



**First open call for potential end users to obtain funding for testing and validating bio-based products.**

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## 1. INTRODUCTION

### 1.1. Overview of the PRIMED project & consortium

The EU has a significant amount of waste biomass available, more than 900 million tons per year, and 98% of this material ends up in landfill, incinerators, or rotting in open dumps. The EU has great potential to convert bio-waste into bio-based products that can be used in multiple bio-applications. This revalorisation can directly support 5-10 times more employment and generate 4-9 times more added value than when this biomass is used for energy.

Circular Business Models in Bioeconomy (CBMB) face many challenges to become sustainable and profitable. To overcome these challenges, PRIMED will co-create innovative forms of cooperation to integrate primary producers in novel bioeconomy value chains with a multi-actor approach. To do so, PRIMED will develop novel CBMB to produce high-value bio-based products through advanced biorefineries and will demonstrate them in five Living Labs (LLab).

The PRIMED CONSORTIUM is composed of 12 partners, including EU academic institutions and companies, from Belgium, Finland, Germany, Ireland, Italy, Norway, Portugal and Spain.

For more info visit <http://www.primed-project.eu/>

## 2. OBJECTIVES AND SCOPE

### 2.1. Objectives of the Open call

The primary objective of the first Open call is to identify and engage potential end users interested in testing and validating bio-based ingredients and products. These end users will play a pivotal role in implementing the knowledge generated throughout the project and demonstrate novel processes and circular business models with the active involvement of all stakeholders, including primary producers.

A minimum of one end user per LLab, with the possibility of up to two per LLab depending on the proposal's scope and budget flexibility, will be chosen to assess and validate bio-based ingredients and products. These ingredients and products should be integrated in new or existing production processes of the end users, fostering the development of collaborative CBMB.

### 2.2. Scope of the call

Proposals should focus on small-scale projects aimed at the development, testing, demonstration, and/or verification of new bio-based materials, technologies, ingredients or products with enhanced properties. Applicants' concepts must address specific industry challenges, ensuring relevance to the market and future adoption. Preference will be given to proposals targeting Technology Readiness Levels (TRL) 6-7 (prototype demonstration in a relevant/real environment).

### 2.3. Funded activities

End-users will receive funding based on their individual interest, enabling them to carry out:

- i) Laboratory analysis (e.g. feedstock, ingredient or product composition, purity and possible impurities, certifications analysis towards product prototype validation for target market).

- ii) Prototype experimenting related costs (e.g. purchase of needed reagents and materials).
- iii) Engineering support (e.g. installation or upgrading of equipment and commissioning).
- iv) Legal, financial and market assessments for IP freedom to operate.
- v) Market analysis focusing on regulatory strategy and/or validation of business plans.
- vi) Logistics.
- vii) Other related services (subject to approval by the LLab).

Furthermore, as part of the PRIMED project, end-user solutions will benefit from additional analyses conducted by PRIMED partners. These analyses include market analysis, techno-economic assessments, social impact quantifications, environmental impact assessments, feasibility studies, revenue models, cost-benefit analysis, investment plans, and other business planning documents tailored to the needs of end-users. The overarching goal of these analyses, along with end-users' feedback and experience, is to validate circular business models and value chains in collaboration with the LLabs.

### 3. Overview of the bioeconomy Labs.

#### 3.1. ALC Bio-Lab (ES)

**Leader:** ALCARRÀS BIOPRODUCTS

**Location:** Alcarràs, Lleida, Catalunya, Spain.

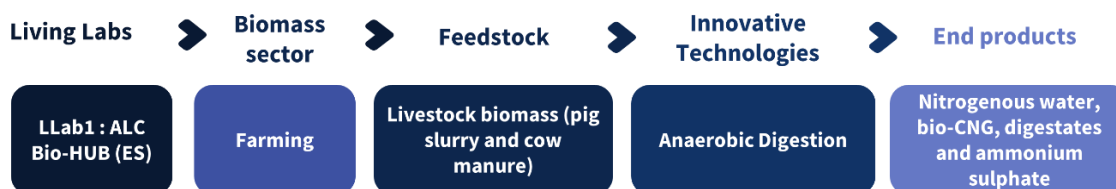
**Description:** ALC is a bio-industry park located in the municipality of Alcarràs in the province of Lérida. ALC was created by 150 families of primary producers (Agricultural Transformation Society) that involves more than 500 livestock farms.

**Feedstocks:** Livestock Biomass (pig slurry, cow manure) agricultural waste (rotten fruits, wood, straw), and fruit-tree pruning.

**Technology:** currently there is a compost plant with a maximum capacity of 54,000 tons/year. The AD plant is under construction. The AD plant is composed of one digester of 30 m of diameter and an annual capacity of 74,000 tons/year. In a second phase, a second digester will be built increasing the annual capacity to 10,000 tons/year. Other technologies will be included during the project, including cogeneration (a technology that allows the use of biogas to generate electricity and heat).

**End-products:** During AD, by-products such as digestate, ammonium sulphate, and **nitrogenous water** are generated, which are suitable for application as irrigation, biofertilizers or soil enhancers. To obtain these subproducts, a stripping-adsorption process is employed. The water generated from the stripping step can serve as irrigation water, with an anticipated volume of 27,000 m<sup>3</sup>, holds particular significance, especially for fertilizer companies in the area. Leveraging open calls presents an opportunity to capitalize on the value of this water. In addition, the remaining fraction from the separation of the digestate is solid, which can be applied directly on the field or revalorized by re-integrating it to the composting plant. In parallel, the biogas generated from AD can be commercialised by compressing it as bio-CNG (compressed natural gas), although this end product is limited by high logistical costs.

**Potential end-users:** Primary producers that can use the nitrogenous water by being reused for agriculture or biofertilizers companies. Another option can be the installation of charging units for agriculture engines.



In ALC, what gives value to the circular bioeconomy is that agricultural waste, i.e., material that we would normally reject, is treated to obtain new usable agrarian products: nitrogenous water, bio-CNG, digestates or ammonium sulphate. ALC will provide technical consulting to the selected end-user and will collect information on product quality, efficiency, among other characteristics of impact according to the end-user's application.

### 3.2. Bio-Silica Lab (PT)

**Leader:** CeNTI

**Location:** Vila Nova de Famalicão , Braga, Portugal.

**Description:** At CeNTI's Llab (Bio-Silica lab), the bio-based silica particles will be extracted from silica-rich agro-industrial residues pre-treated by physical processes.

**Feedstocks:** Agro-industrial residues (silica-rich residues).

**Technology:** technology to extract silica from agro-industrial residues is based on the sol-gel process. The biomass undergoes a pretreatment (ex. Milling, thermal treatment, freeze dryer, sieves), and then is used as a source of bio-silica. Functional silica nanoparticles (flame retardant, repellence and antimicrobial, among others subject to discussion between the end-users and the LLab) can also be produced.

**End-products:** non-modified silica particles or silica particles with enhanced properties (such as antimicrobial, flame retardancy or hydrophobicity).

**Potential end-users:** Any industry/company using synthetic silica particles (modified or not) in their processes, such as in the automotive, construction and textile sectors, among others.



The demonstration at CeNTI's living lab (Bio-Silica lab) will consist of the valorisation of agriculture and forestry silica-rich biomass by means of silica nanoparticles extraction and chemical functionalization, to be later tested at end-users' facilities, selected from the open call candidates.

In a first stage, the work to be performed at CeNTI’s living lab will consist in the pre-treatment of the biomass waste or fractions through physical processes to make them suitable for the extraction procedures. For this, the living lab is equipped with a cutting mill, ball mill, sieves, thermal ovens and a 10 L freeze drier. Once the biomass material is pre-treated, it can undergo the extraction processes (typically via alkaline digestion processes), recurring to a pilot scale reactor, and a high temperature thermal treatment in a pilot scale high temperature oven. This process yields up to 400 g of pristine silica particles per batch. Upon the requirements from the end-user, the surface of the silica nanoparticles can be chemically modified to impart added-value functionalities such as hydrophobicity, antimicrobial and/or flame retardancy, which will take place in a pilot scale reactor. Depending on the required property, the quantity of modified silica-based materials may range from 200 to 500 g/batch. At the end of each process stage, the output materials will be characterized (DLS, SEM, TGA, FTIR, contact angle, flame retardancy, antimicrobial, etc.) to ensure material and product compliance. The prepared (functional) biogenic silica particles will then be shared with the selected end-users, and further validation and feasibility testing at their facilities will take place in collaboration with CeNTI. At least 1 end-user (depending on the quantity of nanoparticles required it could be more) will be selected to validate the bio-based material in their end application. CeNTI will provide technical consulting to the end-users and will collect information on product quality, efficiency, among other characteristics of impact according to the end-user’s application.

### 3.3. Liguria Bio-Lab (IT)

**Leader:** FILSE

**Location:** Liguria (over the coming months, the precise location should be defined), Italy.

**Description:** Liguria Bio-Lab is based on an open territorial structure (regional) and works to demonstrate and to develop circular value chains in **bioplastics and value-added products from fishery waste and agro/food waste**, integrating existing knowledge, capitalizing on new research and innovation and building on public-private partnerships that place sustainable development at their core.

**Feedstock:** Fishing and fish-industry side-streams; Food-waste or/and agri-waste.

**Technology:** **Innovative pilot plants on** Biomass conversion, treatment and extraction tech are under construction; biodegradable films technologies.

**End-products:** Research is ongoing to produce new generation of Bio-actives and gelatine for high value-added food supplements and skin care products, fertilisers, biodiesel, bioplastics

**Potential end-users:** Any industry companies, start-ups, spin-offs, labs, and relevant players operating in all the economy sectors related with bioplastics, food additives, cosmetics or fertilizers.



FILSE acts as Liguria Bio Lab orchestrator, by linking research developers, services' and technologies' providers with industries, users and market. The LLab will involve the most important players in Liguria Region within circular economy and recycling value chains.

As main referring point, FILSE will connect potential end-users with research/technology/service providers, offering a tailored and specialised support from pilot testing to market analysis, economic assessments, feasibility studies, revenue models, cost-benefit analysis, investment plans, and business planning.

### 3.4. BioEire Lab (IE)

**Leader:** Irish Bioeconomy Foundation

**Location:** National Bioeconomy Campus, Lisheen, Co. Tipperary, Ireland.

**Description:** In BioEire Lab value chains and technologies, including fermentation and pyrolysis, will be mapped fostering connections within the Irish bioeconomy landscape to connect relevant biomass providers with technology providers and to end-users.

**Feedstocks:** Dairy by-products and forestry biomass.

**Technology:** Fermentation of dairy waste and Pyrolysis of forestry waste.

**End-products:** Biochemicals from dairy by-products, bio-based fertilisers /biochar from forestry biomass.

**Potential end-users:** Any industry companies, start-ups, spin-offs, labs, and relevant players operating in all the economy sectors related with lactic acid for biodegradable plastics, bio-based (biochar).



IBF partner will lead the production of the bio-based product (from dairy by-products and forestry biomass) and the validation with end-users. selection of a technology provider to produce bioproducts for applications. IBF will work primarily on two feedstocks and their relevant value chains and technologies, dairy to whey and forestry to biochar. IBF will design validation and breakthrough experiments in collaboration with the identified technology owners to raise Technology Readiness Level in the target value chains.

Service providers for engineering, quality control, and non-technical (legal/finance/regulatory) will be selected in order to either address gaps in the above value chain or identify blind spots or roadblocks of technical and non-technical nature standing in the way of the deployment of the value chain at and beyond the targeted TRL, in order to allow an informed and appealing decision making process by the targeted end users organisations approached during the living lab, as well as to enable the natural next steps of the KER exploitation plan.

### 3.5. CellFactory Lab (FI)

**Leader:** VTT

**Location:** Koivurannantie, Finland.

**Description:** CellFactory with help of plant biotechnology will produce plant cell culture biomasses to be studied as novel, innovative ingredients for food and cosmetic applications.

**Feedstock:** Agri-food side-streams e.g. side streams from vegetable processing industry (fresh or dried biomass or further processed e.g. fermented biomass).

**Technology:** Plant biotechnology more specifically plant cell culture technology (e.g. berry, coffee, avocado cell biomass production in fermenters).

**End-products:** Ingredients for novel food and cosmetic applications.

**Potential end users:** Any industry companies, start-ups, spin-offs, labs, and relevant players operating in all the economy sectors related with novel food and cosmetics.



VTT partner will lead the production of the bio-based ingredients from agro-food side streams and the validation with end-users. At first, we will evaluate and select suitable agri-food side streams (e.g. from vegetable processing industry) to be utilized as feedstock for plant cell cultures. We will develop needed pre-treatment processes for the side streams to facilitate their efficient use as carbon and nutrient source. We will study up to three different side streams in shake flask scale (50 to 100 ml) and scale the use of best performing ones in small pilot scale (up to 200l).

The plant cell culture lines to be cultivated with the agri-food side streams will be selected from VTT's proprietary collection [http:// culturecollection.vtt.fi/](http://culturecollection.vtt.fi/). We will focus on plant species having high environmental burden when cultivated via traditional agriculture or to plant species becoming rare (e.g. coffee, avocado, arctic bramble). The selection of plant species will be done together with food and cosmetic industry stakeholders. As a final output, we will produce two batches of 20 to 50 kg (FW) plant cell culture biomass to be validated by food and/or cosmetic industry end users in their bio-based products Validation of plant cell culture ingredients produced with agri-food side streams as feedstock together with food and cosmetic industry end-users. VTT will provide technical consulting to the end-users on the properties of the ingredient and will collect information on end-product properties, quality, and suitability together with the end user.

## 4. ELIGIBILITY

Applicants must:

1. Be for-profit legal entities.
2. Be established in EU member states or associated countries as listed in the Horizon Europe guidelines.



3. Have identified an opportunity to integrate a novel processed bioproduct into their production process, replacing a non-circular input.
4. Request a grant equal to or less than €50,000.
5. Commit the necessary human and other resources not covered by the grant that are necessary for the implementation of the project.
6. Adhere to all HORIZON EUROPE requirements regarding conflict of interest, confidentiality, security, and ethics.
7. Fulfil all further HORIZON EUROPE requirements regarding financial support to third parties, including visibility, specific rules for carrying out actions, and information and record-keeping.
8. Inform the PRIMED selection team about any situation constituting or likely to lead to a conflict of interests as detailed below:

Applicants must not have any current and/or potential conflict of interest with the PRIMED selection process and its provision. Applicants must formally and immediately notify the PRIMED consortium ([info@primed-project.com](mailto:info@primed-project.com)) of any situation constituting or likely to lead to a conflict of interests and take all the necessary steps to rectify this situation. All cases of conflict of interest will be assessed case by case. If a potential conflict of interest is discovered and confirmed at the time of the evaluation process, the application will be considered as non-eligible and will not be evaluated.

## 5. TIMELINE

- Submission period (17th June – 30th September)
- Eligibility check & proposal evaluation (1st October – 1st November)
- Technical and budget checks (with the LLabs) (1st November - 1st December)
- Announcement of selected end users and signing of grant agreements (4th December – 20th December)
- Implementation and monitoring (January – October 2025).

(The implementation period may be extended with the approval of the Llab and PRIMED Steering Committee)

## 6. GUIDELINES FOR APPLICANTS

- **Overview of instructions for potential end users on how to apply for participation in the living labs.**

All applicants must comply with the eligibility criteria and apply online by filling the **word template (ANNEX I)** and sending it to [info@primed-project.eu](mailto:info@primed-project.eu) with the email subject “First OPEN CALL PRIMED Project Application”. The use of English is mandatory and the filling of the form in another language would result in a not-eligible proposal.

The entity will select one LLab they wish to collaborate with. A same entity can submit different proposals to the call. In the case two proposals are very similar, only the latest submission will be taken into the account.

Also, **joint applications (involving more than one partner) are very welcomed.**

## 6.1. Criteria for evaluating proposals.

### 6.1.1. STEP 1 - Eligibility check

An initial eligibility check will be conducted by the PRIMED team to screen out non-eligible applications. The eligibility criteria are outlined in section 3. If the PRIMED team requires additional information for the eligibility check, applicants will be requested to provide clarifications. Applications marked as non-eligible (for not meeting one or more of the eligibility criteria) will receive a rejection message.

### 6.1.2. STEP – 2 Initial evaluation

Eligible applications will proceed to the preliminary evaluation conducted by the designated jury to select the most suitable proposals. The initial evaluation will be based on three main criteria, as outlined in the form structure. Each section will be scored on a scale of 1 to 5.

#### EXCELLENCE

- **Ambition:** Applicants must provide a description of the problem to overcome and/or the challenges to be addressed and how the proposed project goes beyond the state of the art.
- **Innovation:** Provision of a detailed description of how the proposed project fits into the objectives of the PRIMED project. It should be explained how it will solve the problem identified and how the PRIMED services will help. It has to be mentioned if the applicant/s has/have background knowledge including IPR related to the project.
- **Regulation, standardization, and certification issues:** Will the final product be subjected to any policies and/or regulatory requirements? Is there a need for standardization or certification related matters? In affirmative case, it has to be explained if they will be tackled.
- **Viability:** It has to be demonstrated the soundness and credibility of the proposed methodology and the activities proposed to implement the project.
- **Maturity:** It has to be provided a description of the TRL positioning of your proposed solution and the change from current state during the project.

#### IMPACT

- **Market opportunity:** Market potential of final product.
- A description of the competitive advantage of the applicant's solution has to be provided. What sustainability benefits of the final product versus the mainstream product it will substitute, especially environmental benefits comparing to mainstream products.
- **Commercial strategy:** commitment of the applicant to implement the project results in their production processes; strategy to penetrate the target market(s); what channels, resources and tools.
- **Scaling up and replicability potential:** Future potential of the business model to generate revenues and create jobs.
- **Potential impact of the business model on primary producers.**
- **Other expected impacts:** A description of any societal, environmental, and economic impacts.

#### QUALITY and EFFICIENCY of the IMPLEMENTATION.

- **Work plan description:** Is there a description of the work plan (key inputs, resources, tasks titles, time schedule)?

- Team: Demonstrate that the team has the skills to complete the project and introduce the product into their production processes.
- Budget estimation: A description of the resources required to complete the project, including personnel costs, other internal resources, and other external costs. If the application is a joint application, how the budget will be distributed between the partners.
- Own resources: How many staff resources (total person-weeks, where one person-week equals 40 hours dedicated by an employee to the project), equipment (machinery and other equipment to be used for the project), and material resources (consumables) are you willing to allocate to the project? (not covered by the grant)
- Risk management: A description of most relevant techno-economic and management risks has to be provided, together with a proposal of suitable mitigation strategies.

The maximum overall score is 15, with a threshold of 3 for Excellence, Impact, and Implementation criteria. Proposals failing to achieve the threshold score for each individual criterion will not be considered. In the event of a tie, end-users committing more co-funding will be ranked higher.

Proposals from each LLab will be ranked based on their scores. The top-scoring proposal from each LLab will proceed to a budget check with assistance from the LLab. (Step 3).

In the scenario where the two top ranked end-users similar scores (a difference below one point) and both have indicated flexibility in their budget, both proposals may be selected to advance to the final evaluation. To facilitate this, end-users will be asked if they can adjust their budget to equal or less than €25,000 by either reducing their activities or adding more external resources. If the top-ranked proposal has not indicated budget flexibility, it will be the only one selected for the final evaluation. Similarly, if the second proposal has not marked the budget flexibility, the third-place proposal may be selected (if its score is within one point to the top-ranked proposal and it has indicated budget flexibility).

The jury's decision is final and cannot be appealed.

### **6.1.3. Step 3 - Final evaluation**

Once the proposals have been scored, the top-ranking proposal/s for each LLab will be invited to engage in discussions with their selected LLab. The LLab will conduct a technical check of the proposed work to assess its feasibility and resource allocation.

Applicants will be required to contact service providers, selecting those offering the best value for money, who must confirm their ability to complete the scope of work within the allocated budget. If necessary, adjustments to the work plan may be suggested, provided they do not deviate from the stated objectives or impacts outlined in the application.

In the event of significant errors or project non-viability, the LLab may recommend declining the project, in which case the next project in the ranking list will be invited for discussions.

Once the project is deemed viable, the service providers will prepare service offers covering the scope of work. These offers will be sent to the applicant for approval. At this stage, the exact amount of the grant to be provided will be calculated. Selected applicants will then proceed to sign a grant agreement.

## 7. JURY

The submitted proposals will be evaluated by the Evaluation Board, comprising 4-5 evaluators. These evaluators will be experts with experience in research, innovation, and business, preferably with prior experience in proposal evaluation processes. They will be selected by PRIMED partners and may also be part of the consortium members, but they will not be affiliated with the Living Lab where the project will be conducted.

## 8. Responsibilities of selected end users

The selected end users commit to utilize the grant for the purposes agreed with each Llab. The budget allocated to end-users will be closely monitored to ensure effective utilization. Regular budget checks will be conducted to identify discrepancies or areas requiring adjustments.

Also, end users commit to share all relevant information requested by PRIMED partners and/or the European Commission about the agreed-upon activities and participate in networking events organized by the LLabs.

Further details on the responsibilities will be included on the grant agreements.

## 9. DATA PROTECTION

To process and evaluate applications, PRIMED will need to collect personal and industrial data. Cartago Ventures S.L. will manage the data submitted in compliance with the General Data Protection Regulation (EU) 2016/679 (GDPR). Each applicant will accept Cartago Ventures S.L. terms to ensure coverage. It should be noted that PRIMED requests the minimum information needed to deliver the evaluation procedure.

## 10. CONTACT

For any doubts or queries, please write and email to [info@primed-project.com](mailto:info@primed-project.com)