

Project Partners



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Greener-h2020



Contact

University of Burgos – ICCRAM

Calle Don Juan de Austria,
s/n, 09001
Burgos, Spain

e-mail: info@greener-h2020.eu

CE-BIOTEC-04-2018: InteGRated systems for Effective ENvironmEntal Remediation



Project Details

Start date: 1 March 2019

Duration: 4.5 years

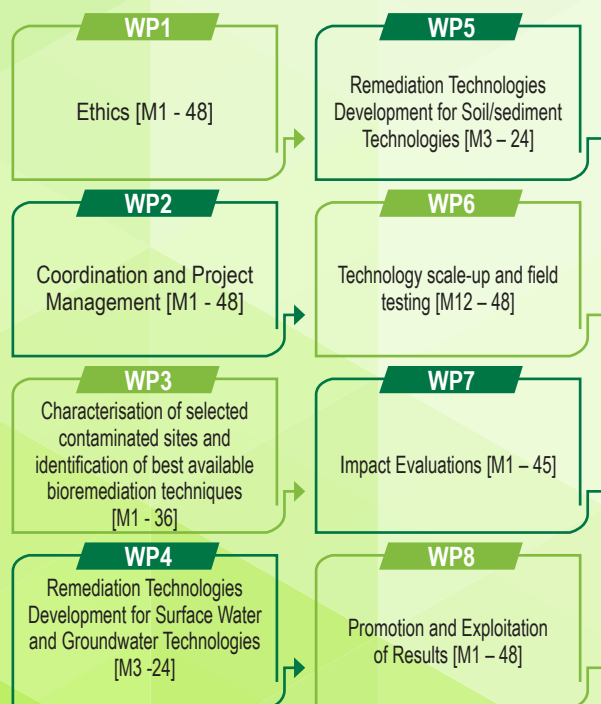
EU contribution:

EUR 4,964,168.25

Project webpage:

www.greener-h2020.eu

Workplan



Project Description

GREENER proposes the development of green, sustainable, efficient, and low-cost solutions for soil/sediment and water bioremediation, by integrating several remediation strategies with innovative bio-electrochemical technologies. The project focuses on accelerating the remediation time of a range of organic and inorganic pollutants of high concern, while producing end-products of interests, such as bioelectricity and/or harmless metabolites of industrial interest. To achieve such an ambitious goal, organisms with high bioremediation ability will be identified and isolated, the influence of physico-chemical factors on the effectiveness of treatment will be evaluated and proof-of-concept experiments to define optimal integrated solutions at the lab-scale will be performed. Finally, a combination of the most promising technologies will be up-scaled and tested on field. Life cycle analyses will demonstrate the technical and economic feasibility of the solutions suggested.

Objectives

- OBJ 1** To map, select, characterise and assess different polluted waters and soils/ sediments
- OBJ 2** To asses & study the microbial consortia for water and soil bioremediation and isolation of best performing species
- OBJ 3** To develop, improve, optimise and evaluate the effectiveness and impact of technologies
- OBJ 4** To improve, optimise and demonstrate the effectiveness and impact of biological strategies for soil bioremediation
- OBJ 5** To demonstrate hybrid bioremediation systems for the treatment of contaminated water
- OBJ 6** To scale-up the optimum technologies developed for water and soil bioremediation
- OBJ 7** To scale-up the optimum technologies developed for water and soil bioremediation
- OBJ 8** To demonstrate, monitor and validate the performance of the different technologies
- OBJ 9** To define suitable business models for diversification, exploitable results and identify potential value chains
- OBJ 10** To demonstrate the safety & regulatory compliance, and to conduct environmental & economic sustainability assessments
- OBJ 11** To maximise the innovation impacts of the project for contributing to the uptake of the project results for growth & jobs

Technologies

GREENER will include technologies such as, biopile (soil/sediment), ecopile (soil/sediment), phycoremediation (water), phytoremediation (soil/sediment and water), novel technology for metal and recovery of nanoparticles (water), bio-electrochemical systems such as, MFCs, MECs, SMFCs (soil/sediment and/or water) and hybrid systems such as, PFC (soil/sediment) and CW-MFC (water), two demonstrators for the pilot activities in soil/sediment (ACC, SDAS) and water (TAUW, QUST).



IMPACT 1. REMEDIATION OF AT LEAST TWO TOXIC CONTAMINANTS

- removal of potentially toxic metals and metalloids
- total petroleum hydrocarbons (TPHs) & polycyclic aromatic hydrocarbons (PAHs)
- antibiotics
- pesticides
- azo dyes



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IMPACT 2. SCALING UP OF THE TECHNOLOGY FOR FIELD TESTING, INCLUDING AN ASSESSMENT OF THE RELATED ENVIRONMENTAL BENEFITS AND RISKS

- combination of bioremediation techniques
- 2 demonstrators
- BES
- technology risk assessments



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IMPACT 3. BENEFITS OVER STANDARD PHYSICO-CHEMICAL REMEDIATION APPROACHES

- no external chemical agents or sources of temperature
- technologies based on the use of microorganisms
- no disposal or removal of soil
- energy output through Bio-electrochemical systems



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OTHER IMPACTS

- establishment & deployment of cost-effective and viable bioprocesses
- hiring new staff/training staff
- improving the knowledge base & progress of the remediation sector
- creation of new companies



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