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](#)

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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 recovery of 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

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Environmental issues addressed:

Natura 2000 sites

Not applicable

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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 Portucel(Portucel, 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

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Administrative data:

Project reference	LIFE14 ENV/PT/000369
Duration	01-JAN-2016 to 31-DEC -2019
Total budget	1,384,481.00 €
EU contribution	830,688.00 €
Project location	Norte,Centro,Lisboa e vale do Tejo,Alentejo,Algarve,Açores,Madeira

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LIFE SWSS - Smart Water Supply System

LIFE14 ENV/PT/000508

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Project description:

Background

Water Supply Systems (WSS) are large-scale systems that collect, store, treat and transport water over wide geographical areas to consumers. Safe and efficient operation is crucial for these systems. WSS can have major environmental impacts due to the substantial amounts of energy consumed, as well as through the emission of greenhouse gases (GHG) and water leakages. This means that saving water will necessarily save energy. Current control systems are designed to deliver water, not to provide water efficiently. Moreover, water network management still relies on the utilities' accumulated experience, rather than on efficiency technologies. Water utilities face a double challenge to simultaneously save water and energy. This is particularly relevant in the WSS sector, where energy is mostly generated from non-renewable sources.

Objectives

The LIFE SWSS project aims to demonstrate and disseminate an innovative management and decision-support platform for water supply systems (called a Smart Water Supply System: SWSS). The SWSS platform will be composed of five modules: Predictive, Hydraulic simulation, Assessment, Leakage, and Optimisation, which together will support the water companies in their efforts to improve energy efficiency and water efficiency. The SWSS modules are based on previous developments from consortium partners of the project, which will be integrated into one single platform. The project will be implemented on three

demonstration water supply systems (AdA, AdC and AdO) under real working conditions. In these three demonstration WSS, the objectives are to reduce energy consumption, GHG emissions and water leakage by implementing the SWSS platform and the reverse-pump for energy recovery (renewable energy) in gravity systems.

Expected results:

- Energy consumption: reduction of 15% in the energy consumption of each demonstration systems: 0.75 GWh in AdA; 0.45GWh in AdC; 1.35 GWh in AdO (2.6 GWh in total);
- CO2 emissions: reduction of 15% in CO2 emissions for each demonstration systems: 354 tonnes CO2 eq in AdA, 252 tonnes CO2 eq in AdC; 637 tonnes CO2 eq in AdO (1.243 tonnes CO2 eq in total); and
- Water losses: reduction in average water losses in the three supply systems from 2.6% to 1%.

Results

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Environmental issues addressed:

Natura 2000 sites

Not applicable

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Beneficiaries:

Coordinator	INSTITUTO DE SOLDADURA E QUALIDADE
Type of organisation	Public enterprise
Description	ISQ (Instituto de Soldadura e Qualidade) is a private organisation whose main goal is to promote the exchange of knowledge between scientific institutions and business sectors. ISQ offers technical inspection, training and consultancy services, supported by R&D activities in 21 internal accredited laboratories.
Partners	AdO(Aguas do Oeste, SA), Portugal HID(Hidromod Modelação e Engenharia, Lda), Portugal AdA(Águas do Algarve, S.A.), Portugal AdC(Aguas do Centro, SA), Portugal AdP(Águas de Portugal SGPS, SA), Portugal IST(Instituto Superior Técnico), Portugal

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Administrative data:

Project reference	LIFE14 ENV/PT/000508
Duration	01-SEP-2015 to 31-AUG -2018
Total budget	1,389,800.00 €
EU contribution	802,747.00 €
Project location	Norte,Centro,Lisboa e vale do Tejo,Alentejo,Algarve,Açores,Madeira

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LIFE Impetus - Improving current barriers for controlling pharmaceutical compounds in urban wastewater treatment plants

LIFE14 ENV/PT/000739

[Project description](#) [Environmental issues](#) [Beneficiaries](#) [Administrative data](#)

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Project description:

Background

Pharmaceutical compounds (PhCs) are emerging contaminants of environmental-health concern that, if not checked, could adversely affect drinking water sources and reuse projects, two key issues of sustainable water management.

To develop water reuse and ensure the preservation of drinking water supplies in Europe, it is thus important to eliminate these compounds during wastewater treatment. Wastewater treatment plants (WWTPs) are crucial barriers against PhCs, but many of these compounds are resistant to conventional treatments. In the logic of resource efficiency, cost-effective solutions based on existing infrastructure (many of them recently built) are essential, as new investments are limited in the near future due to economic constraints.

Objectives

LIFE Impetus aims to demonstrate measures for improving PhC removal in urban WWTPs with conventional activated sludge (CAS) treatment. As CAS is the most common biological process in urban WWTPs, the solutions may be easily transferred to wastewater treatment across Europe.

The project will carry out a three-year field test in two Portuguese CAS-WWTPs in water-stressed regions (Lisbon and Algarve). These will assess performance,

using benchmarking tools and chemical enhancement measures easily implemented in the current treatment lines. The project will thus provide, for several European wastewater quality scenarios, guidelines for reliable and sustainable improvement of PhC removal in conventional WWTPs with minimum energy consumption. New adsorbents from local vegetal wastes (carob and cork) and biopolymer coagulants will be compared with commercial products.

A complementary objective is to produce valuable knowledge for water resource protection from PhCs and associated environmental policy. This includes PhC occurrence and concentration, control in WWTPs, bacterial antibiotic resistance and bioaccumulation in clams, a key product in many local economies in Algarve and elsewhere in Europe.

Expected results:

- A low-cost investment (CAPEX) and easy-to-implement solution for improving PhC control in conventional wastewater treatment, while keeping operating costs (OPEX) to a minimum and maximising recovery of resources and energy efficiency;
- Data on occurrence of PhCs in urban wastewaters, which could be used in decision-support systems, such as risk assessment, and future EU policy and legislation on PhC limits in urban wastewater;
- Innovation in methods/practices for improved PhCs control in two CAS aeration regimes (two WWTPs) – Operating strategies identified using benchmarking tools;
- Good performance indices, covering technical and economic aspects of treated wastewater quality, operating conditions (incl. energy efficiency) and removal efficiencies;
- Chemical enhancement strategies using two new eco-friendly adsorbents (from local wastes) and two natural coagulants;
- Development and validation of a procedure for PhC analysis in biological samples (clams);
- Analytical monitoring of PhC accumulation in clams (three campaigns and 150 samples);
- PhC analytical monitoring capacity-building of the consortium and the water sector (around 1000 samples analysed for 24 PhCs during a three-year period); and
- Cost-benefit analysis using innovative integrated approach based on four pillars: engineering (operating data from two WWTPs); environmental/economic impact (assessing the bioaccumulation of PhCs in clams, biomarkers and a key resource in the Algarve); health-related data (quantification of multidrug resistant bacteria and antibiotic resistance genes, a major concern in pharmaceuticals); and social indicators and stakeholders' attitudes towards PhC impact on environmental health, drinking water sources and water reuse projects (intangible costs and benefits).

Results

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Environmental issues addressed:

Natura 2000 sites

Not applicable

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Beneficiaries:

Coordinator	Laboratório Nacional de Engenharia Civil, I.P.
Type of organisation	Research institution
Description	The Laboratório Nacional de Engenharia Civil – LNEC (National Laboratory for Civil Engineering) is a state-owned research and development institution founded in 1946. LNEC's main goals are to carry out innovative R&D and to contribute to best practice in civil engineering.
Partners	FFUL(Faculdade de Farmácia da Universidade de Lisboa), Portugal EHS(EHS – Environment and Regional Development Consulting, Lda), Portugal EPAL(Empresa Portuguesa das Águas Livres, S.A.), Portugal AdA(Águas do Algarve, S.A.), Portugal Simtejo(Saneamento Integrado dos Municípios do Tejo e Trancão, S.A.), Portugal FCUL(Faculdade de Ciências da Universidade de Lisboa), Portugal UALG(Universidade do Algarve), Portugal

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Administrative data:

Project reference	LIFE14 ENV/PT/000739
Duration	01-JAN-2016 to 30-JUN -2019
Total budget	1,492,452.00 €
EU contribution	855,589.00 €
Project location	Norte,Centro,Lisboa e vale do Tejo,Alentejo,Algarve,Açores,Madeira

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Project description Environmental issues Beneficiaries Administrative data
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FLAW4LIFE - Spreading ugLy Fruit Against food Waste

LIFE14 ENV/PT/000817

Project description Environmental issues Beneficiaries Administrative data

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Project description:

Background

In Portugal, a million tonnes of food are wasted every year, amounting to 17% of the total food production. The reasons are numerous and occur along all the food supply chain: intensive production models, inadequate storage and transportation, expiration dates that are too tight and sale discounts that encourage consumers to buy unreasonably. Another reason is the preference for fruit and vegetables that are ‘perfect’ in terms of shape, colour and size, which ultimately restricts food consumption. This food waste has also environmental implications, since it involves the unnecessary use of resources in their production (soil, energy and water).

Objectives

The FLAW4LIFE project aims to change food consumption habits and create an alternative market for ‘ugly’ (or less than perfect-looking) fruit and vegetables. It aims to bring about the equal marketing of all quality fruit and vegetables regardless of their size, colour and shape. The project will achieve this goal by replicating nationally an innovative methodology (called Fruta Feia or Ugly Fruit), which has already been tested in Lisbon.

Fruta Feia's methodology consists of buying weekly from local producers the small, big or misshaped products that they cannot sell in the regular market and the selling these products to Fruta Feia’s associated consumers, who pick them up at the end of the day at fixed delivery points. The project will increase the

number of delivery points in Portugal to 10, thus avoiding 460 tonnes of waste annually.

During the first phase of the project implementation, the pilot project will be optimised and a business plan drawn up. Based on the results and lesson learned in the pilot project, eight new delivery points will be set up. With the support of local authorities and target groups, a nationwide network of farmers, local coordinators and consumers will be established.

Furthermore, the FLAW4LIFE project will established the resources required to foster an international network of associations and other entities involved in food waste management. It will provide support to associations, transferring the know-how and the comprehensive results in Portugal. A best practices handbook will be published.

Expected results:

- A reduction of food wastage: 10 tonnes/week and 460 tonnes/year;
- An increase in efficiency of farms due to better use of production resources (energy, water and soil): evaluation of energy use and water saving of around 181 000 m3 per year;
- A reduction of GHG emissions from food decomposition: 878.65 tonne CO2 eq. avoided/year;
- An increase in the number of delivery points, revitalizing local associations: 10 delivery points throughout the country;
- An increase in the involved farmers' productivity: 320 farmers accounting for around €161 000 per year;
- An increase of consumers of quality fruit and vegetables at a reduced price: 2 000 ugly fruit consumers involved;
- An increase of local coordinators, creating eight new jobs throughout the country;
- An increase in number of volunteers, capitalising on the feeling of belonging to the project: 160 volunteers involved per year; and
- Awareness of locals including school children of food wastage and consumption patterns.

Results

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Environmental issues addressed:

Natura 2000 sites

Not applicable

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Beneficiaries:

Coordinator	Fruta Feia CRL
Type of organisation	SME Small and medium sized enterprise
Description	FRUTA FEIA is a non-profit consumer cooperative that was established in 2013 to reduce food waste due to its appearance. It directly channels rejected fruits and to consumers. It has around 450 associated consumers (with more than 2 100 on the waiting list) and 32 partner farmers.
Partners	CML(Câmara Municipal de Lisboa), Portugal IST(Instituto Superior Técnico), Portugal CML(Câmara Municipal de Lisboa), Portugal IST(Instituto Superior Técnico), Portugal

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Administrative data:

Project reference	LIFE14 ENV/PT/000817
Duration	14-SEP-2015 to 13-SEP -2018
Total budget	574,396.00 €
EU contribution	320,600.00 €
Project location	Norte,Centro,Lisboa e vale do Tejo,Alentejo,Algarve,Açores,Madeira

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LIFE Rupis - Egyptian Vulture and Bonelli's Eagle Conservation in Douro/Duero Canyon

LIFE14 NAT/PT/000855

[Project description](#) [Environmental issues](#) [Beneficiaries](#) [Administrative data](#)

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Project description:

Background

Douro Internacional e Vale do Águeda SPA and Arribes del Duero SPA form one of the main areas for Egyptian vulture (*Neophron percnopterus*), Bonelli´s eagle (*Aquila fasciata*) and red kite (*Milvus milvus*) in the Iberian Peninsula. For the Egyptian vulture, the local population represents 10% of the total population of the peninsula. For Portugal, the area is the last stronghold of the Egyptian vulture and the red kite in the country.

The populations of all these birds of prey are declining nationally and in the wider EU. In the project area/SPAs these populations are still high, though breeding rates have declined and adult mortality rates increased as a result of poor habitat quality, disturbance and persecution.

Populations of Bonelli's eagle are stable in both SPAs with 13 breeding pairs since 2006, but the number of flying chicks fell from eight in 2006 to just four in 2013. As for the Egyptian vulture, the population in both SPAs decreased from 157 breeding pairs in 2006 to 116 in 2013, a 35% decline.

Objectives

The LIFE Rupis project aims to:

- Strengthen the populations of Egyptian vulture and Bonelli's eagle in Douro Internacional valley, through improved breeding success and reduction of

mortality;
- Improve the reproductive rate for both species (the target is at least one flying chick per active nest per year for both species);
- Reduce nest disturbance for these species with the aim of eliminating persecution of all breeding pairs in the project area;
- Increase food availability, particularly during breeding season;
- Reduce adult mortality for both species;
- Improve the habitat quality through better management of farming and grazing practices; and
- Better knowledge and dissemination of best practices for wildlife conservation.

Expected results:
- Improvement of breeding productivity of Egyptian vulture and Bonelli's eagle, compared with baseline (2006-2013) data;
- Increased red partridge and European rabbit abundance compared with 2015 baseline through better habitat and game management in at least six Bonelli's eagle territories;
- Increased pigeon abundance, compared with 2015 baseline, through the recovery and reactivation of traditional pigeon houses in eight Bonelli's eagle territories;
- Establishment of temporary local feeding stations for small scavengers, functioning within the EU and national sanitary regulations, serving at least 50 territories of Egyptian vulture;
- Surveys of all vulnerable nests and their protection during critical periods;
- Every individual of the target species that is found injured sent to recovery centres, which are equipped to treat these species and to deal with suspected poisonings;
- Two operative human-canine brigades to detect and act against illegal use of poison in the field. More than 300 monitoring actions to detect poison in the field performed per year in the project area;
- At least 50% of all suspected cases of illegal poisoning in the project area are adequately investigated and documented, and at least one case followed through a criminal process;
- Data on the prevalence of heavy metals and veterinary drugs on scavenging raptors available for future conservation planning;
- At least 120 electric pylons retrofitted as a mitigating measure against bird electrocution;
- Pilot habitat management covering at least 120 ha through traditional livestock practices and results disseminated;
- At least 15 land owners or other land managers are members of the poison-free network;
- Two international workshops on bird of prey conservation issues held;
- Two 'Bird of the Year' campaigns carried out;
- 5 000 people reached through different communication means in whole project; and
- Area of SPA enlarged to secure more effective protection.

Results

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Environmental issues addressed:

Target species

Aegypius monachus Hieraaetus fasciatus Milvus milvus Neophron percnopterus

Natura 2000 sites

SPA	PTZPE0038	Douro Internacional e Vale do Águeda
SCI	ES0000118	ARRIBES DEL DUERO
SCI	PTCON0022	Douro Internacional
SCI	ES4150096	ARRIBES DEL DUERO

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Beneficiaries:

Coordinator	Sociedade Portuguesa para o Estudo das Aves
Type of organisation	NGO-Foundation
Description	Sociedade Portuguesa para o Estudo das Aves (SPEA) is a non-profit environmental NGO that is focused on the study and conservation of birds and their habitats in Portugal through the promotion of sustainable development. SPEA has been BirdLife International's partner in Portugal since 1999. This cooperation reinforces SPEA's conservation work and allows it to engage in international activities.
Partners	Palombar(Palombar, Associação da Conservação da Natureza e do Património Rural), Portugal FPN Cyl(Fundación Patrimonio Natural de Castila y León), Spain JCyL(JUNTA DE CASTILLA Y LEON), Spain ATN(Transumância e Natureza - Associação), Portugal GNR(Guarda Nacional Republicana (GNR)), Portugal ICNF(Instituto da Conservação da Natureza e das Florestas), Portugal VCF(Stichting The Vulture Conservation Foundation), Netherlands EDP-D(EDP Distribuição – Energia, S.A), Portugal

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Administrative data:

Project reference	LIFE14 NAT/PT/000855
Duration	16-JUL-2015 to 15-JUL -2019
Total budget	3,578,924.00 €
EU contribution	2,672,481.00 €
Project location	Castilla-León,Norte,Centro

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LIFE LINES - Linear Infrastructure Networks with Ecological Solutions

LIFE14 NAT/PT/001081

Project description Environmental issues Beneficiaries Administrative data

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Project description:

Background

There is a good knowledge of the existing fauna and flora in the Portuguese region of Alentejo. However one of the main transport and energy corridors linking Portugal to Spain lies in this region. This puts significant pressure on the area's wildlife, as the mortality data for the linear infrastructure (roads and power lines) shows. Within this socioeconomic context, stakeholders and public and private bodies have actively participated with universities to solve the environmental problems caused by transport and energy networks. The situation for wildlife could be improved through a coordinated strategy, based on research done at the University of Évora in the field of functional and structural connectivity mapping, which takes into account the movements and habitat use/preferences of target fauna species.

Objectives

The main objectives of the LIFE LINES project are to evaluate and disseminate practices to mitigate the negative effects that transport and energy infrastructure have on wild fauna, and to simultaneously promote the creation of a demonstrative 'green Infrastructure' based on ecological corridors and stepping stones.

Running alongside grey infrastructure e.g. roads, railways and energy networks, the enhanced green infrastructure will improve connectivity and the conservation

of local and regional biodiversity. A green infrastructure strategy will be used, for the first time, as a decision-support tool for practical conservation aims.

Expected results: The LIFE LINES project will implement actions and test solutions to make roads, abandoned railways and power lines (medium and high voltage) more sustainable for wildlife, by managing this infrastructure within the 'green infrastructure' concept. Specifically, the project is expected to:

- Increase landscape connectivity in the study area and with surrounding areas, and reduce wildlife mortality caused by grey infrastructure;
- Create a network of corridors and micro-reserves in the vicinity of linear infrastructure, including road embankments and around utilities' pylons;
- Promote practices for the rapid detection and control of invasive alien plant species in grey infrastructure;
- Create a nursery and seed mixtures of native plants for use in habitat creation, recover of areas invaded by exotic flora, and create biodiverse flora communities within micro-reserves;
- Create a national wildlife mortality database that can be used as a common platform for all infrastructure operators and nature conservation institutions;
- Increase people's awareness of, and get their input on the problem of wildlife mortality from vehicle collisions, through the development of a mobile application (tablet and smartphone);
- Test the efficiency of new designs of landing deterrents mounted on pylons of medium and high voltage power lines; and
- Test the efficacy of various 'self-learning' machines/ systems for the identification of amphibian and bird roadkill.

Results

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Environmental issues addressed:

Natura 2000 sites

Not applicable

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Beneficiaries:

Coordinator	Universidade de Évora
Type of organisation	University

Description	The University of Évora (UE) is located in the Portuguese region of Alentejo. It offers 33 courses and 41 post-graduate degrees. Research and Development is organised in several areas through a network of 14 research units, with a common emphasis on sustainable development.
Partners	EGSP(EGSP - Energia e Sistemas de Potência Lda), Portugal MARCA(MARCA - Associação de Desenvolvimento Local), Portugal CME(Município de Évora), Portugal IP(Infraestruturas de Portugal, S.A.), Portugal FCUP(Universidade do Porto), Portugal CMMN(Município de Montemor-o-Novo), Portugal UA(Universidade de Aveiro), Portugal

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Administrative data:

Project reference	LIFE14 NAT/PT/001081
Duration	01-AUG-2015 to 31-JUL -2020
Total budget	5,540,485.00 €
EU contribution	3,324,303.00 €
Project location	Alentejo

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