



# Nutrients and regenerated water recycling in WWTPs through twin-layer microalgae culture for biofertilizers production

LIFE13 ENV/ES/000800 (TL-BIOFER)



LIFE+ TL-BIOFER represents an advanced tertiary treatment to meet the Directive 917271/EEC, especially in small populations and areas with demanding quality objectives



## Associated Beneficiaries:

BIO-LOGICAL SOLUTIONS S.L., Spain

[www.bio-logicals.com](http://www.bio-logicals.com)

EMPRESA PROVINCIAL DE AGUAS DE CORDOBA S.A., Spain

[www.emproacsa.es](http://www.emproacsa.es)

UNIVERSITY OF COLOGNE, Germany

[www.melkonian.uni-koeln.de](http://www.melkonian.uni-koeln.de)

## Project duration and Budget

36 months: July 1 st, 2014 - June 30 th, 2017

Total amount: 1,097,092 €

EU financial contribution: 548,546 €

## Coordinator contact

BIOMASA PENINSULAR S.A.

[www.bpeninsular.com](http://www.bpeninsular.com)

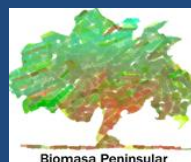
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For more info:  
[www.life-tlbiofer.eu](http://www.life-tlbiofer.eu)



TL-BIOFER Project is co-funded by the European Union, LIFE+2013 Programme

## ➤ Background

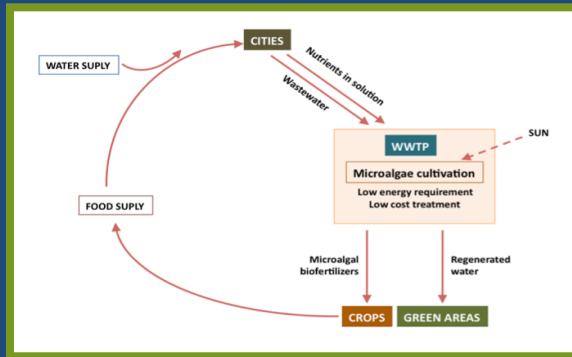
Human activities have a significant negative impact on the environment, affecting the biogeochemical cycles of Carbon, Nitrogen and Phosphorus. Sanitation and wastewater systems even when treatment is provided are the main cause for “point source pollution”, leading to groundwater pollution and eutrophication of surface continental and coastal water.

## ➤ Main EU Policy Targeted

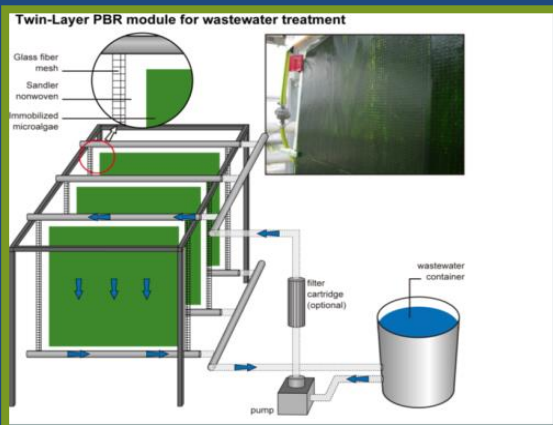
Water Framework Directive requires a good ecological status for natural water bodies across the EU by 2015, with specific targets for wastewater discharges fixed by Directive 91/271/EEC on urban wastewater treatment, more stringent in “sensible zones”.

## ➤ Project Objectives

The LIFE+ TL-BIOFER project aims to address the N and P removal at small and medium-size wastewater treatment plants suitable for specific discharge quality at “sensible zones”.



To reach this Objective, the TL BIOFER Consortium plans to implement two main actions:



**1º. Developing and operating a Twin Layer (TL) prototype**, based on a laboratory model by the University of Cologne, consistent of a serial vertical layers photobioreactors for immobilized microalgae cultures.

**2º. Developing and testing new microalgae bio-fertilisers**, that will meet high agronomical standards as well as current and future EU fertilisers regulations. The trials will be conducted in microplots for two different crops in northern Italy and four different crops in Spain.

## ➤ Expected results

- Demonstration of the TWIN LAYER (TL) Prototype for treatment of 12 m<sup>3</sup>/day wastewater from the secondary treatment along the two years operation to produce a final effluent compliant with requirements for discharge in sensitive zones . (N=2 mg/L; P=15 mg/L).
- Uptake of 90-95% of nutrients (N and P) from wastewater (previous analysis showed N 38.33 mg/l, and P 5.07 mg/l in wastewater). Development of a concept for transformation of harvested TL microalgae into a marketable bio-fertiliser product.
- Formulation and production of marketable bio-fertilisers from microalgae, a total amount of 20,000 kg produced microalgae as input material. At least three new commercial products formulated from three bio-fertiliser lines : 300 L. for suspensions/foliar product; 100 kg. for powdered product; 50 kg. for micro-granulated product.



## ➤ Main locations

- Strain selection by isolation from test site will be performed at **University of COLOGNE labs**.
- Prototype design and construction by **BIOLOGICAL SOLUTIONS** at *Tres Cantos Tech Park* .
- Prototype will be located at “El Viso *Villaralto WWTP*”, (Córdoba), managed by **EMPROACSA**.
- Project coordination at **BIOMASA PENINSULAR** R&D&i at *Rabanales 21 Tech Park* and development of microalgae bio-fertilisers at “*Algodor Experimental Centre*” (Toledo).
- Agronomical trials at Spain, Portugal and Italy.
- Communication and dissemination by website, Stakeholders database of 2,000 registers in WATER and FERTILISERS fields, networking Plan with other R&D Projects, Layman's report, press releases, participation in conferences, scientific papers, Technical Workshops in Cologne and Córdoba, final Conference in Brussels and After LIFE Communication Plan.

