LIFE No_Waste - MANAGEMENT OF BIOMASS ASH AND ORGANIC WASTE IN THE RECOVERY OF DEGRADED SOILS: A PILOT PROJECT SET IN PORTUGAL

LIFE14 ENV/PT/000369

Project description Environmental issues Beneficiaries Administrative data
Read more

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Project description:

Background

Mining operations are a cause of soil degradation. They are associated with a legacy of abandoned metalliferous mine wastes and acid mine drainage, which contributes to around 2% of soil contamination in Europe. There is therefore an urgent need for sustainable site re-development strategies and remediation technologies that are effective, both in decontaminating and in preserving soil functions, at affordable costs. Low-cost technologies for the recoveryof degraded mining areas increasingly use ash from combustion processes as a resource for the remediation of contaminated soils. A total of 175 degraded mining areas (including 114 metallic sulphide mines) were identified throughout Portugal. There is also between 150 000 and 200 000 tonnes of biomass ash generated annually in the country that is typically disposed of in landfills, which could be used to help recover degraded soils in former mining areas.

Objectives

The LIFE No_Waste project aims to evaluate, demonstrate and disseminate the sustainable use of ash (from forest biomass residues combustion) combined with organic waste materials (sludge from the pulp and paper industry or compost) to regenerate degraded soils from mining areas, in compliance with the EU Thematic Strategy for Soil Protection.

The project also aims to reduce the impact of wastes from the pulp and paper industry on the environment, while making better use of valuable resources according to the end-of-waste criteria, while also contributing to the mitigation of greenhouse gas (GHG) emissions. A pilot-scale application of soil additives, produced by the mixture of ash with organic waste materials, will demonstrate soil recovery in three degraded mining areas (on a total of 12 test plots of 100 m2 each) located within the Iberian Pyrite Belt in Portugal.

Expected results: Through the production, testing and application of soil additives, composed of ash from biomass combustion, paper mill sludge and/or organic compost, to regenerate degraded soils in mining areas in Portugal, the following specific results are expected:

- The neutralisation of soil acidity (increased pH from 2.5-3.5 to 5.5-6.5);
- A 300-400% increase in soil organic carbon stock;
- A 100-300% increase in the available pool of plant nutrients (Ca, Ma, Na and K);
- A 90-100% decrease in available pools of potentially toxic elements;
- Up to 100% reduction of soil erosion rates;
- A 40-70% increase in soil water-retaining capacity;
- Up to 80% increase in plant biomass production;
- Up to 100% increase in microbial biomass;
- Up to 100% increase in enzymatic activity; and
- Up to one tonne of CO2 sequestered per 40 tonnes of ash applied to soil.

Additional expected achievements of the project include:

- Up to 100% reduction in the consumption of other expensive soil ameliorants (e.g.fertilisers, lime);
- Up to 100% reduction in diffuse pollution from the mining areas (e.g. Cd, Zn, Cu and Pb);
- Supporting the circular economy and accomplishing end-of-waste criteria for biomass ash; and
- Contributing to the sustainability of important economic sectors in Portugal (i.e. pulp and paper industry, energy production, waste management and mining).

Results

Top

Environmental issues addressed:

Themes

Risk management - Site rehabilitation - Decontamination
Waste - Waste use

Keywords

biomass energy, ash

Target EU Legislation

- Waste
- Directive 1999/31 - Landfill of waste (26.04.1999)
- Land & Soil
- COM(2006)231 - “Thematic Strategy for Soil Protection” (22.09.2006)
- Waste
- Directive 2008/98 - Waste and repealing certain Directives (Waste Framework Directive) (19.11.200 ...

Natura 2000 sites

Not applicable

Top

Beneficiaries:

Coordinator	Universidade de Aveiro
Type of organisation	University
Description	The University of Aveiro (UA) is a public university created in 1973. It is located on the central coast of Portugal and currently has more than 15 600 students and 16 academic departments.
Partners	EDM(EDM - Empresa de Desenvolvimento Mineiro, S.A.), Portugal NVG(Navigator Company S.A.) Portugal BLC3(Association BLC3 - Platform for the Development of Central Inner Region), Portugal RAIZ(RAIZ - Instituto de Investigação da Floresta e Papel), Portugal IPBeja(Instituto Politécnico de Beja), Portugal

Top

Administrative data:

Project reference	LIFE14 ENV/PT/000369
Duration	01-JAN-2016 to 30-SEP -2020
Total budget	1,384,481.00 €
EU contribution	830,688.00 €

Project location	Norte(Portugal) Centro(Portugal) Lisboa e vale do Tejo(Portugal) Alentejo(Portugal) Algarve(Portugal) Açores(Portugal) Madeira(Portugal)

Top

Read more:

Project web site	Project's website

Top

Project description Environmental issues Beneficiaries Administrative data
Read more