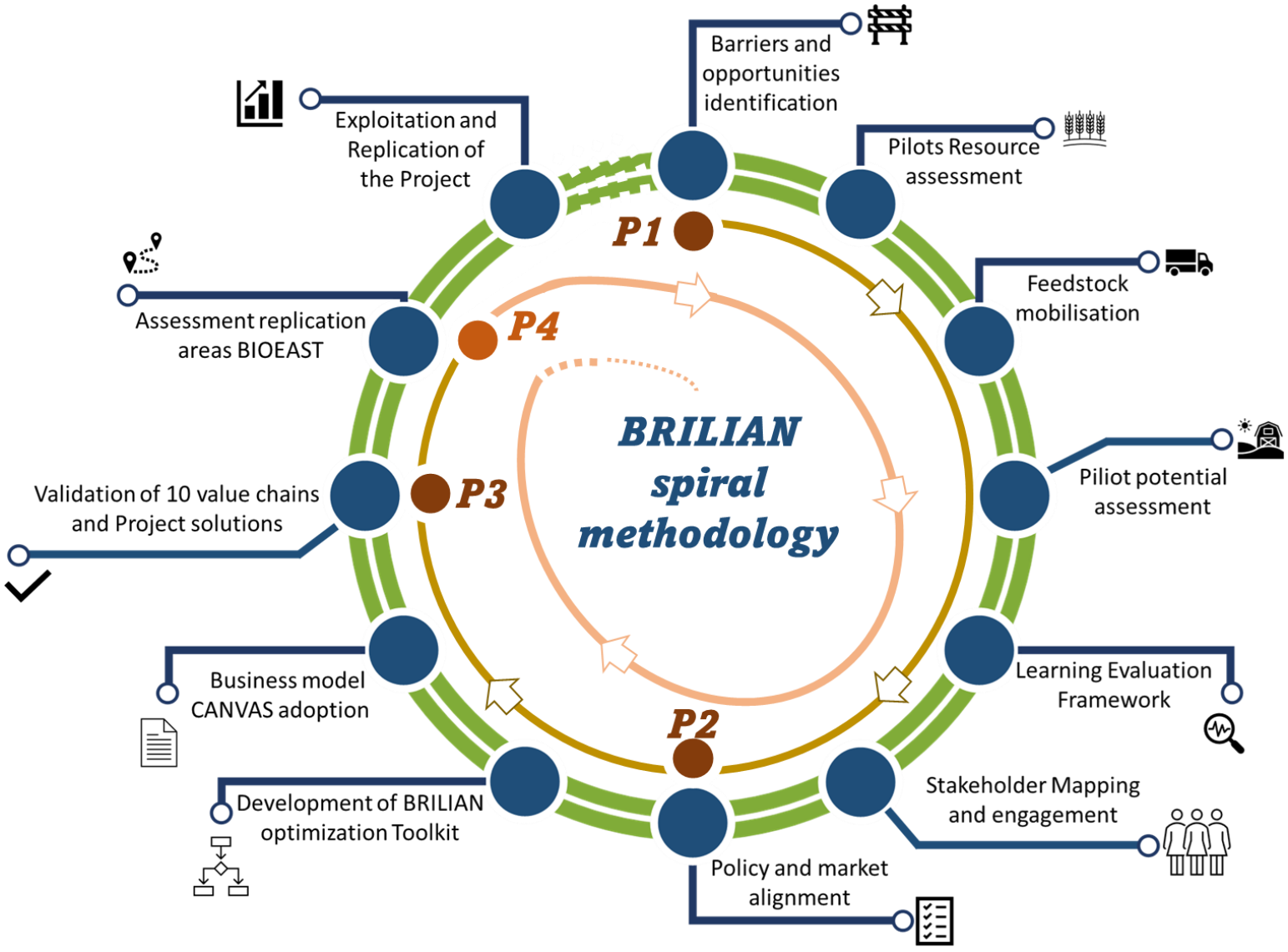

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CHALLENGES to address

- Demonstrate the sustainable supply of bio-based feedstock by setting effective and robust environmental sustainability and circularity criteria for bio-based systems.
- Political and legal barriers related with waste/by-products valorisation.
- Economic feasibility of biobased value chains.
- Address social aspects such as consumers acceptance, workforce skills, etc.
- Promotion of schemes enabling a decrease of the environmental impact.

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ACHIEVED OUTCOMES SO FAR

Impacts at local level:
Recovery of marginal and abandoned lands (46 ha) through regenerative agricultural practices engaging 8 farmers.

Policy Bulletin: first policy bulletin has been published. The most relevant outcomes will be extracted and shared with key stakeholders through the ABF.

Advisory Board of Farmers:
20 farmers and primary producers' clusters and associations
20 agro-industries and industrial players
20 research centers

Socio-economic:
Development of 10 multi-contractual agreements between primary producers and the industrial actors. By the end of the project more than 30 new jobs will be created in rural areas.

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OUTLINE OF THE THREE PILOTS			
	ITALY	**SPAIN**	**DENMARK**
Climate	Mediterranean	Continental	Oceanic
Type of feedstock	Agro-feedstock	Industrial food waste	Agro-feedstock
By-product/waste	Vegetable oil, residual biomass, oil cake	Organic wastes from potatoes processing	Rapeseed cake from rapeseed oil extraction
Primary Producer	Multiple cooperatives and individual farmers	Medium cooperative of farmers	Large cooperative of farmers
Biorefinery	Small scale ones as first stage and a large facility at the end	Pre-treatment facility and postprocessing units	Testing facilities to improve process
End-use	Animal feed; edible mushroom substrate; bioplastics; bio-fertilizer	Mulch films and shrink film	Vegan protein and adhesives

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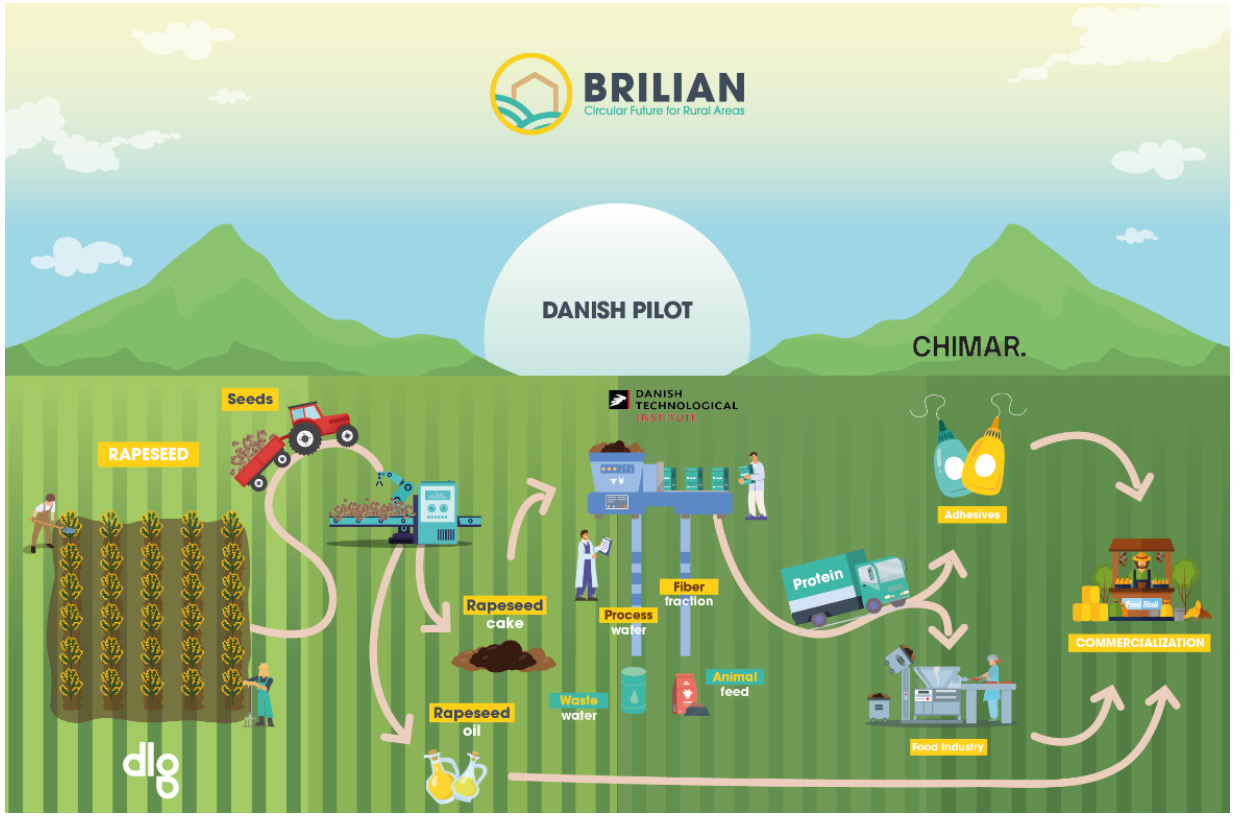

Danish pilot:

- **Protein content** reached 45-50% (objective) which can imply around **40% CO_2 emissions avoidance** in the process compared with using soybeans as raw material (vegan protein).
- The protein rich powders obtained in pilot trials will be **tested in different baking products** considering different replacement percentages.
- The protein was also tested for **bio-adhesive applications**. No synthesis issues were observed, at either **20% & 40% phenol substitution levels.**
- Strength results are very promising. Wood failure tends to reduce when substitution level increase. However, performance **satisfying the standard requirements** was achieved in all cases.

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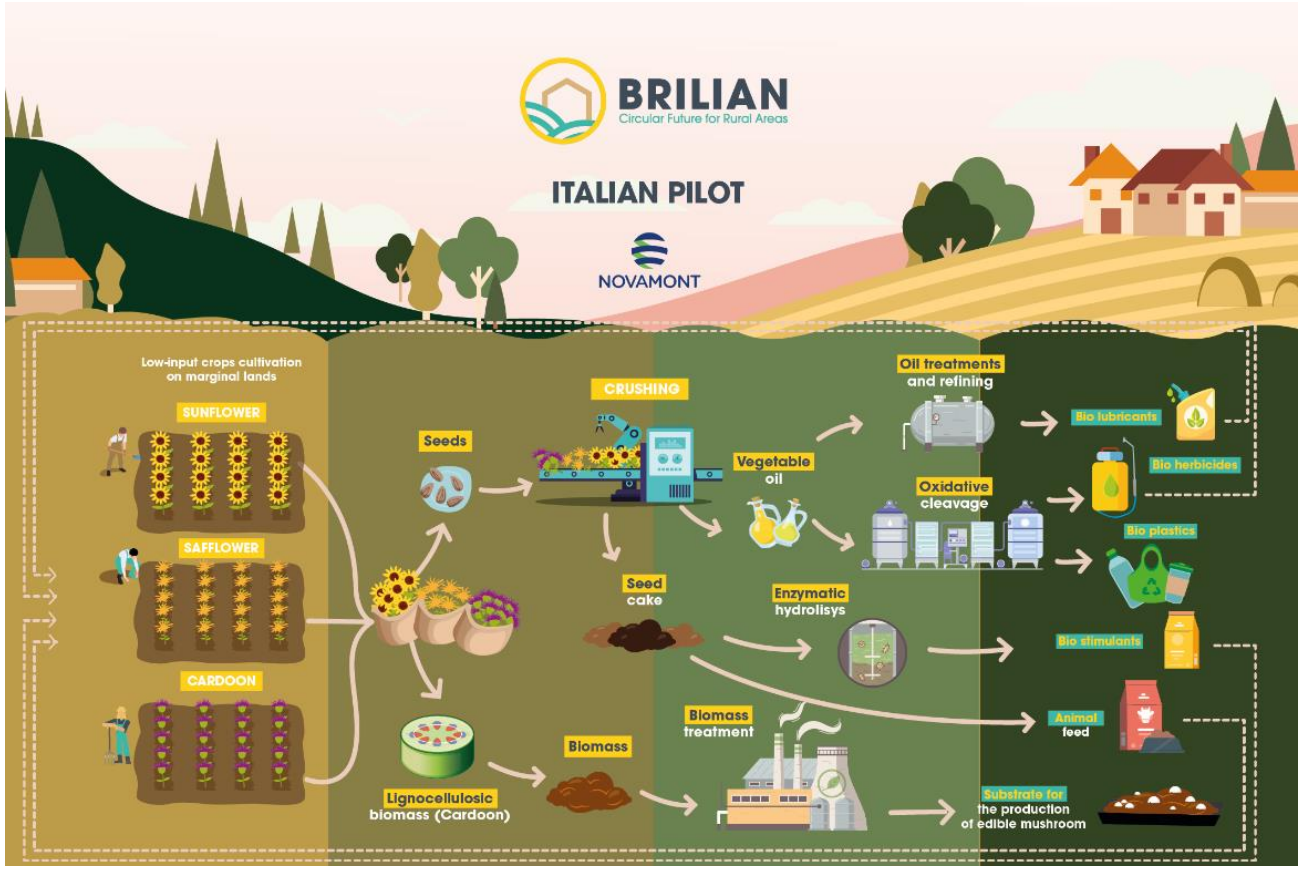

Italian pilot:

- The benefits and effectiveness of the **pelargonic acid** as **desiccant pre-harvest** have been tested with excellent results.
- Biomass of cardoon produced in 2024 is under testing to be **valorised for the production mushrooms balles**.

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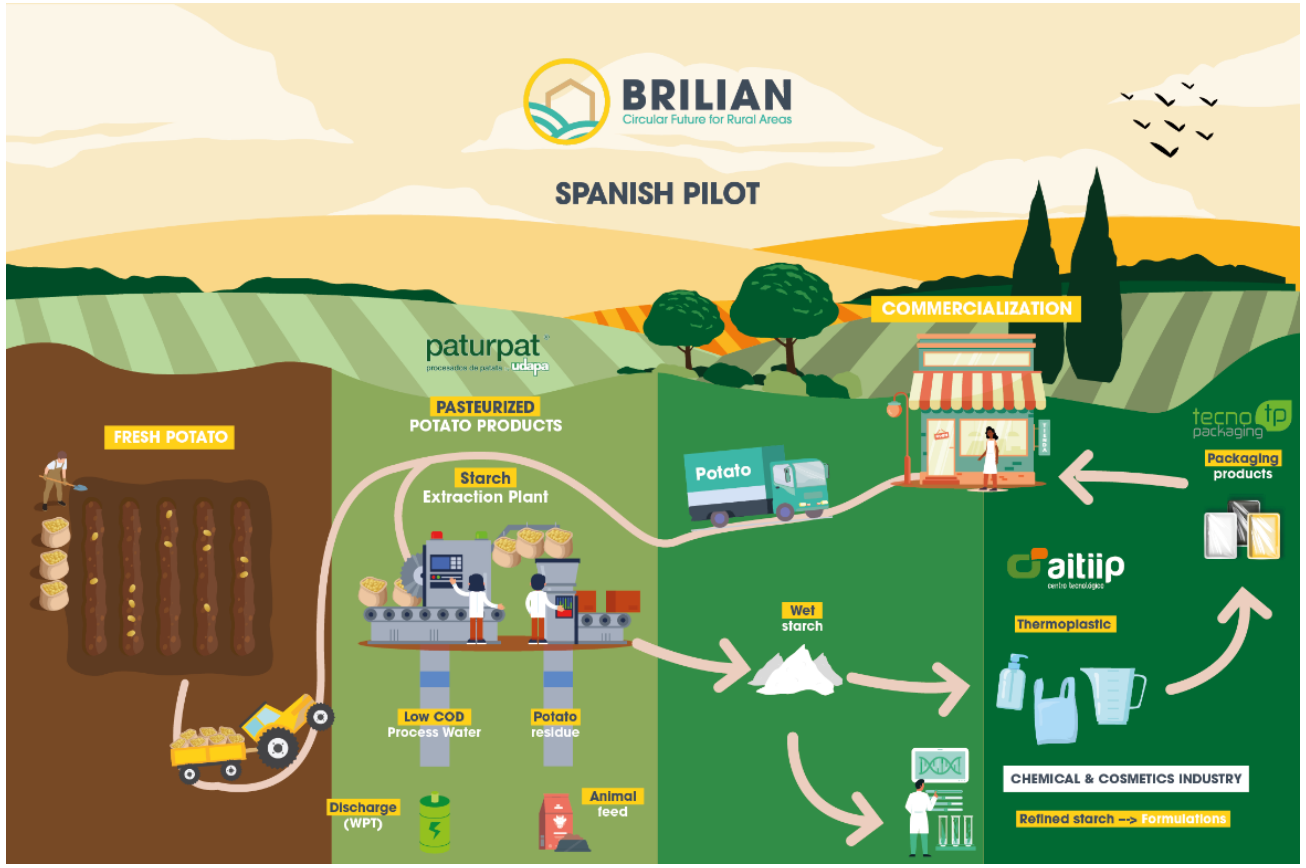

Spanish pilot:

- Starch extraction plant is **fully operational,** and the second batch of starch has been sent for the second set of tests. **The starch obtained has already been successfully tested to produce thermoplastics**. Two application are under evaluation: **stretch film and mulching.**
- The extraction facility process **140,000 m^3 of water yearly**. The extraction of starch **reduce by 90% the COD** in the water used in the process which in turn allows to recirculate the water.

Pilots: Fully operational (Spanish and Danish). Crushing facility foreseen in the Italian Pilot will be ready before next summer (2025).

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THANK YOU!

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