

**DELIVERABLE**

# **D1.1 PROJECT MANAGEMENT PLAN**

**CREIAMO Project - Circular economy in olive oil and wine sectors. Valorization of by-products and residues through innovative processes and new business models**

**2019**



## CREIAMO\_Project

Circular Economy in olive oil and wine sectors. Valorization of by-products and residues through innovative processes and new business models

**CREIAMO Project - Circular economy in olive oil and wine sectors. Valorization of by-products and residues through innovative processes and new business models**

**Partner:**

**University of Brescia** (Italy), Department of Civil Engineering, Architecture, Land, Environment and Mathematics.

**ENEA** (Italian National Agency for New Technologies, Energy and Sustainable Economic Development) – Sustainability Department. Environmental Technologies Technical Unit.

**University of Milano – Bicocca** (Italy), Department of Earth and Environmental Sciences (DISAT)

**Funded by**

Fondazione Cariplo

© Copyright 2019 Università degli Studi di Brescia

Piazza del Mercato, 15 - 25121 Brescia | Partita IVA: 01773710171 | Codice Fiscale: 98007650173 |

E-MAIL: [contact@creiamo-circulareconomy.com](mailto:contact@creiamo-circulareconomy.com)

Web site: <https://creiamo-circulareconomy.com/>

ALL RIGHTS RESERVED



Partner:



Funded by:



Via Branze, 43 CAP: 25123 Brescia (IT) | DICATAM – University of Brescia | Tel: (+39) 030 3711309

E-mail: [contact@creiamo-circulareconomy.com](mailto:contact@creiamo-circulareconomy.com) | <https://creiamo-circulareconomy.com>

## PROJECT TITLE

- ✓ Circular economy in olive oil and wine sectors. Valorisation of by-products and residues through innovative processes and new business models (CREIAMO).

## PRINCIPAL RESEARCHERS:

**MENTORE VACCARI:** Ph.D in Sanitary Engineering. Associate Professor of Sanitary and Environmental Engineering at the University of Brescia (Italy), Department of Civil Engineering, Architecture, Land, Environment and Mathematics.

**SILVIA SBAFFONI:** Ph.D in Environmental Engineering. Researcher at the ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development) – Sustainability Department. Environmental Technologies Technical Unit.

**ANDREA FRANZETTI:** Ph.D in Environmental sciences. Associate Professor of Microbiology. Course Applied microbiology and Environmental Sciences at the University of Milano – Bicocca (Italy), Department of Earth and Environmental Sciences (DISAT).

## GENERAL OBJECTIVE

The general aim of the project is to contribute to the reuse and valorization of residues and wastes from the olive oil and wine production chains.

## SPECIFIC OBJECTIVES

The project has 4 Specific Objectives (SO):

- SO1 Development of a new biological strategy to produce biosurfactants using wastes derived from the oil and wine production (WP2)
- SO2 Definition of the operating procedures to use the biosurfactants for the remediation of contaminated soil (WP3)
- SO3 Assessment of the impact of the processes and products through LCA studies (WP4)
- SO4 Promotion of cross-sectorial synergies among the companies (WP5)

## RESULTS

The expected results of the project are:

- 1) the isolation of at least two bacterial strains able to produce biosurfactants using the organic compounds present in the residues as substrates;
- 2) the production of at least two novel biosurfactants with the required level of yield and purity to be efficiently used in soil remediation;
- 3) the design of a new procedure for remediating contaminated soil by the mean of biosurfactant-enhanced processes;
- 4) the identification of the potential benefits in terms of impact coming from the entire life cycle of the new products as compared to conventional products and processes;
- 5) increase of the cooperation between companies through the sharing of resources (materials, water, energy, competences, etc.) via industrial symbiosis implementation. This will lead to both economic and environmental benefits with competitiveness increase for companies.

## EXPERIMENTAL PLAN

### METHODS AND ACTIONS PLANNED - ROLE OF PARTNERS

WPs and TASKS	UniBS	UniMiB	ENEA
<b>WP1 - PROJECT COORDINATION</b>	Leader UniBS		
T1.1 - Start-up of the consortium/Kick-off meeting	X	x	x
T1.2 - Coordination and monitoring of activities	X	x	x
T1.3: Budget management and reporting activities	X	x	x
<b>WP2 - PRODUCTION OF BIO-SURFACTANTS FROM RESIDUES OF OLIVE OIL AND WINE SECTORS</b>	Leader UniMiB		
Task 2.1 - Background and case study definition	X	x	
Task 2.2 - Isolation of bio-surfactants producers from residues of olive oil and winery residues	x	X	
Task 2.3 - Production Optimization and chemical characterization of bio-surfactants from residues of olive oil and winery residues	x	X	
Task 2.4 - Ecotoxicity Assessment of the biosurfactant produced before and after purification	x	X	
<b>WP3 - TREATMENT OF CONTAMINATED SOIL BY USING BIO-SURFACTANTS PRODUCED FROM RESIDUES OF OLIVE OIL AND WINE SECTORS</b>	Leader UniBS		
Task 3.1 - Bio-surfactant assisted washing of soil contaminated with hydrocarbons	X	x	
Task 3.2 - Bio-surfactant assisted bioremediation of soil contaminated with hydrocarbons	X	x	
<b>WP4 - ENVIRONMENTAL ASSESSMENT THROUGH LIFE CYCLE ASSESSMENT</b>	Leader UniBS		
Task 4.1 - Definition of scenarios and identification of system boundaries	x		X
Task 4.2 - Life Cycle Assessment (LCA) studies and environmental Life Cycle Costing (LCC) studies	X	x	x
<b>WP5 - INDUSTRIAL SYMBIOSIS FOR THE CROSS-SECTORIAL VALORISATION OF THE RESIDUES OF OLIVE OIL AND WINE SECTORS</b>	Leader ENEA		
Task 5.1 - Companies involvement campaign	X		x
Task 5.2 - Industrial symbiosis events (matchmaking) with companies	x		X
Task 5.3 - Analysis and elaboration of data on possible synergies. Preparation of operative manuals	x		X
<b>WP6 - COMMUNICATION AND DISSEMINATION</b>	Leader UniBS		
Task 6.1 - Project website and logo	X	x	x
Task 6.2 - Management of appropriate social platforms, e-newsletter	X	x	x
Task 6.3 - Promotional materials and publications	X	x	x

#### **WP1 – PROJECT COORDINATION (M1-M24)**

The specific objectives of this WP are:

1. to deliver efficient and effective management of the project technically, financially and administratively;
2. to manage and maintain clear communications among partners;
3. to manage IPR eventually generated.

All the partners will contribute as required to the project management in minimising risks, reporting impacts and progress for the project meetings and events.

#### **WP2 – PRODUCTION OF BIO-SURFACTANTS FROM RESIDUES OF OLIVE OIL AND WINE SECTORS (M1-M18)**

Objectives of WP2 are to obtain crude or partially purified water solution containing the biosurfactants produced starting from residues of wine and olive oil production. The biosurfactants should be produced at sufficient yield for the down-streaming environmental applications. The solutions should have ecotoxicological characteristics suitable for their release into the environment.

#### **WP3 - TREATMENT OF CONTAMINATED SOIL BY USING BIO-SURFACTANTS PRODUCED FROM RESIDUES OF OLIVE OIL AND WINE SECTORS**

The objective of this WP is to verify the efficacy of the biosurfactants produced in WP2 in the treatment of soils contaminated by Total Petroleum Hydrocarbons (TPHs) and Poly-Aromatic Hydrocarbons (PAHs). For this purpose, lab-scale tests will be carried out with soils specifically contaminated and with soils taken from real contaminated sites.

#### **WP4 – ENVIRONMENTAL ASSESSMENT THROUGH LIFE CYCLE ASSESSMENT (M6-M22)**

The objective of this WP is to verify that the bio-surfactants produced from residues of olive oil and winery residues have a better environmental impact assessment compared to the products they are replacing. This will be achieved using an eco-innovation-based approach implementing eco-innovation tools and life cycle sustainability assessment. The sustainability assessment will take in consideration environmental impacts by using the Life Cycle Assessment (LCA) methodology and economic evaluations by means of Life Cycle Costing. Each innovative solution described in WP 2 and WP 3 will be compared to the relative conventional scenario (products already existing and other EOL), according to the suggestions arising from the other WPs. The sustainability of the production processes and of residues valorisation is crucial for the transition from a linear economy model based on resource consumption and waste production, to a circular economy model based on the reuse of waste as a resource.

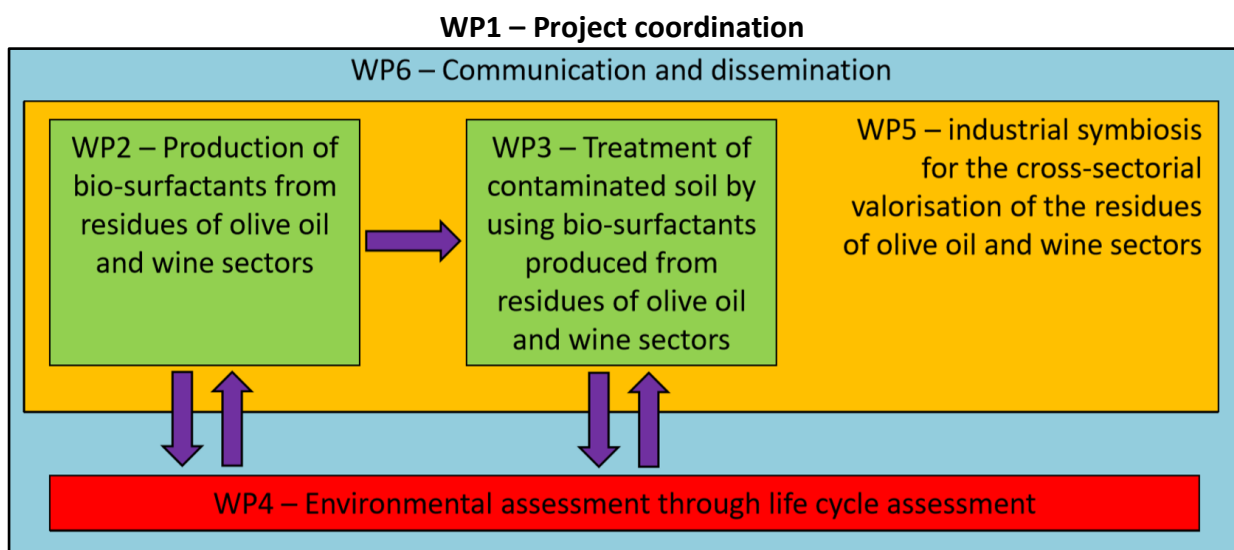
#### **WP5 – INDUSTRIAL SYMBIOSIS FOR THE CROSS-SECTORIAL VALORISATION OF THE RESIDUES OF OLIVE OIL AND WINE SECTORS (M6-M22)**

This WP aims at promoting industrial symbiosis pathways, bringing together the different industrial processes using the residues of olive oil and wine sectors. Industrial symbiosis is an association between two or more industrial facilities or companies in which the wastes or by-products of one become the raw materials for another. Industrial symbiosis can help companies to reduce raw material and waste disposal costs, earn new revenue from residues and by-products, divert waste from landfill and reduce carbon emissions, open up new business opportunities. These benefits will lead to an increase in the competitiveness of companies.

### WP6 – COMMUNICATION AND DISSEMINATION (M1-M24)

WP6 will define and implement the strategy for the dissemination and exploitation of the results in order to increase the project's impact on local, national and European. The specific objectives are as follows:

- To communicate the objectives of the project and its results to relevant stakeholders, with special attention to companies and decision makers.
- To disseminate the progress made in the project to national and European networks events, in which scientists, practitioners and companies share experiences in the field of circular economy.
- To identify potentials for further collaboration projects.
- To plan and implement the exploitation of the project's outcomes.
- To approach the market by implementing innovative business models.



### EXPECTED OUTPUTS

The expected outputs of the project are:

- creation of awareness among stakeholders concerning circular economy and potential benefits coming from the implementation of circular economy strategies applied to wine and olive oil sectors;
- identification and development of innovative processes for the production of high added values products (bio-surfactants) from the residues of wine and olive oil sectors;
- identification and development of innovative processes for the environmental use (treatment of contaminated soil) of bio-surfactants derived from the residues of wine and olive oil sectors;
- cooperation between companies through the implementation of industrial symbiosis pathways in the view of achieving economic and environmental benefits (win-win strategy);
- training and involvement of young researchers;
- development of the project and the dissemination activities according to the principles of a Responsible research and innovation (RRI) approach.

## MILESTONES

N.	Name	Month of achievement	Responsible
M1.1	Kick-off meeting organized in Brescia	M1	UniBS
M1.2	Projects review meetings via Telcos or Meetings	M6, M12, M18, M22	UniBS
M1.3	End of funding period and closure of the activities	M24	UniBS
M2.1	Case study defined	M4	UniBS
M2.2	Isolation of bio-surfactants producers from residues of olive oil and winery residues	M12	UniMiB
M2.3	Production Optimization and chemical characterization of bio-surfactants from residues of olive oil and winery residues	M12	UniMiB
M2.4	Contract for consultancy	M6	UniMiB
M3.1	External chemical analyses	M12	UniBS
M3.2	Contract for consultancy (agronomist)	M12	UniBS
M3.3	Treatment of contaminated soil by using bio-surfactants from olive oil and winery residues	M20	UniBS
M3.4	Technical/economic feasibility of the process	M20	UniBS
M4.1	Environmental and sustainability verified	M10	UniBS
M5.1	Stakeholder and companies involved in industrial symbiosis working tables	M10	ENEA
M6.1	Project web site	M3	UniBS

## TIMETABLE

WPs and TASKS	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24
<b>WP1</b>																								
T1.1																								
T1.2																								
T1.3																								
<b>WP2</b>																								
Task 2.1																								
Task 2.2																								
Task 2.3																								
Task 2.4																								
<b>WP3</b>																								
Task 3.1																								
Task 3.2																								
<b>WP4</b>																								
Task 4.1																								
Task 4.2																								
<b>WP5</b>																								
Task 5.1																								
Task 5.2																								
Task 5.3																								
<b>WP6</b>																								
Task 6.1																								
Task 6.2																								
Task 6.3																								

**MONITORING AND EVALUTION PLAN (M&E)**

The monitoring and evaluation plan (M&E) will be developed during and at the end of the project, using a scheme that includes the following elements, defined by the project partners, as exemplified in the following figure:

- baseline
- targets
- results indicators (Output/Outcome/Impact)
- time schedule initially planned and month of completion / Number of result to current date
- % project completion

WPs and TASKS	UniBS	UniMiB	ENEA	ACTIVITIES PROJECT	BASELINE	TARGETS	RESULTS INDICATORS <small>(They will measure the extent to which a project objective is being achieved)</small>			Monitoring and Evaluation (M&E) <small>Plan</small>		
							Output	Outcome	Impact	Month of completion	Number of result to current date	Project completion (%)
							<b>WP1 - PROJECT</b>					
T1.1 - Start-up of the	X	x	x									
T1.2 - Coordination and	X	x	x									
T1.3 - Budget management and	X	x	x									
<b>WP2 - PRODUCTION OF BIO-SURFACTANTS FROM RESIDUES OF OLIVE OIL AND WINE</b>										Leader UniMiB		
Task 2.1 - Background and case study definition	X	x		Identify and characterize residues from olive oil and wine sectors suitable for the biosurfactant production by the selected bacteria strains.								
Task 2.2 - Isolation of bio-surfactants producers from residues of olive oil and winery residues	x	X		Isolate an efficient biosurfactant (BS) with several microbial enrichments, incubated under numerous potential BS producers with respect to the existing bacterial collection in DISAT-UniMiB. The production capacities of BS of the isolated strain will be compared								
Task 2.3 - Production Optimization and chemical characterization of bio-surfactants from residues of olive oil and winery residues	x	X		Study of the biodiversity and identification of selected consortia and bacteria. Improve the standard media using low costs carbon sources for growing the selected BS. The optimization of these microbial surface-active agents will be achieved using experimental design methods, after micelle concentration (CMC), and partial chemical characterization of the BS will be also Evaluation of the activity of both purified and semi-purified will be performed. the BS in a large scale in order to reach high BS-yield of production for the targeted application foreseen in WP3.								
Task 2.4 - Ecotoxicity Assessment of the biosurfactant produced before and after purification	x	X		The ecotoxicity assessment of the produced BS and the oil and wine sector residues using both Earth worm and Daphnia magna toxicity tests.								
<b>WP3 - TREATMENT OF CONTAMINATED SOIL BY USING BIO-SURFACTANTS PRODUCED FROM RESIDUES OF OLIVE OIL AND WINE SECTORS</b>										Leader UniBS		
Task 3.1 - Bio-surfactant assisted washing of soil contaminated with hydrocarbons	X	x		Lab-scale washing tests will be performed to compare traditional surfactants and The contaminated soils will be characterized to define their grain size distribution and chemical-physical characteristics, as well as the TPHs Germination tests will be carried out to evaluate the potential agricultural reuse of the Lab-scale test will be carried out to treat the wastewater originated by soil washing.								
Task 3.2 - Bio-surfactant assisted bioremediation of soil contaminated with hydrocarbons	X	x		performed with and without the bio-surfactants produced in WP2. The same contaminated soils used in the Task 3.1 tests will be used here, too. Before the tests, the contaminated soils will be characterized to define their grain size distribution and chemical-physical UniMiB will perform microbiological analyses of soil before and after treatment. be quantified at the end of the tests; moreover, germination tests will be carried out to evaluate the potential agricultural reuse of the								
<b>WP4 - ENVIRONMENTAL ASSESSMENT THROUGH LIFE CYCLE ASSESSMENT</b>										Leader UniBS		