

# MicroalgaE biomass from phototrophic-heterotrophic cultivation using olive oil Wastewaters - MEWLIFE

**PROJECT LOCATION:** Italy / Greece

## BUDGET INFO:

**Total amount:** 1,776,990 €




**% EC Co-funding:** 1,065,606 €

**DURATION:** 36 Months

**Start:** 01/07/18 - **End:** 30/06/21

## PARTNERS:



 <b>Processi Innovativi</b>	Processi Innovativi srl <i>Italy</i> Coordinator
	Bio-P srl <i>Italy</i> Associated Partner
 <b>HTR</b> HIGH TECH RECYCLING	High Tech Recycling <i>Italy</i> Associated Partner

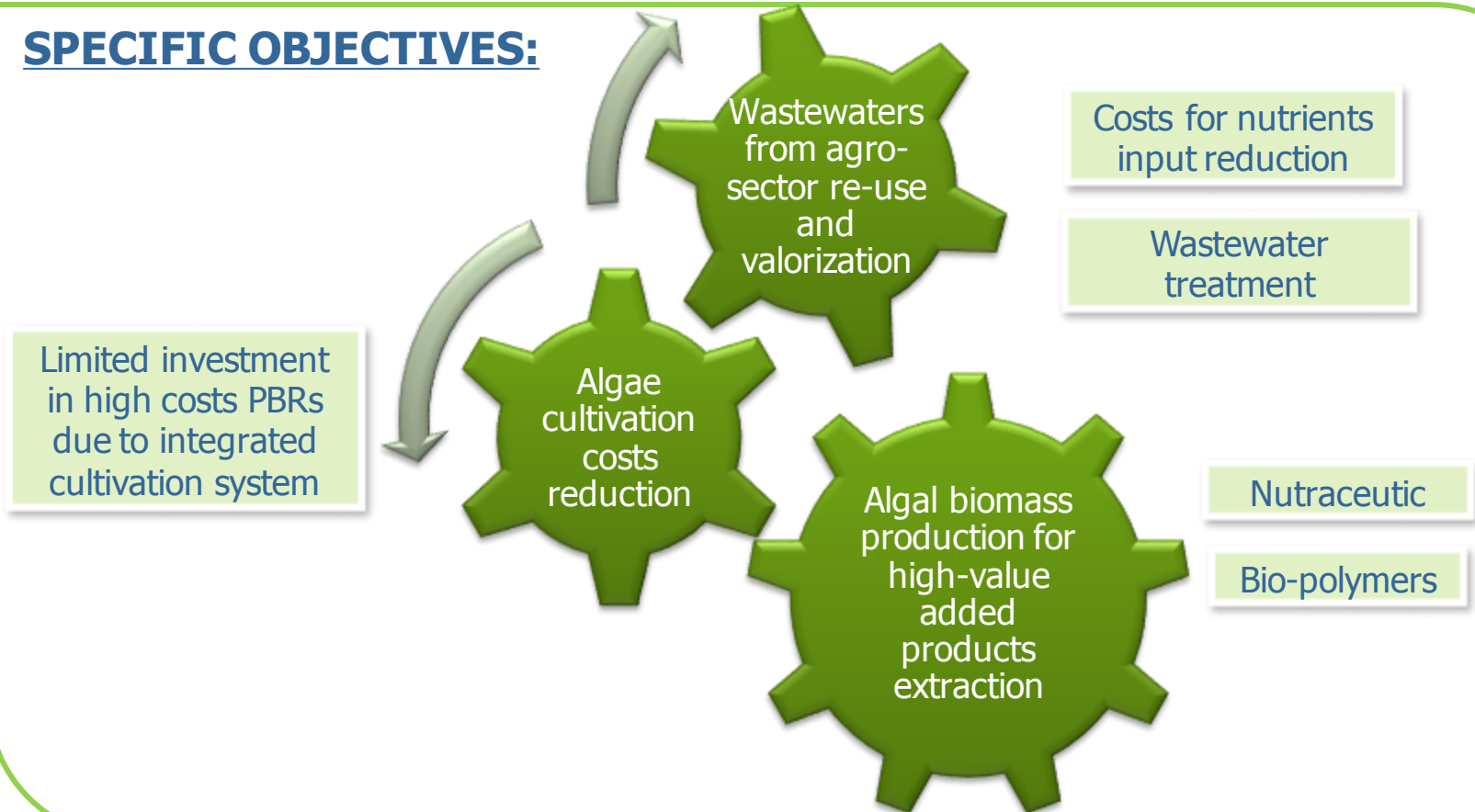
 <b>LABOR</b> INDUSTRIAL RESEARCH LAB	Labor srl <i>Italy</i> Associated Partner
	Technosind srl <i>Italy</i> Associated Partner
 <b>MEGARA RESINS</b> ANASTASSIOS PANIS S.A.	Megara Resins <i>Greece</i> Associated Partner

# OBJECTIVES & SCOPE

## SCOPE:

Demonstrate the *environmental benefit* and *economic feasibility* of an *innovative approach* to produce *microalgal biomass* in an integrated phototrophic and heterotrophic cultivation system using pre-concentrated olive oil wastewaters as carbon source for growing algae.

## SPECIFIC OBJECTIVES:



# EXPECTED IMPACTS

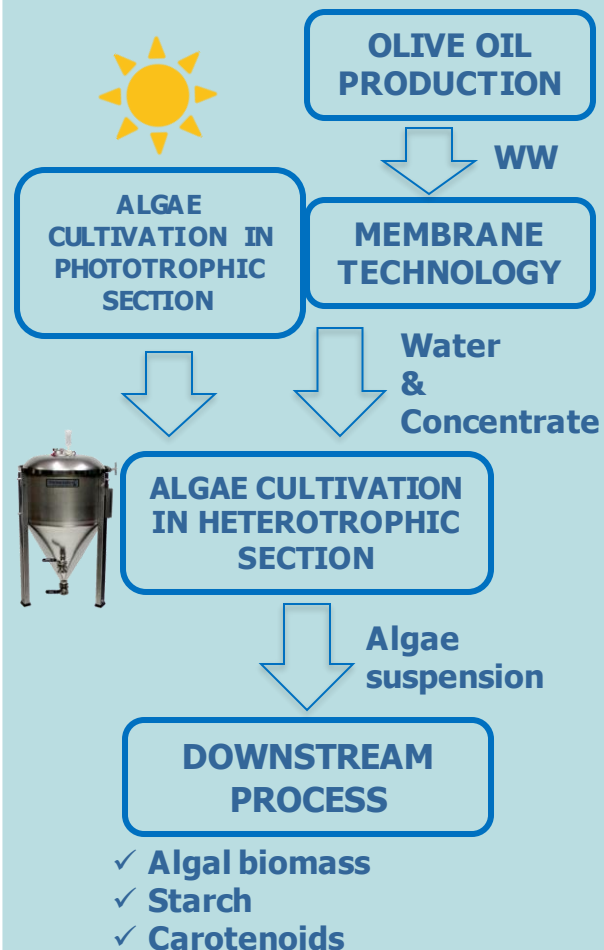
## TARGET ENVIRONMENTAL PROBLEM

- ✓ EU produces about 70% of the world olive oil (Spain, Italy and Greece as main producers).
- ✓ Wastewaters from olive oil plants cannot be treated in conventional biological depuration plants due to the toxic effect of antioxidants (PPs) on active sludge.
- ✓ As results, these wastewaters are discharged in the environment acting as anti-microbial and phytotoxic agents.

Lebanon News  
Nov 13, 2017 | 12:16 AM (last Updated: November 13, 2017 | 04:49 PM)  
 Olive oil production method generates pollution, damages river



## PROPOSED PROCESS



## INDICATOR

## ESTIMATED IMPACT

1<sup>st</sup> line: at project end  
 2<sup>nd</sup> line: 5 Y after project end

Reduction /  
substitution  
of dangerous  
substances

### Polyphenols

- 100 kg/y (60%\*)
- 8.6 ton/y (60%\*)

Waste  
management

### COD abatement

- 680 kg/y (35%\*)
- 60 t/y (35%\*)

### WW treated

- 40 m<sup>3</sup>/y (33%\*)
- 3,600 m<sup>3</sup>/y (100%\*)

Water

- 32 m<sup>3</sup>/y of **purified water** (80%\*)

- 2,880 m<sup>3</sup>/y of **purified water** (80%\*)

used in algae  
cultivation section

\*: % improvement with respect to current situation, treating WW in membrane plant + using WW concentrates as algae feed

PPs: Polyphenols

WW: Wastewater

COD: Chemical Oxygen Demand

# POLICY IMPLICATIONS

## Level

### European initiative

### European initiative

### European initiative

## Directive/ Strategy

**Water Framework  
Directive  
2000/60/EC**

✓ **Thematic Strategy on  
the Prevention and  
Recycling of Waste  
COM (2005) 666**

✓ **Waste Framework  
Directive  
2008/98/EC**

**Legislative proposal on  
fertilisers  
(March 2016)**

## Indications

Framework for  
Community action in the  
field of **water** policy.

It aims to achieve 'good  
status' for all ground and  
surface waters.

The basic objectives of  
current EU waste policy  
are to prevent waste and  
promote **re-use**,  
**recycling** and **recovery**  
with the aim to reduce the  
negative environmental  
impact.

EC proposed a Regulation  
(as announced in the  
Circular Economy Action  
Plan) that will create  
market for fertilisers made  
from secondary raw  
materials, thereby turning  
waste management issues  
into economic  
opportunities.

## Project contribution

MEWLIFE project focuses  
on the treatment of  
wastewater from agri-  
food sector preventing  
the **groundwater  
pollution**.

MEWLIFE project aims to  
**avoid wastewater  
disposal** demonstrating  
how nutrients in  
wastewater can be  
transformed in  
**biomaterials** for  
nutraceutical and bio-  
plastic fields.

In MEWLIFE project a  
portion of the treated  
wastewater by membrane  
technology could be apply  
as **compostable sludge**,  
respecting the Circular  
Economy Action Plan.

# CONTINUATION, REPLICATION, MARKET UPTAKE

## CONTINUATION

The **prototype** realized in the MEWLIFE project will have a productivity of about **1 ton/year** of dry algal biomass (**TRL6**).

In the 5-years projection after project end, an **industrial plant** is expected with a productivity of **60 ton/year** of dry algal biomass (**TRL9**).

## REPLICATION

The **replicability** of the developed process using **other agro-wastes** (i.e whey in addition or in alternative to organic concentrates from vegetation waters) will be addressed.

The **replicability** of the developed process **to other EU countries** will be also addressed. Greece was chosen as target country (Greek partner in the consortium and Greek scenario very similar to the Italian one).

## MARKET UPTAKE

**Nutraceuticals**  
The production of microalgal biomass for nutraceutical application is widely diffuse all over the world for feed and food application with an **annual turnover of 80 millions US\$**.

**Bio-polymers**  
Bio-plastics volumes in the market are growing: the current niche market for the bio-polymers, mainly for packaging and agriculture (less than 1% of the total plastic market), shows **high potential**.