



LIFE-BIOREST - Bioremediation and revegetation to restore the public use of contaminated land

LIFE15 ENV/IT/000396

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Project description:

Background

Contamination by hazardous substances is one of the main causes of soil degradation and loss of terrestrial ecosystem services. In the European Union, there are 42 potentially contaminated sites and 5.7 contaminated sites per 10 000 inhabitants. Approximately 340 000 sites require remediation. So far, only 15% of known contaminated sites have been remediated.

The most common soil contaminants in Europe are heavy metals, mineral oils, polycyclic aromatic hydrocarbons (PAHs) and mixtures of benzene, toluene, ethylbenzene and xylene (BTEX). Mineral oils, PAHs and BTEX make up 45% of the inventory of contaminants in Europe. Contamination from these three categories is widespread in all EU countries, in particular in Belgium, Hungary, Italy, Lithuania and the Netherlands, and non-EU country Montenegro. Contamination is mainly linked to sites used for service stations and by the oil industry. Excavation of contaminated soils and disposal in landfills is currently the most common remediation technique.

Objectives

The LIFE-BIOREST project aims to provide a viable method that uses fungal and bacterial strains for the in situ bioremediation of contaminated sites. The approach will be used to bioremediate soil from a site at Fidenza in northern Italy, reducing the presence of contaminants to within threshold limits for residential and public use, while restoring the ecological functions of the site. The project will also assess the cost effectiveness and replicability of the remediation methods, and will demonstrate the feasibility of scaling up to industrial level the production of micro-organisms that are used for bioremediation.

The project will also produce bioremediation guidelines, enabling the transfer to other locations of the techniques used, and will promote awareness of microbiological remediation of contaminated sites.

LIFE-BIOREST is in line with the EU Soil Thematic Strategy, which, among other things, calls for research into, and development of, operational procedures and technologies for soil protection and restoration. It also has the potential to contribute to the EU Biodiversity Strategy for 2020 (COM (2011) 244 final), which includes a target related to the restoration of degraded ecosystems. In addition, it will contribute to the implementation of circular economy principles by using agricultural waste and by-products from biogas production to promote microbial action at contaminated sites.

Expected results: LIFE-BIOREST will:

- Establish a collection of bacterial and fungal strains that are able to degrade alkanes, PAHs and BTEX, in combination with use of organic by-products;
- Scale up to industrial level the production of micro-organisms for the treatment of polluted sites;
- Demonstrate bioremediation of about 400 cubic metres of soil from the Fidenza site;
- Produce guidelines on the use of micro-organisms for the remediation of contaminated land, enabling transfer of the approach to other sites polluted by petroleum-related hydrocarbons;
- Demonstrate a reduction in the concentration of soil pollutants to levels compatible with residential or public use;
- Re-establish vegetation on the treated soil, showing that it can be used for the cultivation of different plant species;
- Establish chemical, microbiological and eco-toxicological indicators of the quality of remediated soils.

Results

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Environmental issues addressed:

Themes

Land-use & Planning - Soil and landscape protection  
Risk management - Site rehabilitation - Decontamination

Keywords

resource conservation, contaminated soil, site rehabilitation, industrial pollution, contaminated area, soil decontamination

## Target EU Legislation

- Land & Soil
- COM(2006)231 - “Thematic Strategy for Soil Protection” (22.09.2006)

Natura 2000 sites

Not applicable

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## Beneficiaries:

Coordinator	Consorzio Italbiotec
Type of organisation	Mixt enterprise
Description	Consorzio Italbiotec (ITB) is a non-profit organisation. Research, Training and Business Development form the functional core of Italbiotec, which has been promoting the biotechnology sector through national and international collaborations among universities, research centres and private companies. The consortium is a private-public entity, comprising ten universities, the National Research Council and over 30 private industries active in green chemistry, agro-food and pharmaceuticals sector. Italbiotec has been appointed by the Lombardy Region to create the Lombardy Green Chemistry Cluster.
Partners	Agencia Estatal Consejo Superior de Investigaciones Científicas, Spain Università degli Studi di Torino, Italy Saat Grand-EST, France Università Cattolica del Sacro Cuore, Italy Agenzia Regionale per la Prevenzione, l'Ambiente e l'Energia dell'Emilia- Romagna, Italy Actygea Srl, Italy

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## Administrative data:

Project reference	LIFE15 ENV/IT/000396
Duration	01-JUL-2016 to 31-DEC -2019
Total budget	1,710,267.00 €

EU contribution	968,274.00 €
Project location	Emilia-Romagna(Italia)

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Read more:

Leaflet	Title: "LIFE BIOREST: Factsheet" (843 KB) Author: Ilaria Re (editor) Editor: Consorzio Italbiotec No of pages: 2
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Poster	Title: "LIFE BIOREST: Bioremediation and revegetation to restore the public use of contaminated land LIFE BIOREST" (644 KB) Author: Ilaria Re (editor) Editor: Consorzio Italbiotec No of pages: 1
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Project web site	<a href="#">Project's website</a>
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