



Environment Policy & Governance

LIFE PROJECTS 2012

LIFE Environment

Environment



LIFE+ Environment Policy & Governance 2012: Commission funds 146 innovation projects in 18 countries with €136.8 million

The European Commission has approved funding for 146 new environmental innovation projects in 18 countries under the LIFE+ Environment Policy & Governance programme 2012. These projects will demonstrate new methods and techniques for dealing with a wide diversity of Europe's environmental problems. The projects are led by 'beneficiaries', or project promoters, based in Austria, Belgium, Bulgaria, Cyprus, Finland, France, Greece, Italy, Luxembourg, Malta, the Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden and the United Kingdom. They represent a total investment of €298.5 million, of which the EU will provide some €136.8 million.

LIFE+ Environment Policy & Governance in 2012

The Environment Policy & Governance strand of LIFE+ supports pilot projects that contribute to the development of innovative policy ideas, technologies, methods and instruments. Of the 743 proposals received, the Commission selected 146 projects for funding from a wide range of public and private sector organisations. The winning projects, situated in 18 Member States, represent a total investment of €298.5 million, of which the EU will provide some €136.6 million.

Under this component, the Commission will contribute more than €34.5 million to 29 projects directly tackling climate change, with a total budget of €69.8 million. The selected projects, situated in Belgium, Bulgaria, Denmark, Spain, Finland, France, Italy, Luxembourg, Sweden and the United Kingdom, are highlighted in the annex to this press release. In addition, many other projects focusing on other issues will also have an indirect impact on greenhouse emissions.

Other important areas of focus include water, waste and natural resources, chemicals, the urban environment, soils and air quality.

Background

LIFE is the EU's financial instrument to support environment and nature conservation projects throughout the EU, and in certain non-EU countries. Since 1992,

LIFE has co-financed some 3 900 projects, contributing approximately €3.1 billion to the protection of the environment. LIFE+ is the European financial instrument for the environment with a total budget of €2 143 billion for the period 2007-2013. During this period, the Commission is launching one call for LIFE+ project proposals per year.

LIFE+ Environment Policy & Governance is one of three thematic components under the LIFE programme. The other two components, LIFE+ Nature & Biodiversity and LIFE+ Information & Communication, focus respectively on improving the conservation status of endangered species and habitats, and on disseminating information and raising the profile of environmental issues, or providing training and awareness-raising for the prevention of forest fires.

More information on each LIFE+ project is available at: <http://ec.europa.eu/environment/life/project/Projects/index.cfm>

Contact details for the relevant national authorities can be found at: <http://ec.europa.eu/environment/life/contact/national-contact/index.htm>

Index of Environment Policy & Governance projects selected in 2012

Location	Project number	Title of project
AUSTRIA	LIFE12 ENV/AT/000128 LIFE-URBANLAKE	Integrated Lake Management of the Urban Lake "Alte Donau"
BELGIUM	LIFE12 ENV/BE/000205 LIFE Polyphos Acid	Production of Polyphosphoric Acid using an innovative phosphoric acid wet process
	LIFE12 ENV/BE/000214 LIFE FLAT to FLAT	Demonstration of an innovative fine crushing method for glass and alternative cullet in flat glass production
	LIFE12 ENV/BG/000756 LIFE Eco-HeatOx	Demonstration & validation of a heat recovery packaged solution for decreasing oxy-glass factories' environmental impact
CYPRUS	LIFE12 ENV/CY/000276 LIFE+ SmartPV	Smart net metering for promotion and cost-efficient grid-integration of PV technology in Cyprus
	LIFE12 ENV/CY/000544 LIFE LIVE-WASTE	Sustainable management of livestock waste for the removal/recovery of nutrients
FINLAND	LIFE12 ENV/FI/000150 LIFEPeatLandUse	Quantification and valuation of ecosystem services to optimise sustainable re-use for low-productive drained peatlands
	LIFE12 ENV/FI/000409 LIFE MONIMET	Climate change indicators and vulnerability of boreal zone applying innovative observation and modelling techniques
	LIFE12 ENV/FI/000592 LIFE+ UPACMIC	Utilisation of by-products and alternative construction materials in new Mine Construction
	LIFE12 ENV/FI/000597 LIFE+ 2012 N-SINK	Reduction of waste water nitrogen load: demonstrations and modelling (N-SINK)
FRANCE	LIFE12 ENV/FR/000142 LIFE HEART	Improved HEAt Recovery in clay roof Tile and brick production
	LIFE12 ENV/FR/000316 Life+-PêcheAPiedeLoisir	Pilot experiments on sustainable and participatory management of recreational seafood hand harvesting
	LIFE12 ENV/FR/000479 LIFE-PHOSTER	PHOtovoltaic STEel Roof: ready to plug in BIPV roofing steel envelope based on green innovative technologies and processes
	LIFE12 ENV/FR/000480 LIFE AUTO	LIFE AUTO: Demonstration and validation of an innovative automatic fuel additives system for diesel fuel
	LIFE12 ENV/FR/000530 LIFE-PHYTOBARRE	An innovative process for the treatment of phytopharmaceutical effluent and new uses for farmers
	LIFE12 ENV/FR/000570 LIFE BiBAT	Development of a new generation Li-ion battery with low environmental impact by setting up a prototype line
	LIFE12 ENV/FR/000799 LIFE Carbon dairy	Carbon plan of French dairy production
	LIFE12 ENV/FR/000802 LIFE BIONOBO	Biological two-stage biogas treatment process
	LIFE12 ENV/FR/001113 LifeCiP (LCIP)	Life Cycle in Practice

Location	Project number	Title of project
FRANCE	LIFE12 ENV/FR/001125 LIFE + Urbanecy	Improvement of urban environment via an innovative and economically-viable logistic platform using green vehicles
GREECE	LIFE12 ENV/GR/000427 LIFE RECLAIM	Landfill mining pilot application for recovery of invaluable metals, materials, land and energy
	LIFE12 ENV/GR/000466 LIFE CONOPS	Development & demonstration of management plans against -the climate change enhanced- invasive mosquitoes in S. Europe
	LIFE12 ENV/GR/001040 CROME-LIFE	Cross-Mediterranean Environment and Health Network
	LIFE12 ENV/GR/001135 LIFE READ	REACH Database for Safety Data Sheets (SDSs) and Workplace Instruction Cards (WICs)
ITALY	LIFE12 ENV/IT/000120 LIFE BIOCLOC	BIOprocess ControlL through Online titrimetry to reduce Carbon footprint in wastewater treatment
	LIFE12 ENV/IT/000153 LIFE+ InBioWood	Increase Biodiversity through Wood Production
	LIFE12 ENV/IT/000154 LIFE PROSIL	Promoting the use of in silico methods in industry
	LIFE12 ENV/IT/000289 LIFE SMILE	Strategies for Marine Litter and Environmental prevention of sea pollution in coastal areas
	LIFE12 ENV/IT/000295 LIFE FIBERS	FIBERS INNOVATIVE BURNING AND REUSE BY SHS
	LIFE12 ENV/IT/000307 LIFE HPRS	High Pressure Resination System
	LIFE12 ENV/IT/000308 BioMethER LIFE+	Biomethane Emilia-Romagna Regional system
	LIFE12 ENV/IT/000336 Life After-Cu	Anti-infective environmental friendly molecules against plant pathogenic bacteria for reducing Cu
	LIFE12 ENV/IT/000352 Life BioNaD	Naturalised dyes replacing commercial colorants for environmentally friendly leather dyeing and water recycle
	LIFE12 ENV/IT/000356 LIFE RESAFE	Innovative fertiliser from urban waste, bio-char and farm residues as substitute of chemicals fertilisers
	LIFE12 ENV/IT/000374 Life Plastic Killer	Innovative plastic pollutants removal for efficient recycled wood panels production
	LIFE12 ENV/IT/000393 LIFE Prefer	PRoduct Environmental Footprint Enhanced by Regions
	LIFE12 ENV/IT/000404 LIFE+ _Climate changE-R	Reduction of greenhouse gases from agricultural systems of Emilia-Romagna
	LIFE12 ENV/IT/000411 LIFE EMaRES	Enhanced Material Recovery and Environmental Sustainability for Small Scale Waste Management Systems
	LIFE12 ENV/IT/000419 LIFE of water is man life	Minimise the water footprint of the impactful H ₂ O waste in the cutting cycle of natural stone blocks
	LIFE12 ENV/IT/000423 LIFE GLUELESS	Petrol based Glue and Energy consumption reduction in diapers production processes

Location	Project number	Title of project
ITALY	LIFE12 ENV/IT/000424 LIFE ZEF-tile	Zero Emission Firing strategies for ceramic tiles by oxy-fuel burners and CO ₂ sequestration with recycling of byproducts
	LIFE12 ENV/IT/000439 LIFE+GREENWOOLF	Green hydrolysis conversion of wool wastes into organic nitrogen fertilisers
	LIFE12 ENV/IT/000442 SEKRET Life	Sediment ElectroKinetic REmediation Technology for heavy metal pollution removal
	LIFE12 ENV/IT/000578 LIFE HelpSoil	Helping enhanced soil functions and adaptation to climate change by sustainable conservation agriculture techniques
	LIFE12 ENV/IT/000579 LIFE Enrich a poor waste	Original ennobling recycling process of GFRP waste to re-produce GFRP replacing energy-intensive construction elements
	LIFE12 ENV/IT/000600 LIFE BiMoP	Bio-inspired thermo/UV curable monomers and polymers
	LIFE12 ENV/IT/000611 LIFE+ -VIRGIN	Highly-efficient Valorisation of AHP waste through a novel combination of Autoclave and Gasification
	LIFE12 ENV/IT/000614 MAPEC_LIFE	Monitoring air pollution effects on children for supporting Public Health Policy
	LIFE12 ENV/IT/000633 LIFE EDESIA	Endocrine Disruptors in silico / in vitro Evaluation and Substitution for Industrial Applications
	LIFE12 ENV/IT/000652 LIFE CLEANSED	Innovative integrated methodology for the use of decontaminated river sediments in plant nursing and road building
	LIFE12 ENV/IT/000671 LIFE-OPTIMAL2012	OPTimised nutrients MAnagement from Livestock production in Alto Adige
	LIFE12 ENV/IT/000678 LIFE ReTSW-SINT	Recycling of thermal spray waste in sintered products
	LIFE12 ENV/IT/000712 LIFE+ GLEE	LIFE+ GLEE "Green Li-ion batteries through Electrode Electroless deposition"
	LIFE12 ENV/IT/000719 LIFE CarbOnFarm	Technologies to stabilise soil organic carbon and farm productivity, promote waste value and climate change mitigation
	LIFE12 ENV/IT/000736 LIFE GREEN SINKS	Realisation of green composite sinks substituting organic and mineral primary materials by recovered waste
	LIFE12 ENV/IT/000834 LIFE MED HISS	Mediterranean Health Interview Surveys Studies: long term exposure to air pollution and health and surveillance
LIFE12 ENV/IT/000904 LIFE FRELP	Full Recovery End-of-Life Photovoltaic	
LIFE12 ENV/IT/001020 LIFE PRIME GLASS	Innovative PRImary MEasures for reduction of NO _x emissions and Energy consumption by glass furnaces	
LIFE12 ENV/IT/001033 Wi-GIM LIFE	Wireless Sensor Network for Ground Instability Monitoring	

Location	Project number	Title of project
ITALY	LIFE12 ENV/IT/001054 LIFE + IMAGINE	Integrated coastal area Management Application implementing GMES, INspire and sEis data policies
	LIFE12 ENV/IT/001058 WEENMODELS life	WEENMODELS - Waste Electric and Electronic Equipment - New MODEL for Logistic Solutions
	LIFE12 ENV/IT/001095 LIFE SANITSER	Sanitaryware production: use of waste glass for saving energy and resources
LUXEMBOURG	LIFE12 NAT/LU/000360 LIFE GREEN EAF	CO ₂ emissions and energy consumption reduction of an Electric Arc Furnace through dynamic thermal balance monitoring
MALTA	LIFE12 ENV/MT/000732 LifeMedGreenRoof	Constructing two demonstration green roofs to illustrate the potential of meeting environmental and energy targets
POLAND	LIFE12 ENV/PL/000013 LIFE COGENERATION PL	Demo installation of electricity/heat COGENERATION with gasification of fuel based on municipal waste and sewage sludge
	LIFE12 ENV/PL/000056 LIFE-APIS/PL	Air Pollution and biometeorological forecast and Information System
PORTUGAL	LIFE12 ENV/PT/001154 LIFE HyMem	Tailoring hybrid membrane processes for sustainable drinking water production
SLOVAK REPUBLIC	LIFE12 ENV/SK/000094 Life for Krupina	Elimination of impacts of geological component of environment on health status of Krupina district population
SLOVENIA	LIFE12 ENV/SI/000443 LIFE RusaLCA	Nanoremediation of water from small waste water treatment plants and reuse of water and solid remains for local needs
	LIFE12 ENV/SI/000783 LIFE Stop CyanoBloom	Innovative technology for cyanobacterial bloom control
	LIFE12 ENV/SI/000969 LIFE ReSoil	Demonstration of innovative soil washing technology for removal of toxic metals from highly contaminated garden soil
SPAIN	LIFE12 ENV/ES/000072 LIFESURE	Self-sustaining Urban Roads: A way to improve Environmental performance of urban areas
	LIFE12 ENV/ES/000079 LIFE REUSING POSIDONIA	14 sustainable dwellings using local resources as Posidonia plants at the Social Housing Development in Formentera
	LIFE12 ENV/ES/000092 life-QUF	Quick urban forestation
	LIFE12 ENV/ES/000123 LIFE Sludge4Aggregates	Valorisation of Waste Water Treatment Plants and aggregates processing sludges for lightweight aggregates production
	LIFE12 ENV/ES/000124 LIFE BOHEALTH	Boosting Health Sector to reduce its environmental impact using an innovative decision-making process based on LCA/LCC
	LIFE12 ENV/ES/000138 LIFE STARS (+20)	Support Tourism And Reduction Strategy (+20): STARS (+20)
	LIFE12 ENV/ES/000148 LIFE Comforest	Identification, monitoring and sustainable management of communal forests in Extremadura

Location	Project number	Title of project
SPAIN	LIFE12 ENV/ES/000156 LIFE CLAYGLASS	Adaptation to climate change by the structural ceramics industry through the use of recycled glass as pastry
	LIFE12 ENV/ES/000178 LIFE nanoRISK	Best practices effectiveness, prevention and protection measures for control of risk posed by engineered nanomaterials
	LIFE12 ENV/ES/000184 LIFE WaterReuse	Improving water management efficiency at industries with organic load
	LIFE12 ENV/ES/000222 LIFE GREEN TIC	Reducing CO ₂ footprint of Information and Communication Technologies
	LIFE12 ENV/ES/000230 LIFE CERAM	Zero waste in ceramic tile manufacture
	LIFE12 ENV/ES/000232 LIFE REGEN FARMING	Regenerative agricultural practices: demonstration of an alternative sustainable management of agrarian soils
	LIFE12 ENV/ES/000243 LIFE SHOEBAT	Promotion of best available techniques in the European footwear and tanning sectors
	LIFE12 ENV/ES/000250 LIFE-ETAD	Ecological treatment of acid drainage
	LIFE12 ENV/ES/000265 LIFE ADNATUR	Demonstration of natural coagulant use advantages in physical and chemical treatments in industry and urban waste water
	LIFE12 ENV/ES/000280 LIFE MINOX-STREET	Monitoring and modelling NO _x removal efficiency of photocatalytic materials: A STRategy for urban air quality managEmEnT
	LIFE12 ENV/ES/000309 LIFE DYES4EVER	Demonstration of cyclodextrin techniques in treatment of waste water in textile industry to recover and reuse textile dyes
	LIFE12 ENV/ES/000315 LIFE CO2SHOE	Footwear Carbon Footprint
	LIFE12 ENV/ES/000326 i-NANOTOOL LIFE+	Development of an interactive tool for the implementation of environmental legislation in Nanoparticle manufacturers
	LIFE12 ENV/ES/000332 LIFE NECOVERY	Nutrient and Energy Recovery in Wastewater Treatment Plants by Up-concentration and Adsorption processes
	LIFE12 ENV/ES/000361 LIFE-REMPHOS	Implementation of a New Phosphate Removal Tertiary Treatment in WWTP
	LIFE12 ENV/ES/000426 LIFE RegaDIOX	Fixation of atmospheric CO ₂ and reduction of greenhouse emissions by sustainable management of irrigation agriculture
LIFE12 ENV/ES/000441 LIFE PHORWater	Integral Management Model for Phosphorus recovery and reuse from Urban Wastewater	
LIFE12 ENV/ES/000477 LIFE Lo2x	Supercritical water co-oxidation (SCWco) of urban sewage and wastes	
LIFE12 ENV/ES/000536 LIFE MEDACC	Demonstration and validation of innovative methodology for regional climate change adaptation in the Mediterranean area	

Location	Project number	Title of project
SPAIN	LIFE12 ENV/ES/000545 LIFE WIRE	Water Cycle Efficiency Improvement by Boosting Industrial Water Reuse
	LIFE12 ENV/ES/000557 LIFE RURAL SUPPLIES	Sustainable solutions for very small water supplies
	LIFE12 ENV/ES/000567 LIFE ZARAGOZA NATURAL	Creation, management and promotion of green infrastructure in Zaragoza
	LIFE12 ENV/ES/000568 LIFE MICROTAN	Recovery of tannery wastes for functional micro-encapsulated products
	LIFE12 ENV/ES/000590 LIFE SEED CAPITAL	Integral use of oil seed to reduce greenhouse gases emissions associated with farming
	LIFE12 ENV/ES/000598 LIFE ENVIP	New environmentally friendly forming technique of ceramic sanitary wares by isostatic pressing
	LIFE12 ENV/ES/000632 LIFE-OFREA	Improving Water Reuse at the coastal areas by an advanced desalination process
	LIFE12 ENV/ES/000638 LIFE GAIN	Slag layers in railway foundations
	LIFE12 ENV/ES/000647 LIFE+Farms for the future	Farms for the future: Innovation for sustainable manure management from farm to soil
	LIFE12 ENV/ES/000651 LIFE+ InSiTrate	In-situ treatment technology for drinking water production from nitrate-polluted groundwater
	LIFE12 ENV/ES/000667 LIFE_ECO-TEXNANO	New tool to improve risk assessment and promote the safe use of nanomaterials in the textile finishing industry
	LIFE12 ENV/ES/000684 LIFE-PURIWAT	New demonstrative pilot plant for the purification of waste water with oils, fats and hydrocarbons
	LIFE12 ENV/ES/000685 LIFE ALBUFERA	Integrated management of three artificial wetlands in compliance with the Water Framework, Birds and Nitrates Directives
	LIFE12 ENV/ES/000686 LIFE HUELLAS	LCA, environmental footprints and intelligent analysis for the rail infrastructure construction sector
	LIFE12 ENV/ES/000687 LIFE SANePLAN	Integrated Planning and Sustainable Management of Sanitation Infrastructures through precision technology
	LIFE12 ENV/ES/000689 LIFE MIX_FERTILIZER	Valorisation of the digestate from pig manure as new fertilisers with organic/mineral base and gradual release
	LIFE12 ENV/ES/000695 LifeHyGENet	Hydraulic co-generation system in water abduction and distribution network
	LIFE12 ENV/ES/000727 LIFE REVA-WASTE	Demonstration of an integral and sustainable system for multi-waste recycling and valorisation
	LIFE12 ENV/ES/000729 LIFE DIOXDETECTOR	Fast Direct Atmospheric Dioxin Detection
	LIFE12 ENV/ES/000749 LIFE EQUINOX	Surface Treatment for Asphalt pavements to Nitrogen oxides removal in Urban Environments
LIFE12 ENV/ES/000754 LIFE COLRECEPS	Collection and recycling of expanded polystyrene (EPS) in the urban zone of Valladolid	

Location	Project number	Title of project
SPAIN	LIFE12 ENV/ES/000761 DISCOVERED LIFE	Lab to field soil remediation demonstration project: New ISCO application to DNAPL multicomponent environmental problem
	LIFE12 ENV/ES/000787 LIFEZEROSTORE	Supermarket retrofit for zero energy consumption
	LIFE12 ENV/ES/000814 LIFE BIOREG	Field and laboratory methods for the environmental evaluation of biocides within the European regulatory framework
	LIFE12 ENV/ES/000901 LIFE+ ZELDA	Zero Liquid Discharge desalination: brine treatment based on electrodialysis metathesis and valuable compound recovery
	LIFE12 ENV/ES/000902 LIFE Zero Residues	LIFE Zero Residues: towards a sustainable production and supply chain for stone fruit
	LIFE12 ENV/ES/000913 LIFE Eucalyptus Energy	Eucalyptus Integrated Wood Processing Project
	LIFE12 ENV/ES/000919 HUERTAS LIFE KMO	Environmental recovery of peri-urban spaces through actions in the ecosystem and organic agriculture. Vegetation gardens LIFEKMO
	LIFE12 ENV/ES/001070 LIFE ECO-DHYBAT	Demonstration of hygienic eco-design of food processing equipment as Best Available Technique
	LIFE12 ENV/ES/001140 LIFE SEGURA RIVERLINK	RIVERLINK
	LIFE12 ENV/ES/001163 VISIONTECH4LIFE	Multispectral visual monitoring of the impact of civil engineering works on the environment
LIFE12 ENV/ES/001173 LIFE_OPERE	Efficient Management of Energy Networks	
SWEDEN	LIFE12 ENV/SE/000292 ReCOOL for LIFE+	ReCOOL - Reuse of Anti-Freeze/COOLants through Innovative Recycling Technology for LIFE+
	LIFE12 ENV/SE/000359 LIFE SludgeisBiofuel	Dryer for energy recovery from sewage sludge and manure
	LIFE12 ENV/SE/000529 Etanolix 2.0 for LIFE+	Etanolix 2.0: Demonstrating Innovative Method for converting Industrial Waste to Ethanol in oil refinery for LIFE+
	LIFE12 ENV/SE/000683 LIFE BIOGAS XPOSE	LIFE BIOGAS XPOSE - Maximized biogas potential from resource innovation in the Biogas Öst region
	LIFE12 ENV/SE/000800 SOLMACC Life	Strategies for Organic- and Low-input-farming to Mitigate and Adapt to Climate Change
THE NETHERLANDS	LIFE12 ENV/NL/000269 LIFE ClosedLoopCarpet	Demonstration of separation and closed loop recycling of carpet waste into polymers for reuse in carpet production
	LIFE12 ENV/NL/000718 Life_Green_plasma	Green plasma process technology for manufacturing of flexible electronics
	LIFE12 ENV/NL/000739 Life+ LE2AP	Low Emission Asphalt Pavement
	LIFE12 ENV/NL/000792 LIFE ReWaCo	Reversed Waste Collection

Location	Project number	Title of project
THE NETHERLANDS	LIFE12 ENV/NL/000833 ChildProtect-Life	ChildProtect-Life – Protecting Children’s Health from Endocrine Disrupting Chemicals
	LIFE12 ENV/NL/000980 SRNEXT_4_LIFE	Demonstration of the next phase in shredder residue recycling: separating black plastics and minerals
UNITED KINGDOM	LIFE12 ENV/UK/000473 LIFENaturEtrade	NaturEtrade: creating a marketplace for ecosystem services
	LIFE12 ENV/UK/000542 LIFE CoaLESCe	CollabOrAtive Local Engagement Strategies for our Climate
	LIFE12 ENV/UK/000608 LIFE REBus	Developing Resource Efficient Business Models
	LIFE12 ENV/UK/000731 LIFE ObservaTREE	LIFE ObservaTREE - an integrated early warning system for tree pests and diseases using citizen science
	LIFE12 ENV/UK/000966 LIFE+ CEMs	Circular Economy Metrics
	LIFE12 ENV/UK/001133 LIFE Housing Landscapes	Climate-proofing Social Housing Landscapes

Integrated Lake Management of the Urban Lake “Alte Donau”

Project background

The “Alte Donau”, the former riverbed of the Danube in Vienna, Austria, extends to 160 ha and is one of Europe’s largest urban lakes. It is fully embedded in the city landscape and used intensively for recreation and anthropogenic purposes. These activities exert increasing pressure on the environmental quality of the water body, especially as the city’s population continues to grow at a rapid rate. The number of swimmers using the lake has increased by 97% since 1988, and the city’s planners forecast that some 8 000 new residents will move into the lakeside area over the next few years.

Due to this increased stress (and also including uncertainties associated with climate change), there is a need to introduce new urban management measures that will help to safeguard the quality of this water body for the long-term.

Project objectives

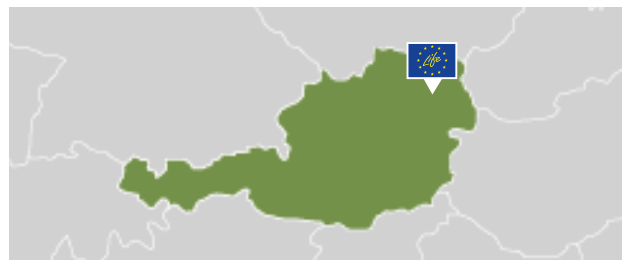
The LIFE-URBANLAKE project intends to define strategies to reduce the vulnerability of the “Alte Donau” to the effects of climate change and anthropogenic pressures. The strategies will focus on maintaining the lake’s current good environmental status and bathing water quality. Integrated lake management and risk management systems will be deployed as part of the strategies and these will comprise innovative methods for holistic governance of the water resource, as well as its ecological and socio-economic environment.

Support to facilitate the putting in place of highly competent staff, and rapid, cost-effective counter-measures for tackling potential disruptions are envisaged. A key goal of the project will also be to improve stakeholder support for and participation in the lake’s management.

Specific objectives include:

1. Implementation and demonstration of integrated lake management in an intensively used urban environment, in the context of the city’s governance practices.
2. Reduction of the vulnerability of the “Alte Donau” to climate change impacts and other anthropogenic pressures.
3. Maintaining and ensuring good ecological status (in relation to the Water Framework Directive) and good quality bathing water (Bathing Water Directive) through the implementation of innovative technologies and methods, adapted to the special conditions of the “Alte Donau”’s urban environment.

LIFE12 ENV/AT/000128
LIFE-URBANLAKE



Beneficiary:

Type of beneficiary

Local authority

Name of beneficiary

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Name of contact person

Gerhard BLÖSCHL

Duration of project:

48 months (01/07/2013 – 30/06/2017)

Total budget in euro:

3,616,050.00

EC contribution in euro with %:

1,637,900.00 (50.00%)

Themes: Climate change – Energy: Adaptation to climate change / Services and Trade: Sports and Recreation activities

4. Achieving and maintaining a stable aquatic environment in an intensively-used urban environment through sustainable management procedures.
5. Maintaining and improving the socio-economical benefits for the city population and other stakeholders.

Expected results

Anticipated outcomes include the accelerated implementation of integrated approaches to the lake’s management, to reduce risks and achieve good ecological status and good quality bathing water. The latter will be based on achieving targets for phosphorus content (15 – 25 µg/l), pH (8.5-9.2), macrophytes growth (increase from 75% to 80-85%, with >300 tonnes dry mass) and diversity (e.g. Characeae from 1-2% to > 10%). Benefits in terms of eutrophication, fish populations and shore restoration are also expected.

Production of Polyphosphoric Acid using an innovative phosphoric acid wet process

Project background

The chemical and petrochemical sector is responsible for more than 30% of total industrial energy use worldwide (including feedstocks), and is by far the greatest industrial energy user. The phosphate industry is no exception. There is growing demand for phosphates, and especially polyphosphoric acid, from several sectors - pharmaceuticals, cosmetics, petrochemicals, road construction (asphalt), textiles, water treatment, fertilisers and others. In 2009, worldwide phosphate production reached more than 50 kilotonnes (kT), with an annual growth rate of 4.2%. More than 60% (31.91 kT) of this production is currently achieved via a thermal process (by applying heat), which has a major environmental impact and is very energy consuming.

Project objectives

The project will establish a pilot process for the production of highly purified polyphosphoric acid (85% P_2O_5) using an innovative wet process, which is less polluting and more energy-efficient but more complex than the thermal process, meaning it is not widely used. The wet process consists of transforming phosphate rock into a first intermediate product, the "raw acid" (60% P_2O_5), which is then made into "purified acid" (63% P_2O_5), which can be finally converted into the purified polyphosphoric acid (85% P_2O_5).

The project addresses this last step in the production process. A pilot-scale facility will be built at the beneficiary's premises, composed of a flame chamber (the first sub-system and also the main innovative element), a second critical sub-system (the mass and energy recuperator), and finally the gas treatment equipment. This new patented process should substantially reduce energy consumption and greenhouse gas emissions, and should also reduce waste.

Expected results

The project expects to achieve:

1. Reduction of the carbon footprint, through:
 - Reduced energy consumption: Compared to the thermal process, the project's pilot facility is expected, per tonne of P_2O_5 as polyphosphoric acid, to reduce energy consumption from 11.82 megawatt hours (Mwh) to 5.47 Mwh (a 54% reduction), and to reduce CO_2 emissions from 2.97 tonnes to 1.37 tonnes. Taking into account the specific energy production system in place at the beneficiary's premises, the overall CO_2 reduction should be 90%; and

LIFE12 ENV/BE/000205

LIFE Polyphos Acid



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Name of contact person

Carl SZÖCS

Duration of project:

33 months (01/07/2013 – 31/03/2016)

Total budget in euro:

2,478,217.00

EC contribution in euro with %:

1,239,108.00 (50.00%)

Themes: Environmental management: Cleaner technologies / Industry-Production: Chemicals

- Reduction of the materials necessary to set-up the process: For the same annual production, the beneficiary's system is estimated to be 80% smaller in size, and 50% less in mass than current thermal systems. In addition, the innovative coating of the flame chamber will significantly increase the lifetime of the equipment. As such, the energy and material required to put in place the system is reduced.
2. Reduction of waste and enhancement of the re-use of residual materials:
 - The thermal process produces 1.75 tonnes of slag per tonne of polyphosphoric acid. By comparison, the wet process is expected to produce 0.75 tonnes of gypsum, equivalent to a 57% reduction in waste generated by the production of polyphosphoric acid.

Demonstration of an innovative fine crushing method for glass and alternative cullet in flat glass production

Project background

Glass is a key element for many industries. In 2006, the world market for flat glass was estimated at around 42 million tonnes. Growth in the demand for flat glass has generally outpaced real GDP growth for the past 20 years. The production of glass, however, requires high levels of energy and raw materials, and leads to the emission of various pollutants. The current energy necessary to produce one tonne of glass amounts to 6-7 GJ whereas the theoretical minimum energy level required would be 2-3 GJ – the energy necessary for the materials needed in the glass composition to melt.

Furthermore, the fraction of cullet – or glass waste – used for recycling accounts only for 30% of the total production. For quality control reasons, flat glass producers reuse only internal cullet (production losses and glass with colour faults) and some industrial cullet (from subsidiaries and recyclers). In addition, glass production entails the emission of atmospheric pollutants (e.g. CO₂, SO_x, NO_x) and the use of large quantities of water and raw materials (sand, minerals and metals).

Project objectives

This project aims to develop and validate an innovative method for recycling and up-cycling glass and other waste materials in the production of flat glass. This aim will be achieved through an innovative grinding technology that allows the content of recycled materials of the final flat glass to be raised to 25%, and the use of up to 55% of glass cullet.

The recycled materials introduced in this project will come from sources that couldn't previously be used by the glass industry (e.g. glass fibre) because of their negative impact on glass quality and the production process. The innovative processing technique will also make it possible to use cullet that contains 1 000 times more ceramics, stone, and porcelain (CSP). The project will cover the entire glass lifecycle, thereby not only demonstrating the technique, but also defining its infrastructure. Besides a significant reduction of the use of raw materials, it will also lower energy consumption by 5% and CO₂ emissions by 12%.

Expected results

The project expects to increase to 25% the reuse (recycling/up-cycling) of raw materials (cullet and industrial waste, such as fibre glass) in the production of flat glass.

LIFE12 ENV/BE/000214
LIFE FLAT to FLAT



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

AGC Glass Europe SA

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Charles WAVRIN

Duration of project:

54 months (01/07/2013 – 31/12/2017)

Total budget in euro:

10,477,106.00

EC contribution in euro with %:

4,433,050.00 (49.94%)

Themes: Environmental management: Cleaner technologies / Industry-Production: Non-metallic minerals

It will build a pilot installation capable of treating 50 000 tonnes/day of recycled materials to reduce energy requirements. For a typical float line with a yield of 600 tonne/day, this will lead to savings in raw materials (25%); CO₂ (12%); and energy (5%).

For one float line, the following savings could be achieved:

- 50 000 tonnes/yr of raw material;
- 15 000 tonnes/yr of CO₂; and
- 20 600 MWh of energy (calculated using a nominal energy use of 6.75 GJ/tonnes of glass).

Demonstration & validation of a heat recovery packaged solution for decreasing oxy-glass factories' environmental impact

Project background

Glass is a key element to many industries and in Western Europe, the average annual consumption of glass is estimated to be 18 kg per person. The manufacturing processes of mineral products such as glass, lime, and cement are responsible for 50% of anthropogenic greenhouse gas (GHG) emissions, more than the chemical and metal industries. Glass production also requires large amounts of energy and leads to the emission of pollutants (SO_x and NO_x) that can cause acid rain. The European Commission has set targets to be reached by 2020 in order to limit the negative impact of pollutants (COM (2005) 446 final). To achieve this objective, by 2020 SO_2 and NO_x emissions must decrease by 82% and 60% respectively from 2000 levels.

Some steps have been taken by the glass industry in order to address these challenges. A good example of this is the LIFE HotOxyGlass project, which developed a new hot oxy-combustion technique that significantly improves the environmental performance of glass production in terms of energy consumption and GHG emissions. This technology is currently limited to large furnaces producing flat glass, and is not suitable for small and medium furnaces (as the used in tableware glass manufacturing) because of the poor return on investment.

Project objectives

The LIFE Eco-HeatOx project will set-up and implement a pilot-scale industrial furnace for tableware glass using only hot oxygen and natural gas, to remove the oil portion used by standard industry furnaces.

The project will focus on tableware glass and this technology, if validated, can be transferred to all small and medium-sized furnaces regardless of the sector as long as the furnace operates above 700°C (as do the majority of active furnaces in Europe).

The process will require less equipment than existing technologies thus allowing it to be more broadly applied to small and medium-sized glass furnaces. As well as reducing CO_2 and NO_x emissions, it will also cut natural gas and oxygen consumption by preheating those reactants to 450°C using waste heat from furnaces.

By saving energy, the technology should reduce the impact of energy-price fluctuations on glass producers. It is expected that reduced additives consumption and over-

LIFE12 ENV/BG/000756

LIFE Eco-HeatOx



Beneficiary:

Type of beneficiary

International enterprise

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Suleyman KOC

Duration of project:

42 months (01/07/2013 – 31/12/2016)

Total budget in euro:

4,329,349.00

EC contribution in euro with %:

1,689,986.00 (50.00%)

Themes: Climate change – Energy: Energy saving / Industry-Production-Non-metallic minerals

all financial viability will help the transferability of the technology.

The project team will build a pilot plant to demonstrate and validate the technical feasibility in an industrial context. Benefits will be assessed and widely disseminated to owners of small and medium-sized furnaces.

Expected results

The project expects to obtain the following results:

- Implementation of an improved oxy-combustion technology in small and medium-scale furnaces;
- A 23% reduction in CO_2 emissions linked to tableware glass production;
- A 90% reduction in NO_x emissions linked to tableware glass production; and
- A 23% reduction in energy consumption (savings of 700 Mwh/yr).

Smart net metering for promotion and cost-efficient grid-integration of PV technology in Cyprus

Project background

Two interrelated and universal problems and challenges remain for those involved in energy production. The first concerns the excessive and unsustainable use of conventional fossil fuels, and the second is the low penetration of clean, sustainable energy sources, in particular PV, in the energy mix of many countries.

The potential of solar energy has not yet been fully exploited. Even in countries with high solar insolation (>2000kWh/m²) such as Cyprus, the penetration of solar energy in the overall energy mix is still low. PV technology can, however, play a crucial role in helping to achieve ambitious targets for increasing the share of renewables in the energy mix in Europe, as well as improving the security of Europe's energy supply.

Project objectives

The LIFE+ SmartPV project aims to point the way towards a more economically and environmentally sustainable electricity grid in Cyprus and Europe.

Specific objectives are to:

- Develop and validate a cost-effective scheme for higher RES penetration in the energy mix of Cyprus. The aim is to achieve optimisation of PV grid connection using innovative net-metering and remote monitoring systems at 300 pilot sites in Cyprus;
- Offer market-driven incentives to consumers who become local energy producers ('prosumers'), thus alleviating the need for costly Feed-in-tariff (FIT) schemes. The aim is to increase the share of decentralised PV energy production in Cyprus, which is vital for achieving a diverse energy mix;
- Facilitate the implementation in Cyprus of EU environment policies; and
- Use the knowledge gained in the optimisation of net metering in Cyprus to develop metering schemes and policies in other EU countries.

Expected results

- A metering tool validated and optimised using the data from the pilot sites. The tool will be made available to authorities/utilities in Cyprus and the EU for optimising grid operation methods;
- 300 pilot net-metering installations with remote data access, which will provide long-term data for monitoring production, consumption, and environmental conditions, as well as serving as focal points for promotional campaigns, and for demonstrating the benefits of RES;

LIFE12 ENV/CY/000276
LIFE+ SmartPV



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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George E. GEORGHIU

Duration of project:

44 months (01/07/2013 – 01/03/2017)

Total budget in euro:

1,219,838.00

EC contribution in euro with %:

568,464.00 (50.00%)

Theme: Climate change – Energy: Energy supply

- An estimated reduction of about 1kg of CO₂ per KWh of produced energy from the pilot sites, compared to traditional diesel generators used in the Cypriot grid. For 300 prosumers (about 10kWp installed per prosumer on average), the annual energy gain will be around 5GWh, with a reduction in CO₂ emissions of about 5000 tonnes per year;
- A set of guidelines on optimal net-metering policies in Cyprus distributed to public authorities, utilities and policy makers;
- Training of 300 consumers on net metering, energy saving practices, and energy management; and
- A transnational collaborative network of actors in the energy sector, which will facilitate an ongoing exchange of information on the performance of strategies to increase the share of PV electricity, as well as on the use of AMI and system automation for the efficient use of energy in buildings.

Sustainable management of livestock waste for the removal/recovery of nutrients

Project background

Intensive livestock farming has greatly affected the use of manure to replenish the soil, leading to the accumulation of macro-nutrients, such as nitrogen, phosphorus and potassium, and heavy metals (in particular, copper and zinc), and consequently to the increased risk of water and atmospheric pollution. Animal farming is responsible for odorous substances (ammonia) and emissions of greenhouse gases (GHGs) such as methane (CH₄) and nitrous oxide (NO₂).

Livestock waste management in Cyprus is particularly important since several piggeries, poultry and other livestock farms are in operation. However, management practices are inadequate and uncontrolled waste disposal is common. The size of the island and the location of populated areas have meant that such practices have affected the supply of water for irrigation and residential use.

Project objectives

The LIVE-WASTE project aims to:

- Develop, demonstrate and evaluate an integrated system for the treatment of livestock waste. The developed prototype system will be installed at a site where livestock waste is readily available to be used as raw material in the anaerobic digestion unit. The system involves several advanced, integrated processes for the sustainable treatment of livestock waste. These consist of anaerobic digestion (AD) for the treatment of livestock waste for biogas production; a sequencing batch reactor (SBR) for the treatment of the liquid stream produced from the AD, resulting in high quality effluent that can be reused for several purposes; composting for the treatment of the solid stream, and an odour-abatement system for the elimination of volatile organic compounds (VOCs) and odours from the process;
- Introduce and implement innovative solutions for livestock waste management with a low carbon footprint;
- Recover materials and energy from livestock waste to produce reusable effluent;
- Develop and disseminate a strategic plan on sustainable decentralised livestock waste management in line with EU and national legislation;
- Develop and identify concrete market opportunities for the end products; and
- Develop and demonstrate an innovative assessment tool integrating the principles of LCA, cost-benefit analysis and the current legislative framework for the evaluation of system performance and end-product quality.

LIFE12 ENV/CY/000544
LIFE LIVE-WASTE



Beneficiary:

Type of beneficiary

University

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Costas COSTA

Duration of project:

36 months (01/09/2013 – 31/08/2016)

Total budget in euro:

2,147,182.00

EC contribution in euro with %:

1,073,591.00 (50.00%)

Themes: Industry-Production: Agriculture – Fisheries / Waste: Agricultural waste

Expected results

- Identification of livestock waste production sources;
- An integrated methodology for effective livestock waste management;
- High-quality compost and treatment of effluent phosphorus;
- Minimisation of the environmental disturbance resulting from the production, treatment and disposal of livestock waste;
- Reduction of greenhouse gas emissions;
- An assessment tool for the environmental and socio-economic evaluation of the livestock waste management;
- A strategic plan for the integrated management of livestock waste in EU countries; and
- Assessment of the environmental impact and the burden on climate change from current livestock waste management practices.

Quantification and valuation of ecosystem services to optimise sustainable re-use for low-productive drained peatlands

Project background

The natural state of mires in Finland has deteriorated as a result of large-scale drainage, the consequent overgrowing of open mires and the isolation of pristine mires. Large-scale drainage has also significantly increased environmental loading and widely weakened the state of these water bodies. Northern peatlands, the target ecosystem, play an important role in the global carbon cycle. In their pristine state, mires sequester large amounts of atmospheric carbon dioxide (CO₂), and peatlands have been major global carbon stores for millennia. Peatlands are also natural sources of another greenhouse gas (GHG), atmospheric methane (CH₄).

Project objectives

The main objective is to quantify and evaluate ecosystem services to assist land-use planners and policy-makers in making ecologically, economically and socio-culturally sustainable land-use decisions. This objective will be met by developing and demonstrating a decision-support system, where ecological and economic data are aggregated to numerically optimise cost-efficient land-use options so that benefits from ecosystem services are safeguarded. The system will be tested and demonstrated to optimise the reuse of low-productive drained peatlands, which is the key issue concerning peatland use in Finland. The decision-support system provides an innovative, quantitative approach to increase the sustainability of peatland and reduce conflicts concerning its use, and it is applicable to any land-use planning, where ecological, economic and socio-cultural values may be in trade-off.

The specific objectives of the project are:

- The development and demonstration of a decision-support system to quantify and value ecosystem services and ecologically, economically and socio-culturally optimise sustainable land use;
- To consolidate and increase the knowledge base on the impacts of peatland use on ecosystem services through the compilation of multiple datasets and state-of-the-art modelling;
- To enhance general awareness, reduce conflicts, and promote stakeholder cooperation concerning the use of peatlands; and
- To promote the sharing and use of long-term monitoring data and scientific information in land-use planning.

LIFE12 ENV/FI/000150
LIFEPeatLandUse



Beneficiary:

Type of beneficiary

Research institution

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Anne TOLVANEN

Duration of project:

60 months (01/07/2013 – 30/06/2018)

Total budget in euro:

2,863,405.00

EC contribution in euro with %:

1,431,702.00 (50.00%)

Theme: Land-use and Planning: Spatial planning

Expected results

- The creation of a new, innovative decision-support system that quantifies the state of selected ecosystem services and optimises their levels to fulfil requirements and constraints set at regional, national and EU levels;
- Increased knowledge concerning the impacts of peatland use on the biodiversity, environmental loading, GHG balance and monetary value of low-productive, drained peatlands;
- Increased awareness and understanding of the sustainable use of peatlands. A participatory decision-support tool will be tailored and tested by at least 20 stakeholders in a planning process; and
- Data from long-term monitoring, published sources and newly-established monitoring will be aggregated into a database that can be used to model, predict and optimise the impacts of sustainable peatland use.

Climate change indicators and vulnerability of boreal zone applying innovative observation and modelling techniques

Project background

The magnitude of climate change is considered to be dependent on the atmospheric load of the two most important greenhouse gases, carbon dioxide (CO₂) and methane (CH₄). The terrestrial biosphere plays an important role in the global carbon balance, and boreal forests and peatlands are an important part of the global carbon cycle. The future development of carbon and water balances and their relationship to climate change in boreal zones are currently poorly known. Such knowledge gaps are particularly acute at regional level, and obtaining accurate figures of country-based carbon balances and their future development is a challenge.

Project objectives

The LIFE MONIMET project aims to fill knowledge gaps and better understand the future development of carbon and water balances and their relationship to climate change in boreal zones. It will also fill knowledge gaps concerning indications of a region's vulnerability by implementing an innovative approach to in-situ monitoring and mapping of climate change indicators that have an influence on the mitigation potential and vulnerability estimates of boreal forests and peatlands. The approach is based on a combination of different information sources describing phenology, CO₂ and CH₄ exchange, land cover, snow evolution and albedo. The information sources include in-situ observations and Earth Observation (EO) (satellite) data, as well as ancillary data supporting vulnerability assessments. Dedicated high resolution regional models will be applied to describe climate and land surface fluxes of carbon and water by different ecosystems.

Actions carried out to achieve these objectives shall involve:

- Collecting information, data and expertise that is currently spread over several institutes, in order to build a comprehensive platform for analysing climate change effects on seasonal dynamics;
- Establishing links and adding value to existing monitoring mechanisms such as ICOS and EO systems (GMES) and making use of data acquired in previous LIFE-funded - and other - projects related to ecosystem monitoring;
- Creating a new webcam monitoring system in order to facilitate EO systems by providing time-series of field observations for calibration and validation, as well as to improve the assessment of forest ecosystem services;

LIFE12 ENV/FI/000409
LIFE MONIMET



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Name of contact person

Ali NADIR ARSLAN

Duration of project:

48 months (02/09/2013 – 01/09/2017)

Total budget in euro:

2,755,288.00

EC contribution in euro with %:

1,366,952.00 (49.61%)

Themes: Climate change – Energy: Adaptation to climate change / Risk management: Risk assessment and monitoring

- Synthesising modelling and observation approaches to identify climate indicators; and
- Linking the climate change indicators and their effects in order to create vulnerability maps of boreal zones in connection to climate change scenarios.

Expected results

- A harmonised webcam network for monitoring the seasonal cycle in boreal ecosystem carbon exchange;
- A demonstration of the mapping of climate indicators in boreal forest zones; and
- A demonstration of the vulnerability assessment for Finnish municipalities to climate change effects.

Utilisation of by-products and alternative construction materials in new Mine Construction

Project background

Mining and quarrying waste is a significant source of pollution and general environmental degradation of soil, in particular of freshwater ecosystems that can also lead to potential health problems for animals and humans. Mining operations also produce variable amounts of waste rock and tailings material. More than 400 million tonnes of waste from the extractive industries is produced each year in the EU. In Finland alone 50 million tonnes of mining waste is produced each year, as well as 15-20 million tonnes/yr of tailings material.

Although some of the mining waste can be replaced as backfill during mining or used elsewhere, large quantities of waste rock and tailings are still commonly stockpiled around mine sites. The creation of mining waste storage facilities uses a considerable amount of materials, most of them originating from non-renewable and ultimately finite resources, such as eskers, rocks and top soils. In addition to primary aggregates, imported commercial oil-based geosynthetics (bentonites, geomembranes) are used. The potential pollution hazards associated with storage of the tailings slurry vary with different mining operations. The tailings disposal area is usually a pond that has been created by the construction of a dyke or a dam to retain the tailings slurry.

Project objectives

The project aims to demonstrate a technically and environmentally feasible alternative for remediating mine sites without using commercial sealing products such as bentonitemattes and geosynthetic geomembranes. The project is expected to use waste material to carry out the remediation processes with help from an innovative technology based on chemical-and physical stabilisation effects, through which material combinations can be transformed into valuable sealing layer materials. Physical stabilisation means that the material will become geotechnically stronger. Specifically the project will oxidate sulphate minerals leading to acid rock drainage (ARD). The project will demonstrate the rich Ca-content, alkaline characteristics, low carbon footprint and application potential of the new method.

The project also aims to reduce the need for commercial oil-based products and preserve primary aggregates and raw materials. Outcomes are intended to protect landscapes, forests and local forestry livelihoods, wildlife, plants, recreation and other nature values. Use of

LIFE12 ENV/FI/000592
LIFE+ UPACMIC



Beneficiary:

Type of beneficiary

International enterprise

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Heikki HÄMÄLÄINEN

Duration of project:

62 months (01/07/2013 – 31/08/2018)

Total budget in euro:

5,278,182.00

EC contribution in euro with %:

2,500,339.00 (50.00%)

Themes: Industry-Production: Mining – Quarrying /
Waste: Industrial waste

lifecycle assessment (LCA) and lifecycle costing (LCC) tools will help to verify the technology's environmental credentials.

Expected results

- Produce at least three practical civil-engineering applications and demonstration pilots to show how new types of industrial by-product combinations can be successfully used in mine remediation structures, without compromising overall environmental protection targets; and
- Deliver knowledge, information, and methodological guidance for key target groups via active dissemination events and effective dissemination tools.

Reduction of waste water nitrogen load: demonstrations and modelling (N-SINK)

Project background

Protecting the Baltic Sea from eutrophication problems remains a high policy priority for the EU. Nitrogen concentrations in rivers flowing into the Baltic Sea have increased in recent decades. This problem has been linked to wastewater and agriculture. Wastewater treatment plants can remove >95 % of phosphorus, but usually < 70% of nitrogen. Hundreds of wastewater treatment plants (WWTPs) are currently waiting for a decision about whether or not they have to invest in new nitrogen-removal processes, and many of these are located in remote inland areas.

Project objectives

The project aims to demonstrate cost efficient wastewater treatment processes for nitrogen removal in order to reduce eutrophication of the Baltic Sea. In particular, it will demonstrate an innovative sediment filtration process for reducing the nitrogen load when wastewater nitrogen is released as nitrate. This will use the natural ecosystem service provided by the sediment.

The basis for this innovation is that micro-organisms living in the sediment have an enormous capacity to reduce nitrate to nitrogen gas through denitrification. In this demonstration, wastewater released from sewage plants as a point source will be directed to a wider area near the sediment where denitrification takes place. With this new sediment filtering system the nitrogen load can be reduced in an economically and environmentally sustainable way. Outcomes expect to highlight how the efficiency of nitrogen removal could be increased, especially in small-medium sized WWTPs.

A phased project approach will occur. The first phase involves planning and preparing the main demonstration plant. Two project sites will be selected for the demonstration and two sites will act as control sites where the year-to-year variation in the denitrification activity will be measured. In the second phase, the project will demonstrate the changes and effectiveness of nitrogen removal in recipient waters by collecting long-term data from several WWTPs and from the downstream rivers and lakes. The target areas include Lake Vanajavesi and its drainage basin as well as River Porvoonjoki and its drainage basin.

Finally, the economic and environmental costs of various actions to decrease nitrogen loading into lakes and rivers

LIFE12 ENV/FI/000597
LIFE+ 2012 N-SINK



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Duration of project:

48 months (01/08/2013 – 31/07/2017)

Total budget in euro:

1,188,260.00

EC contribution in euro with %:

594,130.00 (50.00%)

Theme: Water: Waste water treatment

will be mapped and calculated using a state-of-the-art spatial optimisation framework model. The optimisation model is to be used for comparing the costs and effects of a number of nutrient abatement measures that can be carried out at different parts of the watershed and for determining the best combination of spatial and cost parameters. Such analysis will also allow the new sediment filtration measure to be compared (economically) against existing treatment measures.

Expected results

The project will produce a series of reports covering:

- Water quality changes in recipient waters;
- The new alternative method for nitrogen removal;
- The environmental effectiveness of nitrogen removal; and
- Scenarios of nitrogen fluxes in watersheds and the role of nitrogen removal at landscape level.

Improved HEAt Recovery in clay roof Tile and brick production

Project background

The terracotta building materials industry uses mainly natural gas to dry and fire clay to make roof tiles and bricks. The gas combustion in dryers and kilns is responsible for 70% of the sector's CO₂ emissions. The sector also uses large quantities of water for humidifying the clay and is responsible for greenhouse gas emissions of sulphur, chlorine and fluorine. The volatile compounds may be present in certain types of clay and can be freed into the environment depending on the type of firing.

In a typical modern clay tile manufacturing plant, equipped with classical recovery systems: 90% of the thermal consumption of the dryer is lost in fumes and returned into the atmosphere; 20% of the warm air recovered in the kilns during cooling of the products is used in the dryer, or the pre-oven; and 45% of the thermal consumption of the kiln is lost in fumes and returns into the atmosphere. The recovery of these losses is one of the main areas in which energy efficiencies in the terracotta manufacturing process can be achieved.

Project objectives

The project's overall objective is to demonstrate the feasibility of a thermal recovery system for the clay and roof tile industry that combines a low temperature and corrosion resistant heat exchanger (on the kiln fumes) and an industrial ammonia heat pump (on the dryer fumes). The pilot system will be installed in a roof tile factory in south-west France.

The recovered heat will pre-heat the air inflow into the dryer. The water condensed by the heat pump will be reused to moisturise clay for the shaping of the products in place of the use of more water. The heat exchanger on the kiln fumes will clean these fumes from their volatile pollutants (fluorine, sulphur, chlorine) by producing acid concentrates that will be neutralised.

The project aims to show that a significant part of the thermal losses of a clay brick or roof tile production unit can be recovered and reused in the process; and that the new recovery system can be retrofitted easily and safely into an existing clay brick or roof tile factory.

Other specific goals include:

- Recovery of water by condensing steam for reuse in the clay process, thereby significantly reducing water consumption;

LIFE12 ENV/FR/000142
LIFE HEART



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

TERREAL

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François AMZULESCO

Duration of project:

48 months (01/07/2013 – 30/06/2017)

Total budget in euro:

2,982,466.00

EC contribution in euro with %:

997,815.00 (50.00%)

Theme: Climate change – Energy: Energy efficiency

- Purification of the kiln fumes of volatile pollutants; and
- A new standard for clay brick and roof tile technology.

Expected results

Specific estimates are:

- A reduction of natural gas consumption by 17 GWh HCV/yr (- 27%);
- An increase in power consumption by + 3.7 GWh/yr (to operate the heat pump, the ventilators and the heat transfer fluid circuit);
- A reduction of direct CO₂ emissions by 3 170 tonnes/yr (- 23%);
- An increase of indirect CO₂ emissions by + 210 tonnes/yr, taking into account the French emissions factor for electricity; and
- A reduction in water consumption by 10 000 m³/yr (- 90%).

The system will also clean the fumes with data measured during the project and an additional benefit will be the ease of installation of the system to existing factories.

Pilot experiments on sustainable and participatory management of recreational seafood hand harvesting

Project background

Sea angling is a popular pastime for many EU citizens. However, studies indicate that significant numbers of these people are unaware of environmental regulations related to angling. Other studies indicate that anglers are likely to support the aims of such regulations and act accordingly if they are made more aware about environmentally-appropriate approaches to their pastime.

Project objectives

The core goal of the project is to validate effective and transferable methods for promoting sustainable approaches to shore-based sea angling in 11 pilot areas.

Specific aims include:

- Implementing an ecosystem approach to managing the activity thereby increasing sustainability. This will be achieved through a new local and national-level governance system; Better understanding and dealing with the impacts of recreational fishing from the shore on the natural coastal environment;
- Developing awareness in order to stop the erosion of coastal biodiversity linked to fishing practices; and
- Contributing to the design and implementation of management plans for Marine Protected Areas that are subjected to pressure linked to recreational fishing from the shore.

Expected results

The project expects to achieve the following results:

- Improved knowledge about the practices of recreational fishing from the shore and their impacts. This will be achieved through a territorial diagnosis of each of the 11 pilot areas, covering factors such as numbers of anglers, where and when they fish, catch data, angling practices and ecological assessments. Findings will inform the design and dissemination of methodological guidelines promoting relevant good practices (including references to Natura 2000 site management), to be shared with local stakeholders;
- Negative impacts from shore angling on biodiversity in the project areas will be reduced through the implementation of 11 locally-tailored action plans. Each action plan will be subject to an evaluation to determine its effectiveness in facilitating behaviour change amongst shore anglers;
- Involvement of anglers in foreshore management and implement local governance arrangements in the 11 pilot territories; and

LIFE12 ENV/FR/000316
Life+-PêcheAPIedeLoisir



Beneficiary:

Type of beneficiary

Park-Reserve authority

Name of beneficiary

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Stéphanie TACHOIRES

Duration of project:

51 months (01/07/2013 – 30/09/2017)

Total budget in euro:

3,899,625.00

EC contribution in euro with %:

1,949,810.00 (50.00%)

Themes: Information-Communication: Awareness raising – Information / Services and Trade: Sports and Recreation activities

- Establishment of a sustainable process of stakeholder networking at local and national levels on the themes addressed by the project.

PHOtovoltaic STEel Roof: ready to plug in BIPV roofing steel envelope based on green innovative technologies and processes

Project background

Solar power output is expected to grow by at least 25% annually over the next 10 years. In order to further enhance the impact of photovoltaic (PV) electricity production, technology costs must be lowered to achieve 'grid parity'.

Two generations of PV technologies have been in mass production to date. These are: mono and polycrystalline silicon (1st generation PV with 86% market share); and second generation thin films technologies (a-Si, CdTe, and copper indium gallium diselenide - CIGS). Thin film PV is expected to reach 20% market share by 2016. A recent study shows that CIGS thin film technologies have a lower carbon footprint than crystalline silicon PV.

Project objectives

The project aims to demonstrate cost effective production processes for steel CIGS solar cells on a pilot scale. This will involve the preparation of an innovative steel frame combining roof and base components that will lead to lower greenhouse gas emissions and eliminate the need for an aluminium support.

The CIGS coating will be connected directly to the new steel frame and because the material has a high absorption coefficient, meaning it is highly able to absorb sunlight, a much thinner film is required than for other semiconductor materials. CIGS devices also offer benefits for 'end-of-life' recycling over other PV technologies.

Expected results

The project expects to offer a number of benefits in terms of GHG emissions and materials reduction/recyclability:

- A 30% reduction of the global warming potential with respect to a framed PV module installed on a metallic roof, representing 46 kg CO₂ eq./m²;
- A 15% reduction of the carbon footprint and the primary energy use for manufacturing CIGS modules, thus leading to a savings of 15.8 kg CO₂ eq./solar cell m². This will be achieved by reducing the energy required by 50% during the selenisation process, and by introducing energy efficient management of the solar cell installation;
- A 1.5% increase of the kWh/kWp produced with respect to currently available BI-PV modules on steel roofs, mainly achieved by reducing the shadow effect on the steel profile and by optimising the PV module global design;

LIFE12 ENV/FR/000479
LIFE-PHOSTER



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Renaud VIGNAL

Duration of project:

54 months (01/07/2013 – 31/12/2017)

Total budget in euro:

5,062,824.00

EC contribution in euro with %:

2,456,412.00 (50.00%)

Theme: Climate change – Energy: Energy supply

- A reduction of the amount of the rare toxic element cadmium by 20 to 25 g per m² of PV module (100% reduction in comparison with existing technologies); and
- The achievement of an eco-designed BI-PV Roofing envelope, of which at least 85% (in weight) is recyclable. With a foreseen weight of the LIFE-PHOSTER envelope of 10 kg/m² a minimum 8.5 kg/m² of material can be recycled at the module's end of life.

LIFE AUTO: Demonstration and validation of an innovative automatic fuel additives system for diesel fuel

Project background

The implementation of more stringent European diesel exhaust emission standards (e.g. EURO 5 and EURO 6) forces the automotive industry to use the Diesel Particle Filter (DPF) technology that is common in passenger cars in Europe. To enhance DPF regeneration, one of the main technologies uses an 'on board' fuel additive, called Fuel Borne Catalyst (FBC).

In addition, post EURO 6 will impose additional durability requirements to make the automotive industry develop clean vehicles, including vehicles running on biodiesel fuels from different sources. As things stand, increased use of biofuels may have side effects on the fuel injection system, reducing engine performance (increased pollution and fuel consumption), reliability and durability.

Project objectives

The project will demonstrate the feasibility of a unique, environmentally-friendly system (combining chemistry, hardware and software), replacing the current diesel fuel filter, additive tank, dosing pump and electronic controller unit. It will improve fuel efficiency and compatibility with biofuels and reduce emissions of diesel engines:

Project actions will be divided into two main phases. Firstly, the beneficiary will seek to define the best option for improved engine performance (fuel consumption and emissions) and protecting the fuel circuit elements. Based on these options the molecules will be chosen and the chemical formulation calculated. One of the main goals will be to increase the stability of biofuels through improved resistance to oxidation.

Secondly, the project will then combine the fuel dosage system and additives into so-called 'Bprototypes', that will be made according to real engine specifications and tested on full-scale test fleets to demonstrate the full scope of the environmental benefits in the real-world.

Expected results

This process will lead to a substantial reduction of GHG emissions and will maintain the attractiveness of diesel vehicles in comparison with alternative powertrain technologies, such as gasoline, hybrid and electrical vehicles. Specifically, it will:

- Allow the automotive industry to meet the EU targets for 2015 and 2020 (130 and 95 gCO₂/km) at lower cost, inducing a faster market uptake;

LIFE12 ENV/FR/000480
LIFE AUTO



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Name of contact person

Thierry SEGUELONG

Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

3,276,160.00

EC contribution in euro with %:

1,598,080.00 (50.00%)

Theme: Industry-Production: Engines - Machinery - Vehicles

- Enable use of biodiesel and renewable fuels (up to 10% by 2020 in Europe and up to 30% in the vehicle fleet operators) for a CO₂ emission reduction of 4-12 CO₂/km;
- Save 3-5% of fuel in urban driving conditions through the use of the fuel additive technology in combination with the Catalysed-DPF (CO₂ reduction of c. 7 gCO₂/km); and
- Increase high combustion efficiency by 3-5% (equivalent to 5-7 gCO₂/km) with the use of the deNO_x catalyst (from EURO 6).

An innovative process for the treatment of phytopharmaceutical effluent and new uses for farmers

Project background

Europe's agricultural sector is linked with the pollution of surface waters, groundwaters and seas by nutrients and pesticide residues. Decreasing the dispersal of these pollutants is a priority for environmental programmes and regulations in France (i.e. ECOPHYTO 2018) and Europe (the Water Framework Directive and Directive 2008/105/EC on environmental quality standards in the field of water policy). Pollution of water mainly occurs through (i) passive diffusion as a result of spreading products on crops, and (ii) active pollution caused by washing machinery and tractors - most of the time at the same location. A French regulation (2006) prompts users to manage their wastes coming from phytosanitary treatments in various ways but with no specific technical requirements. As a result, cost and technical barriers often prevent the implementation of such processes for managing plant protection residues.

The CBL and Barre Industries have developed a biological process to metabolise phytosanitary molecules, based on the use of bacteria selected in the laboratory. The process has been implemented over a five-year period on a test site and findings indicate a degradation efficiency of more than 90% of the phytopharmaceutical residues.

Project objectives

The LIFE-PHYTOBARRE project aims to build on the results of these earlier tests and demonstrate the method's applicability in commercial conditions. This will involve further testing of biological processes to metabolise farm-based phytosanitary molecules using lab-selected bacteria. The project aims to achieve the following:

- Produce a technological solution that that it is easy to use and maintain; and
- Develop a solution that efficiently reduces pollution risks from farms working with different crops and phytosanitary products, as well as in various geographic locations and climates.

The project's solution will be implemented at three demonstration sites to test its efficiency for farmers. As well as working to ensure the technology's ease of future uptake by farmers, project actions will also focus on monitoring the degradation of pesticides over three years to validate the technology's effectiveness.

Different communication tools including videos will be used to highlight the technology's opportunities and

LIFE12 ENV/FR/000530
LIFE-PHYTOBARRE



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Name of contact person

Daniel GARCIA

Duration of project:

39 months (01/10/2013 - 30/12/2016)

Total budget in euro:

1,393,028.00

EC contribution in euro with %:

674,658.00 (50.00%)

Themes: Industry-Production: Agriculture - Fisheries / Water: Waste water treatment

benefits for farmers in terms of changing their operations to improve waste management systems.

Expected results

The project aims to achieve the following results:

- Demonstrate the new technology's effectiveness;
- Change farmers' behaviour through a series of awareness-raising events and activities. These will target agricultural communities, local authorities, agricultural colleges, schools, and universities, as well as farmers directly; and
- Help European farmers to safely treat 360-800 tonnes of phytosanitary products on an annual basis.

Development of a new generation Li-ion battery with low environmental impact by setting up a prototype line

Project background

Li-ion batteries have several important industrial applications, including for roaming applications, such as mobile phones, laptops, tablets etc., and for stationary applications (UPS - uninterruptible power supply, and ESS - energy storage system batteries). New applications in all-electric cars are now also emerging.

Up until now, the development of Li-ion technology has largely focused on achieving optimum performance, but current manufacturing processes give rise to considerable environmental impacts: they require large amounts of copper and use a significant quantity of a dangerous solvent, NMP (N-Methyl-2-pyrrolidone). They are also energy intensive and produce emissions of greenhouse gases.

It is, however, possible to reduce these impacts. In particular, energy consumption depends on the production location and local costs of energy; and certain solvents are more environmentally friendly than others (for example, water can be used instead of NMP as a solvent).

Project objectives

The LIFE BiBAT project's main aim is to pilot the production of a new generation of more environmentally friendly Li-ion batteries, based on a bipolar design. With a view to reducing energy and resource use in the Li-ion battery manufacturing processes, the project will combine two types of technological innovations:

1. Bipolar technology will be applied on a pilot scale and some new process steps will be explored (stacking, electrolyte filling,...);
2. Evolutions and optimisations of the processes will be tested in order to reduce the environmental impact of battery production (to minimise energy needs and eliminate the use of NMP and copper). The new processes will provide an ecological alternative to existing ones, by reducing nonrenewable energy needs by at least 60% and mineral resource needs by 70%.

The innovative aspect of the project concerns the use of bipolar technology, whereby different battery cells are operated in parallel. This provides several technological and commercial advantages over conventional batteries, including: very low environmental impact; longer life cycle; higher power capability; improved safety; lower cost; and lower internal resistance, and can lead to many types of applications, such as in electric buses, trains, forklifts, automatic guided vehicles, port cranes, etc.

LIFE12 ENV/FR/000570
LIFE BiBAT



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Luc FEDERZONI

Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

2,736,132.00

EC contribution in euro with %:

1,368,066.00 (50.00%)

Theme: Climate change – Energy: Energy supply

Expected results

Based on its new architecture, the project will aim to:

- Reduce the global warming impact of Li-ion battery manufacturing by a factor of two;
- Reduce the negative impacts of the manufacturing processes on ecosystem quality by 50%;
- Reduce human toxicity caused by Li-ion battery manufacturing;
- Improve Li-ion battery life by a factor of two for micro-hybrid cars; and
- Increase micro-hybrid applications and related market opportunities.

Carbon plan of French dairy production

Project background

Dairy production has opposing effects on climate change. It generates greenhouse gas (GHG) emissions but can regulate climate through carbon storage in soils. Hence, cattle rearing management techniques can strongly impact on the sustainability of this activity. Nevertheless, studies reveal that knowledge gaps exist amongst French Dairy farmers about the use of different agricultural practices on GHG emissions, and the availability of new innovative practices that possess low carbon footprints.

Work is thus needed to increase awareness amongst French dairy sector stakeholders about their role in contributing to the EU's climate action agenda.

Project objectives

The main objective of the LIFE Carbon dairy project is to promote a milk production approach that is capable of reducing GHG emissions by 20% over 10 years. To achieve this goal, the partners aim to:

- Provide livestock farmers and their technical and administrative environment with tools and methods to understand the issue, to guide and modify their technical choices in order to reduce GHG emissions and preserve carbon stored in soils;
- Promote innovative livestock farming systems and associated practices to ensure the technical, economic, environmental and social sustainability of dairy farms, and thus to improve interactions between climate change and livestock production;
- Launch a national campaign to demonstrate to livestock farmers and agricultural advisers the interest and feasibility of a 'climate roadmap' for milk production; and
- Develop this 'roadmap' for milk production with carbon action plans adapted to each production system and a relevant partnership strategy implemented at the national level.

The project will be conducted in six representative dairy regions of France and investigations will concern a sample of 3 900 farms located across the six regions to enable the large-scale assessment of carbon impact.

Expected results

The project expects to achieve the following:

- An effective reduction of 139 761 tonnes of CO₂ emissions in the 3 900 demonstration farms (in compli-

LIFE12 ENV/FR/000799
LIFE Carbon dairy



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Jean-Baptiste DOLLE

Duration of project:

60 months (01/07/2013 – 30/06/2018)

Total budget in euro:

2,383,037.00

EC contribution in euro with %:

1,191,515.00 (50.00%)

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Industry-Production: Food and Beverages

- ance with the objectives of 20% GHG reduction over 10 years);
- Creation of tools for farmers and technical advisers that can be used to assess the carbon impact of milk production and support decision-making;
- Biennial assessments of the GHG emitted by the 3 900 demonstration farms within the four-year duration of the project (i.e. two assessments in total);
- Creation of a database of technical, economic and environmental outcomes achieved by the demonstration farms;
- Consolidation of carbon plans on 60 innovative farms;
- A climate roadmap for milk production, describing the action plans and the partnership strategy to be put in place for the deployment of the approach on a national basis; and
- An analysis of the economic and social feasibility of the carbon plan in milk production, including its economic impact on the dairy industry.

Biological two-stage biogas treatment process

Project background

The development of biomass as a primary energy source is one of the solutions proposed by the EU and France as an alternative to the use of fossil fuel resources. Biogas is a relatively new, effective and sustainable source of energy. It is produced from organic waste streams (municipal sludge and food waste streams) and non-lignin biomass. Potential environmental benefits include: reduction in carbon dioxide (CO₂) emissions by displacement of fossil fuels; reduction in waste through energy recovery; and reduction in harmful greenhouse gas (GHG) emissions from landfills.

However, in order to be able to power engines, biogas must be pre-treated prior to combustion. In particular, several components need to be eliminated (water from digesters or ventilation shafts and landfill collection systems, compounds such as hydrogen sulfide (H₂S) or mercaptans, as well as siloxane, which corrodes gas engines).

Project objectives

The initial aim of the LIFE BIONOBO project is to use the team's expertise in biogas treatment to develop an enhanced bio-treatment process with high performance and competitive lifecycle costs so as to increase and expand the use of biogas and landfill gas. The process will be designed to be low-cost, easily understood and easy-to-implement to encourage a rapid uptake of the technology by end-users.

The project only focuses on the pre-treatment of biogas for injection in engines. In comparison with existing solutions, the process will:

- Be entirely biological (with no chemical additives);
- Be highly effective for H₂S and siloxane removal;
- Be highly adaptable to all types of biogas (liquid effluent, solid waste, industrial waste and landfill, dairy, brewery, slurry/agricultural solid waste, sludge from wastewater treatment plants, municipal landfill);
- Consume less energy; and
- Produce less waste.

Expected results

Four pilot projects will be carried out in France and Ireland. The following technical results will be demonstrated:

- Adaptability of the natural biological process to any type of biogas;

LIFE12 ENV/FR/000802
LIFE BIONOBO



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Marc BEERLI

Duration of project:

27 months (01/07/2013 – 30/09/2015)

Total budget in euro:

1,028,172.00

EC contribution in euro with %:

488,210.00 (50.00%)

Theme: Climate change – Energy: Energy supply

- Significant H₂S removal - from 4000 ppm to 40 ppm;
- Significant siloxane removal - from 250 to 2 ppm;
- Ease-of-use and maintenance of the biogas treatment process.

Five years after the end of the project, the BIONOBO process is expected to be implemented in 300 units across the world each year. The dissemination of the process should lead to positive environmental impacts including:

- A reduction in GHG emissions - more than 200 000 tonnes of CO₂ and 160 000 tonnes of methane (CH₄) saved per year by 2020;
- A reduction in atmospheric H₂S emission of 2 000 tonnes;
- Increased engine utilisation and renewable power generation; and
- Replacement of chemicals (lignite coke) by a 100% biological technology using the minerals of seashells and mineral additives for the treatment of siloxanes (14 000 tonnes of chemical products replaced by 5 000 tonnes of waste sea shells every year by 2020).

Life Cycle in Practice

Project background

Improvements in resource and energy efficiency require a focus on reducing the environmental footprint of individual products, as well as of companies as a whole. This requires a 'cradle-to-grave' approach: from procurement/material extraction to downstream activities, including consumer behaviour and interrelations between product components, use and finally disposal. This may require efforts to train and/or educate suppliers, retailers and consumers. With such efforts, it could be possible to greatly improve the resource and energy efficiency of the building and construction, energy equipment and waste management sectors.

Project objectives

The general objective of the project is to help SMEs in France, Belgium, Portugal and Spain to reduce the environmental impacts of their products and services in the building/construction, energy equipment and waste management sectors through the application of lifecycle approaches – including Lifecycle analysis (LCA), ecodesign and environmental labelling. This will enhance resource efficiency and reduce environmental emissions relating to the products and services (i.e. the extraction and treatment of raw-material, manufacture, distribution, and use and disposal of the product or service - including all intervening transport steps).

The project aims to foster a widespread uptake of these approaches by SMEs by:

- Demonstrating the environmental and business benefits of applying lifecycle approaches through practical application in 32 businesses; and
- Building capacity for lifecycle approach implementation through the development of training materials, training of trainers and testing of training materials at the 32 SMEs selected for pilot testing.

Trainers and 'Lifecycle Champions' will play the following key roles:

- In providing physical and online resource centres to support the regional application of lifecycle approaches; and
- In building capacity in the four project regions for ongoing implementation of lifecycle approaches through an innovative 'Lifecycle Champion' network.

LIFE12 ENV/FR/001113

LifeCiP (LCiP)



Beneficiary:

Type of beneficiary

NGO-Foundation

Name of beneficiary

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Jodie BRICOUT

Duration of project:

34 months (02/09/2013 – 30/06/2016)

Total budget in euro:

1,825,211.00

EC contribution in euro with %:

899,816.00 (49.38%)

Themes: Environmental management: Life Cycle Assessment-Management / Industry-Production: Building

Expected results

The project will have a significant impact on the training of personnel who can contribute to the demonstration of lifecycle approaches. Key deliverables include:

- A Lifecycle Maturity Assessment, composed of a guideline for evaluating sectors, nine detailed internal reports for each country/sector and three sectoral summary reports;
- A network of 13 'Lifecycle Champions' trained in lifecycle thinking and the use of lifecycle tools for SMEs;
- An online platform and four resource centres based in participating regions to provide support on lifecycle approaches. Physical resource centres will display noticeboards introducing the project to the public;
- An online LCA-based environmental impact evaluation tool, tested in 32 SMEs;
- A guidance document on undertaking socio-economic impact evaluation with a lifecycle perspective, based on the results of the trials in 32 SMEs; and
- A series of nine Lifecycle Awards organised in the four participating regions.

Improvement of urban environment via an innovative and economically-viable logistic platform using green vehicles

Project background

Four out of five EU citizens live in urban areas and their quality of life is directly linked to their urban environment. In the last 10 years, European cities have made major efforts to tackle traffic congestion and related pollution. However, little attention has been paid to the goods distribution process, which is one of the major sources of pollution in urban areas.

Project objectives

The goal of the project is to demonstrate an integrated and innovative approach to urban logistics, encouraging cooperation amongst the actors involved, use of new distribution schemes and the implementation of a range of measures that will effectively contribute to the reduction of the negative effects of the current logistics processes on the urban environment.

The project aims to develop a new logistic tool, Urban Distribution Centre (CDU) to reduce the environmental impact of parcel deliveries (greenhouse gas and particulate matter emissions) and improve the quality of life (reduction of traffic and noise) in Annecy city centre. The project will test the applicability of the CDU as a sustainable and economically-viable 'last mile' delivery service. This integrated and innovative approach is strongly oriented towards cooperation in the logistics chain, the use of new distribution schemes and the implementation of regulatory, organisational, operational and technological measures.

Specific aims include:

- Improving the flow of goods in Annecy city centre through an efficient, competitive and durable urban distribution scheme;
- Reducing traffic congestion by decreasing the number of vehicles in circulation;
- Proposing new and efficient services to retailers and a better quality of service to carriers that lose time when delivering goods in a crowded city centre; and
- Improving the quality of life of citizens by reducing the environmental impacts of freight transport.

These aims will be achieved through technological developments, such as the adaptation of electric lorries of high load capacity to deliver goods from different transport operators to the city centre; and the use of innovative electrical bicycles to improve delivery to the least accessible areas.

LIFE12 ENV/FR/001125
LIFE + Urbannecy



Beneficiary:

Type of beneficiary

Regional authority

Name of beneficiary

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Pierre-Luc JACQUOT

Duration of project:

33 months (01/07/2013 – 31/03/2016)

Total budget in euro:

2,039,505.00

EC contribution in euro with %:

958,501.00 (50.00%)

Theme: Services and Trade: Transportation – Storage

Expected results

The main expected result is the creation of a logistic platform on the outskirts of Annecy.

Other expected results include:

- A 15% reduction in congestion caused by commercial and freight traffic. This will also increase pedestrian safety;
- A reduction of greenhouse gas emissions in Annecy. Given the characteristics of the city and its commercial configuration, a 40% reduction in the number of lorries is possible, which could result in CO₂ reductions of some 27%;
- A 30% reduction in noise related to traffic, thus improving the quality of life in the historical city centre for residents, visitors and tourists. This will also reduce the risk of damage to historic buildings caused by vibrations from freight traffic.

Landfill mining pilot application for recovery of invaluable metals, materials, land and energy

Project background

There are two environmental issues relating to landfill sites that form the backdrop to this project. Firstly, abandoned landfill or dump sites need to be stabilised and rehabilitated, since they have been constructed under loose technical specifications and many of them were unregulated at some point in their lifecycle. They are considered as environmental and health threats, responsible for various contaminants usually abundant in leachate and air emissions. In addition, they commonly occupy land close to existing settlements that could be reclaimed for human or natural activities.

The second issue is that it has been widely acknowledged in both scientific and policy forums that landfill sites are unintentional stores of large amounts of raw materials. Integrated and effective management of raw materials requires all disposed material that could be recycled or recovered to re-enter the cycle of production, leading to the increased availability of such materials and additional employment across the EU.

In Greece, in particular, the development and implementation of effective waste management practices has been slow. In the area of Chalkidiki, critical problems in municipal solid waste management have been identified relating to the collection and disposal of waste. These problems have a negative impact on the environment and affect tourist activities in the wider area.

Project objectives

The LIFE RECLAIM project aims to construct a temporary pilot application that will mine parts of existing landfills, separate useful materials and produce suitable products (concentrates), both ferrous and non-ferrous, which can be fed into a metallurgical process. The application will include a pre-processing and processing production line, as well as a beneficiation stage for non-ferrous metals, introducing innovation elements from the mining industry.

Specific objectives include:

- Turning landfill mining into a useful tool for the recovery of useful materials, especially ferrous and non-ferrous metals, landfill capacity, soil material, recyclable materials (such plastic and paper products) and land, as in the case of old landfills, which will lead to drawing up of a successful rehabilitation scheme with a minimal environmental footprint;

LIFE12 ENV/GR/000427
LIFE RECLAIM



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Georgios TENTES

Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

1,377,004.00

EC contribution in euro with %:

688,501.00 (50.00%)

Theme: Waste: Waste recycling

- Introducing the concept of post-disposal waste processing to the public;
- Identifying the potential of the procedure for metal recovery and site rehabilitation; and
- Implementing integrated waste management practices.

Expected results

The project expects to achieve the following results:

- Development of a web-based GIS database for operational landfills and uncontrolled landfills in Greece accessible via a website during and after the duration of the project;
- Demonstration of a pilot-scale installation for waste processing at the Polygyros landfill site;
- Processing of at least 1 000 m³ of waste for production of different concentrate samples;
- Drafting of a national action plan for landfill mining and strategic environmental assessment; and
- Socio-economic analysis of landfill mining.

Development & demonstration of management plans against -the climate change enhanced- invasive mosquitoes in S. Europe

Project background

In recent years, concern has arisen globally over the potential for an increase in mosquito-borne diseases because of changes in the distribution of invasive mosquito populations. Such changes are the consequence of environmental modifications, ecosystem disturbances and global climatic change. Predicted increases in rainfall and temperature are likely to both extend the distribution of mosquitoes and associated pathogens and shorten the development time of mosquito larvae and the extrinsic incubation period of pathogens. Warmer and wetter weather is likely to result in longer seasonal activity of mosquitoes and rising sea levels are expected to produce more areas of wetland habitat suitable as mosquito breeding ground. Indeed, a considerable increase in the spread of exotic invasive mosquito species has been observed in Europe since the late 1990s and it has been accompanied by the emergence and/or re-emergence in several EU countries of 'forgotten' mosquito-borne diseases such as chikungunya, dengue, West Nile fever and malaria. In the context of environmental and climate changes, it is particularly important to step up the surveillance of invasive mosquito species in areas at risk of establishing and transmitting the disease.

Project objectives

The LIFE CONOPS project aims to draw up integrated management plans for the effective and environmentally-friendly control of invasive mosquito species (IMS), preventing their entry, spread and establishment across Europe. Specific objectives include:

- The identification and characterisation of the current status of the IMS problem in terms of its entomological, environmental and socio-economic dimensions;
- Assessment of the environmental parameters that affect the establishment of IMS in European territories;
- The identification, listing and geo-reference of areas (in Greece and Italy) identified to be at high/medium/low risk of introduction and establishment of IMS;
- The development, optimisation and implementation of a novel monitoring device (prototype) at selected high-risk areas in Greece and Italy;
- The development and implementation of management plans that aim to confront the IMS threat at selected high-risk areas in Greece and Italy. These plans will take into account the current and future (projected) risk of climate change and its impacts and will aim to identify areas of high risk for IMS estab-

LIFE12 ENV/GR/000466
LIFE CONOPS



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Antonios MICHAELAKIS

Duration of project:

54 months (01/07/2013 – 31/12/2017)

Total budget in euro:

2,989,314.00

EC contribution in euro with %:

1,480,656.00 (50.00%)

Themes: Biodiversity issues: Invasive species / Climate change – Energy: Adaptation to climate change / Risk management: Human health protection

- lishment in the future. The plans will also aim to incorporate the use of previously developed biodegradable mosquito control substances; and
- Monitoring and assessment of the environmental and socio-economic impacts of the management plans.

Expected results

The project expects to achieve the following results:

- A network of 12 prototype devices for the monitoring (surveillance) of the IMS population in selected areas of Greece and Italy; and
- The development of integrated management plans for combating the IMS problem now and in the future, based on climatic and environmental projections.

Cross-Mediterranean Environment and Health Network

Project background

Public health indicators are regularly collected in EU Member States but they are hardly ever connected to the environmental condition of individuals. A major limiting factor in most environmental health studies to date has been the uncertainty in quantitative estimates of chronic exposure.

Project objectives

The CROME-LIFE project aims to assess the impact on human health of exposure to chemical agents originating either from environmental contamination (air, soil and water) or from consumer products (food contact materials, construction materials, cosmetics, clothes, etc.), through multiple routes – inhalation, ingestion and dermal contact – in four areas of southern Europe (Greece, Italy, Slovenia and Spain). The overall goal is to significantly improve exposure analysis by coupling environmental and biological monitoring and modeling. To this end, the project aims to demonstrate a technically-feasible integrated methodology for interpretation of human biomonitoring (HBM) data, which will allow for quantitative assessments to be made of the impact on human health of acute/chronic exposure to chemicals acting as neurodevelopmental and neurological toxicants and/or human carcinogens (e.g. PCBs and PBDEs, organochlorine and organobromine compounds).

The methodology applied will couple environmental monitoring data with human biomonitoring and epidemiological observations through the use of physiologically-based toxicokinetic (PBTK) and toxicodynamic (PBD) models. These models would allow the project to mechanistically associate the observed concentrations of contaminants in environmental media (air, water and soil) with human biomonitoring data already available to the project consortium and collected through targeted field campaigns.

The overall tool that will be developed will be directly linked to the decision-making processes of the competent local/regional and national authorities in the four demonstration sites. It will thus provide a more reliable scientific basis for environmental and public health protection decision-making, leading to more cost-efficient and effective environmental and public health management.

LIFE12 ENV/GR/001040
CROME-LIFE



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Denis SARIGIANNIS

Duration of project:

42 months (01/07/2013 – 31/12/2016)

Total budget in euro:

1,760,190.00

EC contribution in euro with %:

880,095.00 (50.00%)

Theme: Risk management: Human health protection

Expected results

The project's expected results will include:

- Operational demonstration of the use of human biomonitoring data for health impact assessment through the development of new standards for HBM data interpretation with environmental and exposure information in the four selected areas of southern Europe;
- Improved knowledge on the identification of the cause-and-effect relationship between different environmental stressors, biomonitoring data and observed adverse health outcomes, taking into account exposure and impact variations resulting from intrinsic (e.g. genetic susceptibility) and extrinsic (e.g. diet and socio-economic status) factors; and
- Increased understanding in the selected countries that using advanced biomonitoring and environment and health data analysis for efficient exposure assessment and health risk management.

REACH Database for Safety Data Sheets (SDSs) and Workplace Instruction Cards (WICs)

Project background

The construction and tourism industries are important components of the Greek economy. Knowledge gaps about chemical handling procedures exist among professionals from these sectors. Risks of occupational accidents and environmental pollution therefore pose potential problems and more capacity-building tailored to the specific needs of tourism and construction workforces is needed to reduce such risks. Particular attention is needed to improve awareness and understanding about the proper use of Safety Data Sheets. This can have a positive impact throughout the supply chain.

Project objectives

The LIFE READ project aims to demonstrate a technically feasible and more effective alternative method for communicating safety information about hazardous products used in the tourism and construction industries. The method will cover the full supply chain for Greece, from manufacturers and importers of hazardous materials to producers and wholesale distributors of formulated products to professional end users.

Actions carried out by the project to meet these goals will involve:

- Developing a public database, where companies that produce/import/formulate chemicals for construction and professional detergents, will be able to store and manage their SDSs. They will also be able to provide product information, such as whether it contains any substances considered as hazardous environmental pollutants, its carbon footprint, and any environmental certifications (e.g. Ecolabel);
- Transformation of SDSs into Workplace Instruction Cards (WICs) that can be referred to more easily in-situ by professional users;
- Translation of WICs to Albanian, Serbian and Bulgarian, in order to inform immigrant professionals about the risks of chemicals for their health and the environment;
- Promotion of EU Eco-labeled and low-carbon footprint chemical products; and
- The development of a methodology that can be easily transferred to other EU countries that suffer from similar knowledge gaps among construction and tourism workforces, as well 'Do-It-Yourself' consumers.

LIFE12 ENV/GR/001135
LIFE READ



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

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Areti VOULOMENOU

Duration of project:

24 months (01/10/2013 – 01/10/2015)

Total budget in euro:

393,083.00

EC contribution in euro with %:

193,541.00 (50.00%)

Themes: Information-Communication: Awareness raising, Information / Risk management: Human health protection

Expected results

The project's expected results will include:

- Development of a central database for paints, varnishes, construction materials and professional cleaning agents;
- More than 100 000 professional users will get free access to multilingual and simplified safety information;
- Training of professional users (painters, building contractors) through six workshops and nine conferences on how to use the project's web portal; how to handle safely chemicals; and appropriate waste management procedures;
- A reduction of at least 10% in injuries and accidents at work;
- Recycling or appropriate disposal of more than 1 000 packages in the first year after the project becomes operational; and
- The promotion of Eco-labeled chemical products.

BIOprocess ControlL through Online titrimetry to reduce Carbon footprint in wastewater treatment

Project background

Wastewater treatment plants (WWTPs) are designed and operated to protect the environment from polluting compounds and, when possible, to recover energy and matter (as nutrients and water for example). While most of Europe's WWTPs are currently removing biodegradable organic compounds satisfactorily, the removal of nutrients (nitrogen and phosphorus) and of toxic (or inhibiting), poorly biodegradable compounds still needs to be improved. Nutrients removal is especially important for water bodies suffering from, or at risk of exposure to, eutrophication.

Project objectives

The objectives of the project are:

- To demonstrate an innovative technology for monitoring and controlling activated sludge processes via an online measurement of the nitrification rate. An automatic control strategy will be implemented in a textile industry treatment plant for demonstration purposes;
- To identify obstacles to the diffusion of innovative technologies and to promote the application of scientifically-verified technology. A new titrimetry technology will be demonstrated using simple and reliable instruments to automatically control activated sludge processes;
- The innovative monitoring and control strategy to facilitate energy savings and improve the quality of the effluents through the control of the oxygen concentration and/or of the solids retention time in the aerobic reactors of activated sludge plants; and
- To involve public administrations in the diffusion of innovative technologies. The demonstration will take place in one of Europe's major European textile districts (Prato, Italy). This will facilitate the dissemination of the results to industrial, institutional and research actors at national and international level.

Expected results

- Demonstration of the suitability of a new technology for nitrification rate measurement and the applicability and the efficiency of an innovative control strategy for an activated sludge system;
- Installation of a prototype of an instrument based on the differential measurement of alkalinity and oxygen consumption at the end user's site, thereby allowing continuous measurement of the nitrification rate in the aerobic basin of the WWTP;

LIFE12 ENV/IT/000120
LIFE BIOCLC



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Giulio MUNZ

Duration of project:

42 months (01/09/2013 – 28/02/2017)

Total budget in euro:

1,196,584.00

EC contribution in euro with %:

594,417.00 (50.00%)

Theme: Water: Waste water treatment

- Implementation of an innovative process control strategy in one of the treatment plant's two activated sludge treatment trains, leading to better oxygen transfer efficiency (by 10-25%), effluent quality and sludge quality; Improved oxygen transfer efficiency will also lead to a reduction in electricity consumption and CO₂ emissions;
- The occurrence of nitrification inhibition phenomena will be identified immediately and their impact on the effluent in terms of nitrogen concentration will be minimised; and
- The ratio between organic and total suspended solids in the excess sludge will be maximised by reducing solids retention time and the potential biogas production of the sludge will be improved.

Increase Biodiversity through Wood Production

Project background

Thanks to European Regulation 2080/92 and to successive EU Rural Development Programmes (2000-2006 and 2007-2013), around 100 000 hectares of new forests have been planted in rural Italy over the last 20 years.

Due to a low level of knowledge of forestry management, the majority of the trees planted are broad-leaved species, which are unsatisfactory for wood production. The same problems also affected the short rotation plants (1- 2 years) for forestry biomass production; after a few production cycles have they were shown to be unsuitable, environmentally and economically.

In the mid 1990s, forestry researchers in France and in Italy began trials on poly-cycle forestry, with the aim of testing production cycles of different length on the same plots.

Results emphasised the positive effects, both in terms of wood production and the economic value of the forests, of associating on the same plots, short cycles (6-7 years), medium-term cycles (8-12 years) and long-term cycles (15-30 years).

Project objectives

The main objective of the LIFE+ InBioWood project is to increase and protect biodiversity in areas where it has been adversely affected by intensive agriculture through the creation of permanent polycyclic plantations. A new type of system will be used that combines environmental benefits, very similar to those of a forest, with the productivity benefits of commercial plantations.

Specific objectives are to:

- Increase the wood production potential of forestry plots;
- Demonstrate that polycyclic plantations can increase the economic value of the forestry arrays;
- Increase and protect biodiversity in agricultural areas;
- Improve the water management and the drainage network, applying the same implantation criteria along the forestry rows; and
- Combine environmental benefits with improved income benefits for farmers.

LIFE12 ENV/IT/000153

LIFE+ InBioWood



Beneficiary:

Type of beneficiary

Public enterprise

Name of beneficiary

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Name of contact person

Stefano DE PIETRI

Duration of project:

58 months (01/09/2013 – 30/06/2018)

Total budget in euro:

1,176,816.00

EC contribution in euro with %:

588,290.00 (49.99%)

Theme: Industry-Production: Agriculture - Fisheries

Expected results

- Increased biodiversity thanks to the presence of many primary species and many secondary plants such as bushes or small forest plants;
- Decreased use of fertiliser and pesticides in the plots management;
- Increased CO₂ sequestration thanks to the greatest number of plants per hectare;
- Improved water management and reduced water use;
- Around 2 500 hectares of demonstration plots established on open fields;
- Around 45 km of forestry rows established;
- Involvement of around 1 000 local stakeholders; and
- A best practise manual for further dissemination and application.

Promoting the use of in silico methods in industry

Project background

The EU REACH Regulation promotes a new vision for handling chemical substances. It requires information from manufacturers and/or importers confirming that chemical substances have been evaluated as safe for the intended use.

The use of non-animal alternative methods has been foreseen within REACH. In particular, the use of computational means to calculate properties of chemicals is explicitly mentioned by the Regulation, and the criteria are also defined for the so-called (quantitative) structure-activity relationship, (Q)SAR.

Presently there is a lack of experience in Europe on the use of (Q)SAR models, although they have been used for decades in regulatory processes in the United States of America.

By adopting (Q)SAR, chemical companies will not only be able to avoid producing unsafe chemicals, even before their synthesis, they will also save money and resources.

Project objectives

The LIFE PROSIL project aims to facilitate a proactive attitude amongst chemical companies about the REACH Regulation. This will help to promote a transition towards a more responsible environmental approach, and lead to reductions in health risks.

Project work will cover both existing and new chemicals, to enable the industry to take account of relevant toxicity properties right from the planning phase of chemical plants.

The main objectives include:

- Establishing a network of REACH-related laboratories for the chemical industry;
- Exploiting in silico methods for assessing particular situations of chemical substances: chemical categories and mixtures of chemicals of natural origin;
- Integrating (Q)SAR models within mainstream industrial procedures;
- Screening new chemicals to ensure they are safe;
- Exploiting methods to generate structural alerts from confidential data; and
- Producing case studies in the following industrial sectors: dyes, leather, and pesticides; and improving standardisation on the use of non-testing methods.

LIFE12 ENV/IT/000154
LIFE PROSIL



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Name of contact person

Emilio BENFENATI

Duration of project:

36 months (01/10/2013 – 30/09/2016)

Total budget in euro:

986,105.00

EC contribution in euro with %:

492,302.00 (50.00%)

Theme: Industry-Production: Chemicals

Expected results

Anticipated project outcomes include:

- A procedure to screen all compounds within a mixture of chemical compounds;
- Promotion of (Q)SAR tools, which are safe, residue-free, and environmentally benign compared to experimental methods;
- Creation of a guidance document and software for integrating the results from (Q)SAR and read across;
- A procedure for scrutinising the safety of candidate new chemicals, before their synthesis;
- A procedure for exploiting the hazard values of related compounds within a group of similar compounds;
- Development of a network of projects and initiatives applying (Q)SAR models for industry; and
- Publication of success stories from the dyes, pesticides and leather sectors.

Strategies for Marine Litter and Environmental prevention of sea pollution in coastal areas

Project background

Marine litter is a problem that affects many parts of Europe and can cause a wide spectrum of environmental, economic, health and cultural impacts. There are a variety of reasons why the phenomenon occurs, including: poor solid waste management practices; a lack of infrastructure; human activities; low levels of public awareness about the potential consequences of littering; gaps in adequate legal and enforcement systems; and a lack of financial resources.

Marine litter problems around Italy's Ligurian Sea and its shores are linked to these causes but the problem has also been exacerbated by changing weather patterns, as heavier rainfall during Spring and Autumn washes more litter into the marine environment. Biomass and wood within the litter represents a valuable source of potential fuel for renewable energy plants.

Project objectives

The SMILE project's main aim focuses on reducing and recovering marine litter in coastal areas. This will be achieved through the development of governance processes for implementing an innovative 'catching mechanism' for marine litter in a pilot area. All work will contribute to the region's ICZM operations. Specific actions will include:

- Implementation of an integrated approach to solid waste management including specific activities related to marine litter in waste management strategies;
- Extension of existing ICZM operations further inland;
- Standardisation and harmonisation of related monitoring programmes;
- Development of governance processes, at local and regional level, for promoting more shared policies and actions in coastal areas;
- Implementation of a catching mechanism to reduce and prevent the transport of solid wastes from river basins, including a cost/benefit analysis of the system; and
- Raising the awareness of environmental stewardship amongst sea and coastal users in order to improve the efficacy of existing law and regulations in addressing marine litter problems.

Expected results

Anticipated outcomes from the project's actions include:

- Introduction of a monitoring protocol for marine litter from beaches and shallow waters;

LIFE12 ENV/IT/000289
LIFE SMILE



Beneficiary:

Type of beneficiary

Regional authority

Name of beneficiary

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Ilaria FASCE

Duration of project:

36 months (01/07/2013 – 01/07/2016)

Total budget in euro:

1,186,944.00

EC contribution in euro with %:

570,958.00 (48.16%)

Themes: Land-use and Planning: Sensitive and protected areas management / Waste: Waste reduction - Raw material saving

- Collation of survey data from the pilot area about beach and benthic litter. The survey will also provide valuable information about stakeholders' perceptions of marine litter in the pilot area;
- Publication of an overview of good practices about waste management and marine litter prevention;
- A draft outline for a methodology of governance processes;
- Preparation of guidelines for local waste management, supported by a related web-based GIS tool;
- Launch of a web and mobile app-based reporting platform on marine litter;
- Implementation of an innovative litter trap system; and
- Publication of a cost-efficiency report about the litter trap system.

FIBERS INNOVATIVE BURNING AND REUSE BY SHS

Project background

Following the decision to ban the use of asbestos in construction, the question of what to do with increasing amounts of fibre-bearing waste has become an environmental priority. Several methods have been proposed for the disposal of materials containing asbestos (complete removal, insulation by resin coating or encapsulation). Techniques for making asbestos inert include fluorosulphonic acid attack, thermal treatments and mechanochemical methods. However, encapsulation and coating are temporary solutions, as the material is still subject to weathering. Moreover, fibre treatments based on chemical attack are liable to release toxic vapours. In Europe, active inerting plants are based on thermal treatments or on plasma technology. In Italy, most asbestos-containing waste is considered as hazardous, but waste dump capabilities are decreasing and new sites are difficult to identify. Thus, the alternative solution at the moment is incineration, mostly abroad, at a very high cost.

Project objectives

The LIFE FIBERS project aims to improve knowledge on the treatment of asbestos-bearing waste through the following actions:

- Manufacturing and implementing two prototype ovens (which will be up-scaled to medium and then to pre-industrial scale), dedicated to inerting asbestos-bearing waste by a technique known as 'self-propagating high temperature synthesis' (SHS);
- Verifying the extent of transformation of fibrous waste into newborn minerals, with changed chemistry and behaviour from asbestos;
- Optimising the quality (i.e. purity) and the amounts (i.e. the stoichiometry) of chemical reagents to be adopted for the industrial extension, as a part of a move towards green and sustainable industrial processes;
- Conducting further industrial applications of inerting by SHS for other harmful fibrous waste; and
- Assessing the re-use of the granular silicates (mostly olivine, Mg_2SiO_4), the end products of the SHS inerting, as secondary raw materials.

Expected results

The project expects to achieve the following results:

- Start up of a permanent prototype plant located at partner, Vico s.r.l.;
- Demonstration of the feasibility of a mobile plant for in-situ remediation of tiles, plaster or insulation

LIFE12 ENV/IT/000295
LIFE FIBERS



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Name of contact person

Laura GAGGERO

Duration of project:

36 months (01/07/2013 – 01/07/2016)

Total budget in euro:

1,543,367.00

EC contribution in euro with %:

769,769.00 (50.00%)

Themes: Industry-Production: Non-metallic minerals / Waste: Hazardous waste

material, thereby helping to reduce remediation costs and decrease landfill demands;

- Both prototypes will test the breakdown of i) pure asbestos, ii) asbestos bearing-waste and iii) other asbestos fibrous waste;
- Gaining of useful knowledge regarding the industrial quality of combustion products and potential areas of re-use; and
- Results from the tests are anticipated to offer improved cost effective treatment options in terms of time and energy.

Overall findings will help to update normative protocols for waste treatment at national and transnational levels.

High Pressure Resination System

Project background

The woodworking industry accounts for nearly 2% of manufacturing added value in Europe, according to the European Panel Federation. In the engineered wood (EW) segment, a wide range of products is processed and used in many applications, from construction to assembly of furniture. The EW category includes a number of panel types, such as particleboard (PB), medium density fibreboard (MDF), plywood and oriented strand board (OSB). The blending process in the production of these products is a critical manufacturing phase in which resins are used to bind the different types of wood fibre. Currently, the blending process in wood panel manufacturing has an energy consumption of 6 kWh per m³ of wood panel produced per year. Energy is also used in the production of resins – approximately 0.86 kWh per kilogramme of urea-formaldehyde resin. These resins also emit hazardous formaldehyde.

Project objectives

The project aims to reduce resin usage in the panel-production industry. The main objectives are to:

- Demonstrate the environmental, economic and technical benefits of introducing new mechanical technologies that are able to distribute resin particles with a greater efficiency compared to the current blending technologies on the market; and
- Achieve a reduction in resin usage in the panel-production industry by demonstrating an EW panels production line that uses up to 10% less resin for each m³ of panels. The reduction in resin use will also generate a consistent 5% energy saving in the MDF drying process and 15% energy saving in the blending process.

Expected results

- Design and implementation of a fully functional pilot line that conforms to all energy consumption and safety standards required by European and national laws;
- Manufacturing of three batches of 500 m³ wood panel prototypes, which will be tested according to the life-cycle assessment ISO 14040:2006 and 14044:2006 standards;
- A 10% reduction in emissions of volatile substances for each m³ of panels;
- A 15% reduction in energy consumption in the blending process and a 5% reduction in energy consumption in the MDF drying process;

LIFE12 ENV/IT/000307
LIFE HPRS



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Lauro ZOFFOLI

Duration of project:

30 months (01/07/2013 – 31/12/2015)

Total budget in euro:

1,470,223.00

EC contribution in euro with %:

735,111.00 (50.00%)

Theme: Industry-Production: Wood – Furniture

- Validation of the pre-pilot line; and
- Validation of the prototypes.

Biomethane Emilia-Romagna

Regional system

Project background

The transport sector accounts for 19.5% of total EU greenhouse gas (GHG) emissions (22.9% in Italy). Counter to the general EU trend, GHG emissions from transport have increased by 24% compared to 1990 levels, with road transport responsible for most of the rise. The replacement of fossil fuels with biofuels could be one way of changing this trend. More specifically, the production of biomethane would allow waste to be used as a source of transport fuel. However, waste management currently represents a cost for public administrations (collection, separation, treatments and storing) and for communities in terms of health and environmental threats. The economic and environmental costs of waste management could thus be offset through the production of biomethane from landfill biogas or from the organic fraction of municipal solid waste.

Project objectives

The project will set up two demonstration plants at Mancasale and Ravenna for biomethane production from waste. The plants will treat both biogas from landfill and biogas from anaerobic digestion of sludge from wastewater treatment. The plants will be connected to the transport fuel system so that the biomethane can be used for vehicle fuel; remaining energy generated by the plants will be burnt to generate heat or power.

The project will be innovative, combining established technologies (such as anaerobic digestion) with new technologies, in particular the use of a membrane technology to improve the quality of the biomethane, so that it contains more methane and less carbon dioxide than the biogas derived from landfill. This upgrading increases the energy value of gas and consequently the distance that a vehicle can drive with a given volume of gas.

Through its actions, the project will contribute to the reduction of GHG emissions by replacing a portion of fossil fuels (natural gas) with an equal amount from renewable energy sources (residual biomass), and it will reduce the environmental impact of waste management. The experience from the project will be promoted as widely as possible within Italy, and the project will also establish a European Biomethane Technical Committee that will exchange information with interested organisations from other countries.

LIFE12 ENV/IT/000308

BioMethER LIFE+



Beneficiary:

Type of beneficiary

Development agency

Name of beneficiary

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Stefano VALENTINI

Duration of project:

54 months (01/10/2013 – 31/03/2018)

Total budget in euro:

3,375,465.00

EC contribution in euro with %:

1,529,310.00 (48.50%)

Theme: Climate change – Energy: Energy supply -
Reduction of greenhouse gases emissions

Expected results

- The pilot plants will treat, respectively, raw biogas with 70% and 55% methane content, and will upgrade it to biomethane with methane content above 90%. Most of the biomethane will be used for vehicle fuel; the remainder will be used for power or heat generation;
- The plants are expected to produce 730 000 m³ biomethane/year, the use of which will reduce CO₂ emissions by 2 100 tonnes compared to natural gas;
- The production and sale of biomethane will reduce the cost of waste management for public authorities. Anaerobic digestion of municipal solid waste reduces the environmental cost by reducing the bacterial load of the waste and by making it more stable; and
- The production of guidelines will support the regional government of Emilia-Romagna in designing the policy for the development of biomethane and will help quantify and qualify the impacts of the biomethane production lifecycle.

Anti-infective environmental friendly molecules against plant pathogenic bacteria for reducing Cu

Project background

The control of bacterial diseases in plants is largely based on the use of copper salts, which are some of the few chemicals still allowed in organic agriculture. However, copper derivatives do not degrade in the environment and their tendency to accumulate in soil and water poses a serious threat to a wide range of organisms and micro-organisms, and to their ecosystems. Moreover, copper-contaminated agricultural soils have been shown to contain high proportions of antibiotic-resistant bacteria in comparison with non-contaminated soils. Therefore copper-contaminated soils should be considered a dangerous reservoir of genes for antibiotic resistance, easily transmitted to pathogenic bacteria infecting animals and humans, with a significant impact on their health. The replacement of copper with more favourable alternatives is a priority for European agricultural policy. Surprisingly, no copper-free substitutes for copper fungicides have so far been found, though some preparations appeared to have potential. This research needs to be further investigated and built on, however.

Project objectives

The overall goal of the After-Cu project is to demonstrate the environmentally friendly and anti-infective properties of innovative peptide molecules against plant pathogenic bacteria, with a view to substituting the peptide molecules for traditional copper compounds that are used in conventional and organic agriculture.

The project will also:

- Demonstrate the in vitro and in vivo efficacy of anti-infective peptides as a replacement for copper compounds, through optimised field treatments on several plants (olive, kiwi fruit and citrus); and
- Contribute to the protection of the environment by reducing the substantial pollution that arises because of the accumulation of copper as a result of its use in plant disease management.

Expected results

- An 80-100% long-term reduction of copper pollution in agricultural soils thanks to their substitution with the anti-infective peptides;
- A 70% improvement in soil fertility as a result of the reduction in/replacement of copper compounds;
- Better control of bacterial plant diseases;
- A 65% increase in soil microbial diversity with a positive impact on soil biology and on the transformation of nutrients;

LIFE12 ENV/IT/000336

Life After-Cu



Beneficiary:

Type of beneficiary

University

Name of beneficiary

Università di Firenze - Department of Agricultural Biotechnology

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Stefania Tegli

Duration of project:

24 months (01/01/2014 – 31/12/2015)

Total budget in euro:

1,282,930.00

EC contribution in euro with %:

641,465.00 (50.00%)

Themes: Industry-Production: Agriculture – Fisheries / Risk management: Industrial risks - Hazardous substances

- A long-term reduction of 90% in copper pollution in watercourses;
- An 80% reduction of the toxicological impact of copper pollution on terrestrial, aerial and aquatic fauna;
- A 100% reduction of copper residues in fruit and vegetables;
- A short-term reduction of 85% in copper and antibiotic-resistant bacteria at agricultural sites;
- A long-term reduction of 60% of the reservoir of environmental antibiotic-resistant bacteria and of their spread, with a subsequent reduction of the risks to human and animal health;
- A 20% reduction in the consumption of energy used for remediation of copper-contaminated soils; and
- An 80% reduction in the use of chemical additives in biotechnological synthesis of the anti-virulence peptides, in comparison with conventional chemical processes.

Naturalised dyes replacing commercial colorants for environmentally friendly leather dyeing and water recycle

Project background

The core activity of the leather industry has expanded in recent years following the availability of a wider range of dyeing products from dyestuff manufacturers. An estimated 2.3 million tonnes/yr of dyestuff are produced globally. This dyestuff is often chemically complex and heterogeneous in nature, which can present environmental hazard risks. Dyeing effluents released into wastewater may contain up to 50% of the dye used to set dye baths. Therefore, commercial dyes can constitute a significant source of heavy pollution.

Elimination of contaminants from the leather industry's dyeing effluents is thus an important environmental objective. The challenge is especially pertinent in Italy and Spain, the EU's two largest leather industries, which produce some 235 000 tonnes/yr of leather goods.

Project objectives

The Life BioNaD project's main objective was to demonstrate the economic and environmental performance of innovative dyes for the leather industry. These 'naturalised dyes' provide an alternative to conventional methods (that commonly rely on acid dyes). The project will also test bacteria-based degradation processes on dye effluent wastewater, enabling it to be recycled and thus reducing water consumption.

Specific project actions will demonstrate:

- The synthetic chemical design of dyes in compliance with EU REACH Regulation (CE) No. 1907/2006;
- The use of lactose from waste milk serum to generate naturalised dyes;
- The use of naturalised dyes with a higher purity than commercial acid dyes;
- The avoidance of chemical additives in the dyeing processes; and
- The use of eco-friendly *Escherichia Coli* biodegradation technology to achieve the purification of dye-containing effluents in aerobic conditions without the generation of toxic metabolism by-products;

Expected results

- Total elimination of chemical additives as dispersing agents and surfactants from the synthesis output of dyes;
- A 100% increase in the purity of naturalised dyes in comparison with commercial dyes;
- An 80-100% reduction in the release of lactose from waste milk serum into the environment;

LIFE12 ENV/IT/000352

Life BioNaD



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

Chemical Institute of Organometallic Compounds of CNR

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Name of contact person

Emilia BRAMANTI

Duration of project:

30 months (01/01/2014 – 30/06/2016)

Total budget in euro:

1,469,056.00

EC contribution in euro with %:

725,713.00 (49.40%)

Theme: Industry-Production: Leather and Footwear

- A 70-100% reduction in pollutants in dyeing wastewater;
- A 70-100% increase in the biodegradability of dyeing wastewater;
- Recycling of 100% of bacteria biomass for further wastewater purification;
- A 20% increase in penetration of naturalised dyes into leather;
- A 20% increase in efficacy for dyeing homogeneity;
- A 10-15% increase in bath exhaustion;
- A 15-20% improvement in the quality of dyed leather using finishing protocols;
- A 50% improvement in the purification of dyeing effluents using *E. Coli bacteria*;
- A 40-50% reduction of the COD and BOD of dyeing wastewater;
- Recycling of 70-80% of purified wastewater (e.g. for further dyeing);
- A 40-50% reduction in water consumption; and
- A 20-30% reduction in energy consumption.

Innovative fertiliser from urban waste, bio-char and farm residues as substitute of chemical fertilisers

Project background

Agriculture based on the use of fertilisers accounts for 40-60% of the world's food supply. The main nutrients – nitrogen (N), phosphorus (P) and potassium (K) – are elements that occur naturally in the environment but are removed with the harvesting of crops. Fertilisers replenish the soils with N, P, K and other nutrients, thereby helping to sustain ongoing food production. The world market of chemical fertilisers is extremely large, but it has a heavy impact on the environment.

The need to protect the biological characteristics of the soil has to be considered as an important environmental challenge. The scale of this challenge increases according to the length of the time (usually years) that chemical fertilisers have been applied. Chemical fertilisers are very effective in the short term, but need a suitable supplement of natural organic substances. Often, the factor that limits the wider use of organic fertilisers is the difficulty in correctly managing the maturing process of the raw materials. As a result, the final product has a poor agronomic quality.

Project objectives

The main objective of the LIFE RESAFE project is to demonstrate the production and effective use of reduced salinity fertilisers (RSF) as a step towards replacing chemicals and mineral fertilisers through a technological route based on urban organic waste (UOW), bio-char and farm organic residues (FOR).

Based on this approach, it will be possible for farmers and urban waste managers to reduce costs and benefit economically from material recovery (e.g. reduced quantities of waste sent to landfill and the related costs saving). They will also benefit financially from the use of these organic fertilisers. The environmental impact will also be significant, due to the decrease in greenhouse gas emissions from landfills and to the benefits for soil structure and fertility.

The use of the RSF will have the following advantages:

- A significant reduction in the systematic use of chemical fertilisers;
- A consistent improvement in soil health and fertility;
- Increased availability of nitrogen and phosphorus for plants; and
- Increased "suppressive soil potential" against soil pathogens.

LIFE12 ENV/IT/000356
LIFE RESAFE



Beneficiary:

Type of beneficiary

University

Name of beneficiary

Sapienza Università di Roma - Dipartimento
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Name of contact person

Silvia SERRANTI

Duration of project:

24 months (01/01/2014 – 31/12/2015)

Total budget in euro:

1,354,887.00

EC contribution in euro with %:

672,023.00 (49.60%)

Theme: Waste: Municipal waste (including household and commercial)

Expected results

Process improvement:

- Demonstration of a process for maximising nitrogen retention in fertiliser;
- Demonstration of a composting process that strengthens humification (increased by 20%); and
- Demonstration of a composting process that enhances sanitation.

Product improvement (RSF):

- Well-humified organic matter that has a positive impact on soil;
- Higher nitrogen, phosphorus and potassium content (than mineral fertilisation) – by up to 3%;
- Reduced salinity; and
- Higher water retention when mixed with soil (up to a 30% reduction in water consumption during crop harvesting).

Innovative plastic pollutants removal for efficient recycled wood panels production

Project background

Currently, medium-density fibreboard (MDF) panels are mainly obtained from virgin wood and only a small number of producers use post-consumer recycled wood (some 10%, according to a study carried out by the project beneficiary). A number of factors currently limit wider use of recycled wood, including:

- The inefficiency and complexity of the process of removing impurities (multiple steps);
- The low-quality of MDF panels made from recycled wood and the fact that they are not compliant with the EPF Standard and EN 622-5; and
- The lack of effective systems for removing impurities.

Project objectives

The project will demonstrate the viability of an energy-efficient pilot plant that is able to finely separate post-consumer recycled wood from plastic impurities to enable its use, firstly, in manufacturing MDF panels and, secondly, as 'purified' biomass.

Project actions will involve the implementation of a system to produce more sustainable and affordable MDF panels containing up to 60% of post-consumer recycled wood, and which is compliant with EN 622-5 and EPF Standards. The 'purified' post-consumer wood products will be suitable as biomass for energy production and have a reduced dioxin level during combustion. Other benefits from the new process will include a reduction in the use of virgin wood, (supporting non-deforestation agendas) and a prolongation of the lifecycle of recycled wood (reducing landfill demands). New job opportunities from the process will become more likely following its validation as a commercially viable business venture.

Expected results

- Development of an energy-efficient pilot plant, replicable on a modular scale in other EU companies that can clean post-consumer recycled wood, removing up to 95% of plastic impurities. 'Purified' wood outputs will be used primarily to produce high-quality MDF panels and secondarily as biomass to produce energy;
- Reduction of virgin wood usage, limiting de-forestation and prolonging the recovered wood lifecycle. In the proposed demonstration, the pilot plant will replace 60% of virgin wood with the 'purified' wood (some 78 tonnes/day), which corresponds to 9 600 fewer trees per year cut from EU forests, sequestering approximately 88 tonnes of CO₂ per day;

LIFE12 ENV/IT/000374

Life Plastic Killer



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Name of contact person

Giuseppe PINESE

Duration of project:

48 months (01/07/2013 – 30/06/2017)

Total budget in euro:

1,874,423.00

EC contribution in euro with %:

880,818.00 (49.78%)

Themes: Industry-Production: Building / Waste: Waste recycling

- Increase the percentage of recycled wood in MDF panels from the current 5-10% up to 50-60%. This will lead to the mobilisation of 3.5 million tonnes of post-consumer recycled wood in Europe, with an economic saving of some €105 million, assuming a conservative estimation of 30 €/tonnes of savings, when the costs of virgin wood purchase, logistics and industrial processes are taken into account;
- Using the 'purified' wood as biomass will mean a 1% reduction of dioxin emissions from plastic combustion;
- Demonstration of the project concept as replicable, modular and scalable, providing an affordable and sustainable business model for replication after the LIFE funding period. A lifecycle/cost analysis and socio-economic assessment will be produced to support and bolster this result; and
- Supporting the creation of efficient recovery and recycling circuits and markets for post-consumer wood, through increased transparency and implementation of better links among wood users and the recovery circuits.

Product Environmental Footprint Enhanced by Regions

Project background

The Global Ecological Footprint tracks the area of biologically productive land and water required to provide the renewable resources that people use, including the space needed for infrastructure and vegetation to absorb carbon dioxide (CO₂). It shows that the global economy is having an increasingly greater impact on the environment. In 2007, this footprint exceeded the Earth's biocapacity — the area actually available to produce renewable resources and absorb CO₂ — by 50%, a doubling of the footprint in the last 50 years.

The need for sustainable consumption and production policies has been demonstrated from various perspectives at EU level. The Product Environmental Footprint (PEF) was initiated with the aim of developing a harmonised European methodology for environmental footprint studies that can accommodate a wide range of relevant environmental performance criteria using Lifecycle Assessment (LCA).

Project objectives

The LIFE PREFER project aims to demonstrate the effectiveness of the European methodology for environmental footprint in different sectors using the cluster approach, in order to overcome the typical drawbacks affecting SMEs (lack of human and financial resources). It will develop and strengthen this approach based on shared resources. The project will provide an opportunity for innovative environmental governance on the possibility to facilitate knowledge-sharing and experience exchange among participants and encourage the application of the PEF methodology. At the cluster level, a set of instruments, tools and resources will be shared with local SMEs in order to support them in the application of the PEF methodology and to achieve improvements in environmental performance. The effectiveness and uniqueness of the project lies in using the clustering methodology in an innovative way – i.e. to define and implement a policy and governance approach aimed at increasing the uptake PEF among SMEs.

Expected results

- At least 18 PEF/LCA experiences analysed;
- Eight pilot groups with at least 25 organisation involved;
- At least seven products selected;
- At least eight PEF assessments performed, one for each cluster;
- At least eight PEF reports;

LIFE12 ENV/IT/000393
LIFE Prefer



Beneficiary:

Type of beneficiary

University

Name of beneficiary

Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna

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Name of contact person

Chiara CARROZZA

Duration of project:

39 months (01/10/2013 – 30/12/2016)

Total budget in euro:

1,541,845.00

EC contribution in euro with %:

770,922.00 (50.00%)

Theme: Environmental management: Life Cycle Assessment-Management

- At least eight drafts of PEF category rules;
- 80 SMEs interviewed;
- At least four different tools to develop PEF;
- 48 SME representatives trained;
- Three EU clusters involved;
- Involvement of at least 30 representatives of foreign clusters (10 for each cluster);
- At least three SMEs from each cluster to test the PEF methodology;
- At least two SMEs from each cluster to implement improvement actions on environmental performance;
- At least one impact category in each SME registering an improvement of around 5% after the implementation of actions;
- Increase in environmental indicators (2-5%);
- Increase in investments by companies in socio-economic aspects such as training activities (2-3%); and
- Increase in socio-economic indicators selected to assess the project impact (2-5%).

Reduction of greenhouse gases from agricultural systems of Emilia-Romagna

Project background

Italy's agricultural sector is considered to be responsible for producing 35% of the country's methane and 45% of its nitrous oxide greenhouse gas (GHG) emissions. There is a link between intensive agricultural activities and the level of these emissions. Much of Emilia-Romagna's agricultural output is focused on producing high-quality food, such as Parmigiano Reggiano cheese (a Protected Designations of Origin product); Protected Geographical Indications peaches and pears, as well as labelled beef and fresh milk produced in environmentally friendly integrated farms. A green policy on GHG emissions could further improve the sustainability of these local agricultural production systems.

Project objectives

The LIFE+_Climate changE-R project aims to help to reduce GHG emissions caused by selected agricultural food chains on a regional scale. It will tackle emissions of methane (CH₄) from enteric origin, nitrous oxide (N₂O) from soil and manure and carbon dioxide (CO₂) from energy use. The general aim is to reduce the emissions by 200 000 tonnes CO₂ equivalent over a three-year period in specific food production sectors (tomato, green bean, wheat, peaches and pears) and in the beef and milk production chains. Best Practices will be tested and assessed through an open governance process involving stakeholders and policy-makers. Analysis of the best practices will include an assessment of the impact of the GHG reduction measures on agricultural productivity.

Expected results

- A 3% reduction in GHG emissions from agriculture compared to the current trend (equivalent to a cut of 300 000 tonnes CO₂ eq/yr, assessed for Emilia-Romagna from the 1990-2009 trend of the national inventory);
- Development of Best Practices for mitigating agricultural GHG emissions through techniques and means that are effective in reducing the release in the atmosphere of CH₄ of enteric origin and from manure; N₂O from soil and manure; and CO₂ from energy use, as well as in improving soils' carbon sequestration;
- Mitigate climate change through lessons learnt. Relevant governance practices will be applied in the forthcoming regional Rural Development Plan 2014-2020; and
- Transition towards a low carbon emissions economy in agriculture, thanks to: dissemination of the project

LIFE12 ENV/IT/000404
LIFE+_Climate changE-R



Beneficiary:

Type of beneficiary

Regional authority

Name of beneficiary

Regione Emilia Romagna - Direzione Generale Agricoltura, Economia Ittica, Attività Faunistico-Venatorie

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Name of contact person

Mario MONTANARI

Duration of project:

42 months (01/07/2013 - 31/12/2016)

Total budget in euro:

1,853,900.00

EC contribution in euro with %:

891,950.00 (48.11%)

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Industry-Production: Agriculture - Fisheries

results amongst agriculture operators, citizens and consumers; and demonstration of the Best Practices to stakeholders and policy-makers at European, national and local levels.

Enhanced Material Recovery and Environmental Sustainability for Small Scale Waste Management Systems

Project background

In the EU, gaseous emissions from waste landfills are responsible for 3-13% of the Member State anthropogenic greenhouse gases (GHG) emissions. Biodegradable waste, however, can also be an important resource for renewable energy production; it could be possible to exploit it as a fuel in anaerobic digestion facilities of waste-to-energy plants, or as a fuel for transport/collection vehicles. In both cases, the biochemical potential of the biodegradable waste can be converted into renewable energy. Furthermore, bioreactor landfills can also be an efficient and sustainable solution. With an alternating sequence of aerobic/anaerobic phases, it is possible to reduce GHG from landfills, as well as increase energy recovery efficiency from the landfill gas.

Project objectives

The LIFE EMaRES project focuses on the problem of waste management in those areas that have no incineration facilities, and where residual waste is managed mainly by mechanical biological treatment (MBT) and landfill. The aim is to demonstrate the potential to increase material recycling and recovery, while reducing landfill needs through innovative concepts in waste collection, mechanical sorting, biological treatment and landfill management. Project activities involve the whole waste management system, including source segregated (SS) collection, recycling, MBT and final disposal. Specific objectives are to:

- Increase the amount and quality of waste collected in an SS way;
- Increase material recycling by improving the selection efficiency and effectiveness of the mechanical sorting section of an existing MBT plant;
- Improve the aerobic biological section of an existing MBT plant by introducing preliminary anaerobic digestion treatment; and
- Decrease the environmental impact of landfill and the amount of waste disposed.

Expected results

Source Segregated collection:

- Increased quality of SS collected waste by reducing the amount of impurities from the current 9% to no more than about 5%;
- Increased glass recycling to almost 90%;
- Improved paper and cardboard quality for direct use in the paper industry;
- SS collection of 80% of used cooking oil to be used as fuel; and
- Development of an energetic, environmental and economic tool able to support policy decisions in waste management.

LIFE12 ENV/IT/000411
LIFE EMaRES



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Name of contact person

Francesco DI MARIA

Duration of project:

30 months (02/12/2013 - 01/06/2016)

Total budget in euro:

1,352,107.00

EC contribution in euro with %:

657,258.00 (48.61%)

Theme: Waste: Waste reduction - Raw material saving

Mechanical Sorting (MS) efficiency:

- Increase of at least 20% in the amount of recyclable materials; and
- Improvement in the MS section dedicated to the treatment of mixed residual waste by achieving an increase of at least 20% in the recycled and recovered fraction from residual waste.

Biological treatment section:

- A self-sustainable energetic biological treatment section;
- Energy consumption of the existing aerobic treatment section reduced by 15%; and
- A 20% increase in the amount of high-quality organic fertiliser produced.

Bioreactor landfill:

- Mass of waste disposed per unit volume increased by 50%;
- Biogas and biomethane production period reduced by 50%;
- Leachate-polluting load reduced by 50%; and
- Sustainable emissions level for landfill sites achieved in seven years.

Minimise the water footprint of the impactful H₂O waste in the cutting cycle of natural stone blocks

Project background

Quarries for the extraction of marble and natural stone are widespread across Europe. But the extraction and cutting of stone are still carried out by traditional methods, which involve the slow removal of material using large cutting disks and vast quantities of water. A considerable amount of sludge is also produced and disposed of as waste in landfill.

In Europe, about 1 800 000 stone blocks are extracted each year, which corresponds to the loss of about 1.98 billion litres of water. Furthermore, this figure does not seem to be decreasing. In fact, problems related to the consumption of water and to the production of sludge and wastes were recently highlighted by the media and are now the focus of European environment legislation.

Project objectives

The main objective of the project is to drastically reduce water consumption during the cutting of natural stone, and in particular during the cutting process of pietra serena (a type of sandstone). The project will demonstrate a new cutting tool, equipped with small micronising nozzles that inject the pressurised water exactly into the contact area between the blade teeth and the sandstone. Two positive effects are expected: the required cooling of the metallic blade and the removal of the abraded powders in a form of dense slurry.

Due to the blade's higher resistance to wear, the pietra serena abraded particles will be smaller in size, which will make them easier to recycle in other manufacturing processes related to the pietra serena sandstone, such as in the formulation of sealants and adhesives for pietra serena installation. Thus, the new process aims to save water and to produce recyclable powders, as well as improving working conditions by reducing the amount of sprayed water and avoiding the creation of local micro-climates due to the high moisture content.

Expected results

The main expected result of the project is to demonstrate the feasibility of extracting large blocks of stone and marble with a technique that drastically reduces the use of water. This will be achieved through the operation of a pilot plant that will serve as a basis for the subsequent transformation of all the company's cutting equipment, and as an example for other companies that want to replicate the system. The project will result in

LIFE12 ENV/IT/000419
LIFE of water is man life



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Name of contact person

Stefano CANGIOLI

Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

1,206,612.00

EC contribution in euro with %:

603,306.00 (50.00%)

Themes: Industry-Production: Mining – Quarrying /
Water: Water saving

the reduction of water consumption by about 550 litres per cut block (the company processes 2 000 blocks/year) and of water usage from the current average of 20 000 litres to less than 4 000 litres. Moreover, the use of reduced section blades with a width of 8 mm will improve the efficiency of the use of raw materials (37 cuts per block rather than 35) and reduce the generation of waste (0.55 m³ compared to the current 0.68 m³ per block). The new process will also allow for the recovery of waste (powders) which is suitable for use in sealants, adhesives, inert decorating material, ceramic tiles and sintering additives. The estimated reuse of abraded powders after compression is 100%.

Petrol based Glue and Energy consumption reduction in diapers production processes

Project background

Bonding processes are important for the production of many consumer products, including absorbent hygiene products (AHP). Bonding processes normally involve glue. The production of nappies in the European Union uses more than 30 000 tonnes/yr of glue. This is estimated to be responsible for an environmental footprint of more than 200 000 tonnes of CO₂ equivalent. Furthermore, some 1 269 Twh/yr of energy is consumed by nappy manufacturing, and gluing is one of the most energy-intensive sub-processes. Finally, disposal of post-consumer AHP generates, in Europe alone, more than six million tonnes/yr of AHP waste that is currently landfilled or incinerated. Worldwide, disposable absorbent products and nappies represent about 4% of solid waste and about 2% of all waste sent to landfill. Landfilling and incineration cause air, water and soil pollution.

The environmental impact of AHP production should therefore be tackled by reducing use of petrochemical-based materials, by reducing the energy intensity of AHP manufacturing and by cutting pollution from AHP waste.

Project objectives

The LIFE GLUELESS project will demonstrate that a significant reduction in the environmental impact of AHP can be achieved through a drastic reduction in the use of glue in the production process. Gluing can be replaced by novel combinations of thermo welding and ultrasonic bonding, which promise reductions of 65% or more in the use of primary non-renewable materials (petrochemical-based glue), and significant energy and cost reductions.

The project's main objectives are:

- To convince AHP producers to adopt a cost-effective (and environmentally friendly) alternative bonding solution by demonstrating that it meets performance criteria; and
- To underpin via an industrial demonstration project (including dissemination to multiple industry sectors) public environmental policy objectives of decoupling environmental impact from economic growth, and implementing the no.1 priority in the waste hierarchy: waste avoidance.

Expected results

The project expects to achieve the following technical, environmental and economic outputs:

LIFE12 ENV/IT/000423
LIFE GLUELESS



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

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Name of contact person

Francesco D'APONTE

Duration of project:

42 months (01/07/2013 – 31/12/2016)

Total budget in euro:

3,079,493.00

EC contribution in euro with %:

1,443,124.00 (49.69%)

Themes: Environmental management: Cleaner technologies / Industry-Production: Paper - Pulp – Printing

- Demonstration of new combinations of thermal welding and ultrasonic technologies to replace current gluing processes in five sub-processes;
- Production of a demonstration nappy using the novel bonding technologies; the demonstration product will have equivalent performance to current products, but will use 65% less glue;
- A 10% energy saving from the reduction in the use of glue and the implementation of less energy-intensive processes; and
- An assessment of the financial savings secured by reducing the use of glue. Assuming the cost of 1 kg of glue is €3.50, for an average manufacturing facility savings could reach €500 000/yr.

Zero Emission Firing strategies for ceramic tiles by oxy-fuel burners and CO₂ sequestration with recycling of byproducts

Project background

Carbon dioxide emissions and the low energy efficiency of current firing techniques for ceramic tiles have a negative impact on the environment. When firing tiles, CO₂ is released due to the oxidation of natural gas. The amount of CO₂ produced per unit mass of finished product ranges from 90 to 125 g/kg in the case of single firing, and up to 140 g/kg in the case of 'porcelainised' stoneware. Moreover, since air is used as a source of oxygen in the burners, large quantities of nitrogen are introduced to the firing kiln and NO_x are generated. Such emissions range from 6 mg/kg of porcelainised stoneware to 413 mg/kg of single firing red body tiles.

Project objectives

The objective of the LIFE ZEF-tile project is to demonstrate the feasibility of applying oxy-fuel technologies to the firing stage of ceramic tile production in order to facilitate CO₂ sequestration. By using pure oxygen to burn hydrocarbons such as methane, the exhaust gases will contain only CO₂ and water vapour. As a result, it will no longer be necessary to heat the inert gases contained in air. Moreover, it will lead to a reduction in the volume of exhaust gas, which can then be processed easily due to its simple composition.

The project will set up a demonstrative roller kiln with burners modified in order to use pure oxygen. Water vapour will be condensed in order to leave a stream of almost pure CO₂, which will then be subjected to sequestration techniques. The project team will assess the effect of using part of the CO₂ flux to boost plants and vegetable growth in a greenhouse, and will compress and store another part in liquid form to be used in different ways.

A further objective will be to speed up the firing curve of the emerging thin tiles and glass-based materials through the use of higher flame temperatures.

Expected results

- An innovative zero emission firing process for ceramic tiles;
- Direct recycling of 100% of the gas processing by-products of ceramic tile production as milling or glazing water, and as carbonates for ceramic body composition;
- Zero particulate emissions, due to the ideal combustion conditions in the oxy-fuel burners and to the installation of ash filters;

LIFE12 ENV/IT/000424

LIFE ZEF-tile



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Name of contact person

Arturo GHINI

Duration of project:

30 months (01/07/2013 – 31/12/2015)

Total budget in euro:

1,256,701.00

EC contribution in euro with %:

593,475.00 (50.00%)

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Industry-Production: Non-metallic minerals / Waste: Waste reduction - Raw material saving

- A 75% reduction in the circulating mass and volume of the flue gas;
- Reduced heat losses from exhaust gases;
- Condensable flue gases (CO₂ and H₂O), making compression separation possible;
- A 95% reduction in the production of NO_x by using technically pure oxygen; and
- An evaluation of the investment costs (expected to be 50% higher), and energy and running costs, and a comparison with the environmental benefits in order to assess the cost of CO₂ sequestration.

Green hydrolysis conversion of wool wastes into organic nitrogen fertilisers

Project background

Coarse wool from EU sheep farming and slaughter is essentially a valueless by-product that cannot be used for textile application. However, since sheep shearing (necessary for the animals' well-being) generates some 200 000 tonnes/yr of coarse wool, this waste material could potentially offer a significant economic opportunity.

Each tonne of raw wool contains approximately 150 kg of lanolin (wool wax), 40 kg of suint (soluble contaminants such as potassium salts from sweat and faeces), 150 kg of dirt (soil), 20 kg of vegetable matter, and residues of insecticides, leaving 640 kg of wool fibre. Insecticides or insect growth regulators (IGR) are used to protect sheep from ecto-parasites (lice, mites, blowfly, etc.); their presence in wool is variable and depends on the permitted legal use pattern in each country.

Factory or industrial 'scouring' consists of the immersion of the greasy wool in a series of baths of warm water (about 50°C), soap and sodium hydroxide (soda) or potassium hydroxide (potash) and is one of the recommended procedures for eliminating the foot-and-mouth disease (FMD) virus present in the wool. The effluent discharged from wool scouring contains high concentrations of the following: soil particles picked up by the sheep during grazing; lanolin and sweat (the source of potassium) produced by the sheep; additives used in the scouring and related processes such as detergent residues; and pesticide residues.

The resulting chemical oxygen demand (COD) reaches 100 000 mg/l and the biochemical oxygen demand (BOD) varies from 20 000 to 40 000 mg/l. This makes the disposal of the sludge generated by the effluent treatment very difficult to manage.

Project objectives

The overall objective of the LIFE+ GREENWOOLF project is to demonstrate the viability of converting waste wool into fertiliser using small-scale, local hydrolysis plants. The process will reduce transportation costs and eliminate the need for the scouring and disposal of the coarse wool.

Specific goals are to:

- Convert the unusable, greasy wool into an effective soil conditioner fertiliser using a pilot unit, specially designed and built to cope with one-third of the an-

LIFE12 ENV/IT/000439
LIFE+GREENWOOLF



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

Institute for Macromolecular Studies

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Name of contact person

Claudio TONIN

Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

1,995,265.00

EC contribution in euro with %:

997,632.00 (50.00%)

Themes: Industry-Production: Textiles – Clothing / Waste: Industrial waste

nual wool shearing of the Piedmont region (1 tonne/day); and

- Demonstrate that unusable coarse wools, which represent a by-product estimated at more than 150 million tonnes/yr (about 75% of the greasy wool shorn annually), can be recycled, without any preliminary scouring treatment, into a added-value green material, with benefits for the environment and profit for the EU livestock sector.

Expected results

- Wool waste shown to be 100% recyclable as organic fertiliser using a 'green hydrolysis process' with no use of dangerous chemicals; and
- The development of an economically sustainable management model that takes into account the sheep population and density distribution in the Piedmont region in order to optimise plant size and the added value of the fertiliser produced.

Sediment ElectroKinetic REmediation Technology for heavy metal pollution removal

Project background

Ports host companies that deal with transport, manufacturing, chemicals and oil refining, and the storage of chemicals, solvents, mineral oils, pulp and paper and food. Port areas also manage toxic waste and non-ferrous material. Consequently, harbours and coastal areas throughout Europe have deposits of sediment that are contaminated with heavy metals and organic substances such as hydrocarbons and polyaromatic hydrocarbons.

Dredging of harbours is done periodically for maintenance. The dredged sediments are most commonly dumped in nearby marine waters. Over time, contaminants in the sediment build up to reach concentrations that degrade the marine environment around the port. The yearly volume of dredged material Europe-wide is very roughly estimated to be 200 million m³, of which about 60% is contaminated.

As a consequence of heavy industrial activity and commercial and passenger maritime transport, the Port of Livorno has been listed in Italy as a Polluted Site of National Relevance. The environmental site assessment showed that a thick layer (up to 3 metres) of the port seabed is polluted by heavy metals. The total volume of sediments to be treated is 218 000 m³. Contaminants include cadmium (Cd), mercury (Hg), lead (Pb), copper (Cu), zinc (Zn), arsenic (As) and polyaromatic hydrocarbons (PAH).

Project objectives

The project will demonstrate, through several actions, that sediment dredged from port waters, and characterised by heavy metal and hydrocarbon concentrations above acceptable standards, can be treated in a specifically equipped Confined Disposal Facility using electrokinetic remediation (EKR). The project will demonstrate the environmental and economic benefits of this solution over landfilling.

The project will construct an EKR demonstration plant in the Port of Livorno to treat approximately 150 m³ of dredged sediment.

Expected results

- Decontamination through EKR of dredged polluted harbour sediments containing heavy metals and hydrocarbons: 80% of Cd, Hg and Pb will be removed, and up to 95% of Ni, Zn, As, Cu and PAH will be removed, resulting in full compliance with legislation;
- Reduction of sediment volume using innovative elec-

LIFE12 ENV/IT/000442

SEKRET Life



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Name of contact person

Renato IANNELLI

Duration of project:

36 months (01/01/2014 – 31/12/2016)

Total budget in euro:

1,820,203.00

EC contribution in euro with %:

908,661.00 (50.00%)

Themes: Risk management: Site rehabilitation – Decontamination / Services and Trade: Transportation – Storage

tro-osmosis techniques; these will reduce the volume of sediment by 50%, meaning a reduction in the volume of sediment to be stored in the Confined Disposal Facility; and

- Sediments will be disposed of in a Confined Disposal Facility that could be converted either into a port industrial/commercial facility or into a recreational area, or be reused for one of a range of activities (habitat restoration/enhancement or beach nourishment, aquaculture, parks and recreation, forestry, agriculture and horticulture, and construction and industrial activities) with a substantial reduction of overall project costs.

The expected economic impact of the new sediment management approach for construction and maintenance works will be at least €15 million on a triennial basis, on the basis of the Livorno Port Authority 2010-2012 Operative Plan. Furthermore, the energy cost will be reduced by 70% in comparison with previous EKR applications and experiments.

Helping enhanced soil functions and adaptation to climate change by sustainable conservation agriculture techniques

Project background

In the river Po plain, the organic carbon stock stored in soils varies from 34-60 tonnes per hectare (t/ha). The potential for further uptake if soils are managed appropriately is estimated to be at least 12.8 t/ha of CO₂ equivalent. Furthermore, increasing the organic content of soil improves the physical and chemical qualities of soils, leading to enhanced fertility and better absorption of nutrients. This helps ensure that crops can resist environmental stresses, reduces erosion and soil susceptibility to compaction, improves the ability of soils to act as a filter and buffer against pollutants, and boosts soil biodiversity. Better soil management can therefore contribute significantly to increasing the resilience of terrestrial ecosystems in the face of climate change.

Project objectives

The LIFE HelpSoil project will test and demonstrate innovative solutions and soil management practices to improve soil quality, and to make agricultural systems more resilient against climate change. The project will cover the whole Po plain (an area of some 46 000 km²) and the Alpine and Apennine foot-hills.

Specific project objectives include:

- Implementing practices to improve the ecological functions of soil – organic carbon sequestration, soil fertility and biodiversity, protection against erosion – in a number of farms, with the goal of increasing agricultural sustainability and competitiveness; and
- Integrating conservation practices and innovative techniques in order to increase the efficiency of irrigation; improve the efficiency of fertilisers, in particular livestock manure; and limit the use of pesticides.

The project will also develop indicators of soil ecosystem functions and new techniques to assess the environmental benefits of the practices tested by the project.

Expected results

It is expected that the introduction of farm management practices based on the principles of conservation agriculture will achieve the following results:

- An increase in the organic carbon content of soil of 0.2-0.7 t/ha/yr;
- Enhancement of the biological fertility of soil;
- Less soil erosion;
- A reduction in greenhouse gases and ammonia emissions;

LIFE12 ENV/IT/000578
LIFE HelpSoil



Beneficiary:

Type of beneficiary

Regional authority

Name of beneficiary

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Name of contact person

Alberto LUGOBONI

Duration of project:

48 months (01/07/2013 – 30/06/2017)

Total budget in euro:

2,941,515.00

EC contribution in euro with %:

1,308,381.00 (44.74%)

Themes: Climate change – Energy: Adaptation to climate change / Industry-Production: Agriculture – Fisheries

- More efficient use of irrigation water and fertilisers;
- Sustainable use of pesticides;
- Reduction by 60-70% of fossil fuel consumption for soil works;
- Enhanced adaptation to climate change of agricultural systems;
- Greater eco-efficiency and competitiveness of agricultural systems; and
- Greater stability of crop yields, despite increased climatic variability.

In addition, the project will also draft technical guidelines based on the results and adapted to different climatic conditions and cropping systems.

Original ennobling recycling process of GFRP waste to re-produce GFRP replacing energy-intensive construction elements

Project background

Products made from glass-fibre reinforced plastics (GFRP) are a class of composite building material consisting of a glass-fibre reinforcement encased in a polymer. The solid waste generated by the GFRP manufacturing process consists of cured polymer resin and scrap fibre reinforcement material (glass). Recycling this waste is problematic and an integrated recycling system for GFRP (i.e. one that is able to recycle the waste in the same manufacturing cycle) is needed to ensure that the quality of recovered fibre and filler is sufficient for reuse.

Project objectives

The project will show how GFRP waste can be processed to create fireproof, sound-absorbing, insulating, anti-shock and easy-to-clean panels to be used in sustainable buildings. The panels will be easily removable and reusable – they will be “designed for deconstruction”, thus contributing to reductions in emissions and energy consumption from the adaptation and demolition of buildings. The panels will also offer improved building thermal insulation, and therefore reduced energy consumption for heating and cooling.

Expected results

- Establishment of a demonstration line that will process about 100 tonnes/year of GFRP waste and convert it into panels for schools and public buildings. The panels will be 4 to 30 mm thick, will consist of ground GFRP waste of up to 25% by weight, will have low thermal conductivity, will have a surface appearance similar to natural material (such as leather, wood or cork), and will be completely recyclable;
- Creation of a geographical database indicating potential neighbouring sources of GFRP waste and the amount of waste available per year;
- An assessment of the GFRP panels in terms of their anti-shock, sound-insulating and cleaning properties, and their ease of installation and dismantling; and
- A reduction of at least 15% in CO₂ emissions resulting from the heating and cooling of rooms built from the GFRP panels.

LIFE12 ENV/IT/000579
LIFE Enrich a poor waste



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Sonia PIUMATTI

Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

1,743,768.00

EC contribution in euro with %:

840,259.00 (50.00%)

Themes: Industry-Production: Building / Waste: Waste use

Bio-inspired thermo/UV curable monomers and polymers

Project background

Starchy biomasses are used in the manufacture of plastic materials, surfactants and chemicals for pharmaceutical compounds. These biodegradable polymer materials are used in many fields for the production of bottles, film and shopping bags etc. Most commercial microbial production is based on sugar beet and cane molasses, although they contain many impurities requiring specific treatments either before, or after, the fermentation processes. Itaconic acid (IA) is produced by fermentation from a fungus, *Aspergillus terreus*.

IA-based monomers and polymers are used to produce bio-based adhesives, inks and paints to ensure that packaging made from polylactic acid (PLA) maintains the biodegradable and compostable properties required by the EU standard EN 13432.

Project objectives

The LIFE BiMoP project will target the applications of itaconic acid (IA) and its derivatives:

- As reactive diluents for thermo- and photo-initiated radical polymerisation in the production of coatings and inks and adhesives;
- As curing agents of epoxy resins to replace hazardous chemicals and environmentally harmful polyamines and polyamidoamines;
- To synthesise bio-based unsaturated polyester resins by polycondensation reactions to replace maleic anhydride (MA), which is both harmful to the environment and to human health;
- As a safer and sustainable alternative to styrene, which is toxic and harmful to human health;
- As a derivative for the polymer modification of commodities (such as PP and PE) to eliminate the use of MA; and
- As unsaturated polyester for polymer matrix composites, such as laminates with glass fibres, eliminating styrene as a reactive diluent.

Expected results

The project expects to achieve the following results:

- The production of up to 10 kg per week of unsaturated polyester resins, di-alkylester derivatives for PVC plasticisers (phtalate-free plasticisers) using lab-scale equipment from the commercially available IA;
- A definition of the timescale for the actions required for technological transfer and prototype preparation (such as glass fibre laminates for innovative biocomposites, thermo- and UV-curable mixtures);

LIFE12 ENV/IT/000600

LIFE BiMoP



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

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Marco SCOPONI

Duration of project:

24 months (01/10/2013 – 30/09/2015)

Total budget in euro:

1,866,176.00

EC contribution in euro with %:

867,212.00 (50.00%)

Theme: Industry-Production: Plastic - Rubber -Tyre

- A decrease of styrene emissions by approximately 8%, by replacing it with the IA-based monomers and polymers (styrene emissions will be monitored in terms of their environmental and human health impacts);
- The use of UV-curable mixtures formed by IA-based unsaturated polyesters or the dialkyl derivatives in the field of food packaging as safer inks or coatings for end-users;
- The application of polyolefin modified by IA in hot melts' adhesive and in food packaging;
- The production of bio-based abrasive tapes and laminates in line with stakeholder requirements/suggestions and in compliance with the REACH regulation; and
- A decrease in formaldehyde and styrene emissions of some 8% (compared with current industrial production activity based on 1 000 tonnes/yr) by replacing the phenol-formaldehyde resins with water-based epoxy resins that have IA derivatives as curing agents.

Highly-efficient Valorisation of AHP waste through a novel combination of Autoclave and Gasification

Project background

The annual production of municipal solid waste (MSW) has increased steadily in Europe, from 468 kg per person in 1995 to 524 kg in 2008. EU, national and local regulators and decision-makers have promoted the recycling and reuse of different MSW fractions. Many European countries already recycle more than 50% of some waste categories, but there are several fractions that currently cannot be recycled. Organic fractions (mainly pulp, paper and wood waste) currently make up about 35% of total MSW. This waste is usually non-recyclable or only partially recyclable because of the large volumes of waste generated, its high moisture content and its changing composition as a result of process conditions. These fractions could also be used to generate energy, but this has only been tried at pilot level in the EU, and it requires the waste input flow to have a homogeneous quality.

Project objectives

The LIFE+ -VIRGIN project will test an innovative solution for the use of cellulosic residues from a wide range of sources (35% of total MSW).

Specific objectives include:

Technical:

- Demonstration at a pre-industrial pilot plant of an innovative, integrated process, based on autoclave pre-treatment and gasification, rather than incineration, for the recovery of energy from complex waste streams, in particular from absorbent hygiene product (AHP) residues.

Environmental:

- A 20% increase in energy yield compared to incineration, particularly at small-medium scale;
- A reduction in harmful emissions, compared to current incineration practices, by removing emission sources prior to and during gasification; and
- The development of a valuable, flexible energy carrier, allowing for the recovery of up to 75% of the chemical energy of the treated feedstock, which will produce up to 700 kWh of electricity per tonne of AHP waste, and will cogenerate steam.

Policy and market:

- The conversion of waste, with an associated disposal cost, into saleable, high-value commodities (such as electricity and synthetic gas); and
- The development of a process that will be demonstrably cost effective.

LIFE12 ENV/IT/000611

LIFE+ -VIRGIN



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Marcello SOMMA

Duration of project:

30 months (01/07/2013 – 31/12/2015)

Total budget in euro:

2,060,756.00

EC contribution in euro with %:

1,030,378.00 (50.00%)

Theme: Waste: Municipal waste (including household and commercial)

Expected results

- A blueprint for a redesigned, combined autoclave/gasification process, with substantially improved efficiency and environmental performance compared to incineration;
- A pilot plant for the novel integrated process, capable of treating 450 tonnes of waste/year, producing about 0.4 GWh/year of electricity;
- Demonstration of a process that results in a volume of waste of less than 5%, compared to about 28% for small-scale incineration plants;
- Better return on investment for electricity production from waste: a medium-sized incineration plant costs about 4 000 €/kW, whereas a VIRGIN plant will cost 2 500 €/kW. Moreover, the steam and electricity generated can be reused internally by the process, thus making it self-sufficient; and
- Certification of the environmental sustainability of the process based on a lifecycle assessment.

Monitoring air pollution effects on children for supporting Public Health Policy

Project background

Several epidemiological studies have demonstrated the association between exposure to air pollution and mortality and morbidity in humans. In 2005, an estimated 5 million years of life were lost due to fine particle pollution in 32 European countries (European Environment Agency Technical report no. 12/2011, Air quality in Europe). Urban pollution, caused by traffic, factories, heating systems and energy generation, is a complex and variable mixture of several compounds, some of which cause genetic damage.

Recent epidemiological studies have found an association between exposure to airborne particulate matter (PM) and the incidence of, and mortality caused by, cardiovascular disease, lung cancer and possibly other chronic diseases such as diabetes and chronic obstructive pulmonary disease. Children are at a higher risk from airborne chemicals because they have higher levels of physical activity (and spend more time outside) than adults. They also have smaller bodies, faster growth rates and relatively immature organs, body functions, immune systems and cell repair mechanisms. Finally, recent data suggests that genetic damage occurring early in life can increase the risk of carcinogenesis in adulthood.

Project objectives

MAPEC_LIFE will evaluate the links between pollutants, such as PM and nitrogen oxides, and polycyclic aromatic hydrocarbons (PAHs) and nitroPAHs (nitro-polycyclic aromatic hydrocarbons), and their early effects. The project will then build a model for estimating the risk to children from air pollutants and other factors.

The specific objectives are to:

- Assess the concentrations of certain organic compounds (PAHs and nitroPAHs) in the air in some Italian towns;
- Assess air mutagenicity and toxicity in the same areas, through in-vitro tests on very fine particles (PM_{0.5});
- Study the relationship between the concentration of air pollutants and air mutagenicity and toxicity;
- Investigate children's exposure to other airborne pollutants, via a questionnaire filled in by parents;
- Assess early effect biomarkers in oral mucosa cells from the children;
- Carry out a risk analysis of carcinogenic effects based on environmental data; and
- Compare the results of the risk-analysis model ('expected') with the early effect biomarkers actually found in the children ('observed').

LIFE12 ENV/IT/000614
MAPEC_LIFE



Beneficiary:

Type of beneficiary

University

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Umberto GELATTI

Duration of project:

36 months (01/01/2014 – 31/12/2016)

Total budget in euro:

2,246,502.00

EC contribution in euro with %:

1,112,189.00 (50.00%)

Theme: Risk management: Human health protection - Risk assessment and monitoring

Expected results

- Completed questionnaires for 1000 children aged 6-8;
- Collection of 20-45 PM_{0.5} air samples, and analysis of PAHs, nitroPAHs and in-vitro mutagenicity/toxicity tests on the samples;
- Collection of 1000 samples of children's oral mucosa cells in both summer and winter seasons, and evaluation of early effect biomarkers in the samples;
- Preparation of risk analysis models based on environmental data;
- An assessment of the relationship between air pollutants, air mutagenicity/toxicity, and early effect biomarkers, and an evaluation of the value of the risk analysis model for predicting early biological effects in children;
- Construction of a global model of the risk of early biological effects in children; and
- Recommendations for measures and policies to protect children from the health effects of air pollutants.

Endocrine Disruptors in silico / in vitro Evaluation and Substitution for Industrial Applications

Project background

Environmental and health problems related to endocrine disruption have increased in recent decades. Abnormalities in the reproductive system of various aquatic species (fish, molluscs, amphibians, reptiles) as well as human fertility have been linked to chemical pollution threats.

Key aims of the EU's REACH Regulation include improving awareness of the risks associated with particular chemicals and ensuring that industry is able to assess hazards and identify and implement appropriate risk management measures to protect humans and the environment. In particular, the introduction of suitable alternatives should allow the progressive substitution of the most dangerous chemicals. Test programmes within REACH do not include specific tests for endocrine-disrupting properties because there are no internationally agreed methodologies or criteria available (ECHA Guidance for Substances of Very High Concern [SVHC]).

Project objectives

The LIFE EDESIA project aims to improve implementation of the REACH Regulation by providing at least one suitable alternative for bisphenol A/BPA, phthalates and parabens. Anticipated applications of the alternatives will include hard plastics, PVC-based medical devices for phthalates, and antimicrobials (personal care products and over-the-counter drugs) for parabens. The potential alternatives will be tested for absence of mutagenicity/genotoxicity and persistence/bioaccumulation by (Q)SAR; the in vitro tests will provide a comprehensive screen for endocrine-disrupting properties, in order to implement REACH measures for EDCs as 'substances of equivalent concern'.

These objectives will be achieved by the following actions:

- Applying the substitution principle to EDCs of 'equivalent concern', on the basis of i) endocrine disruption effects, ii) high production volume, iii) widespread use, and iv) potential exposure of general population to SVHCs, namely: phthalates, bisphenols and parabens;
- Demonstrating a new, robust and cost-effective in silico/in vitro approach to evaluate suitable chemicals for replacing EDCs of equivalent concern, that can support the application of the REACH legislative framework on the substitution principle environment;
- Identifying potential substitutive chemicals using both emerging and existing in silico approaches;
- Performing a comparative assessment of the different potential substitutive chemicals using the in silico approach;

LIFE12 ENV/IT/000633
LIFE EDESIA



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Alberto MANTOVANI

Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

1,205,464.00

EC contribution in euro with %:

602,731.00 (50.00%)

Themes: Industry-Production: Chemicals / Risk management: Human health protection

- Synthesising the selected substitutive chemicals;
- Creating prototypes that use the substitutive chemicals, and assessing them for release of chemicals; and
- Demonstrating the feasibility of the substitution of the EDCs in industrial applications.

Expected results

- A list of some 15 REACH-compliant potential substitutive chemicals for parabens, bisphenol A and phthalates;
- A step-wise system of in silico / in vitro integration and cross-validation for EDC substitute chemicals assessment, in compliance with REACH legislation;
- A report on the potential use of the chemical substitutes for EDCs for industrial purposes (medical devices, cosmetics and food packaging); and
- Two seminars to promote mainstreaming of the project's findings at EU level.

Innovative integrated methodology for the use of decontaminated river sediments in plant nursing and road building

Project background

Sediments – originating in freshwater basins mainly through erosion processes – are drifted to the coast with the river flow. Along the way, they are contaminated by heavy metals, nutrients from pesticides and other organic micro-pollutants. Every year in Europe 130 million m³ of polluted river sediments are dredged and need to be disposed of in specific and expensive ways (costing up to €7 000/tonne). Moreover, 5.2 million m³ of soil are extracted every year from the ground to support plant nursing activities. To prevent the risk of an 8-10 mm/yr lowering of the ground level, plant nurseries are forced to buy soil from third-party catchments, which are often of poor quality and contribute to soil exploitation elsewhere.

Similar problems are faced by the EU road building industry, whose yearly demand for sand, gravel and aggregates for stability and draining purposes is around 30 million m³, for an average value of €450 million.

Project objectives

The LIFE CLEANSED project will demonstrate, evaluate and disseminate an innovative, integrated, multi-sector approach for the smart and sustainable management of polluted dredged river sediments. Polluted sediments will be dredged, transformed from a contaminated waste into valuable material via a specific decontamination treatment, and subsequently used.

Specific project objectives include:

- Turning the polluted sediments from a valueless and expensive waste into a valuable raw material for plant nursing and road building, guaranteeing the full environmental and financial sustainability of the approach;
- Using the decontaminated sediments as a substrate/amender to prevent the loss of soil and biomass because of plant nursing activities; and
- Using the decontaminated sediments as a filler material for the construction of roads.

Expected results

- The decontamination of 836 m³ of dredged river sediments, which will be turned from valueless waste into a usable and marketable raw material;
- The smart management of contaminated sediments: instead of treatment costing an average price of €75/m³, it will cost €35/m³ and the sediments will be turned

LIFE12 ENV/IT/000652
LIFE CLEANSED



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Name of contact person

Graziana MASCIANDARO

Duration of project:

30 months (01/10/2013 – 31/03/2016)

Total budget in euro:

1,655,370.00

EC contribution in euro with %:

827,683.00 (50.00%)

Theme: Water: Waste water treatment

into clean raw material with a market value between €10 and €20/m³. This will mean a 66-80% net saving for sediment decontamination and the valorisation of a waste stream;

- Demonstration of the efficacy of using decontaminated river sediments as a substrate for the cultivation of 72 ornamental plants of three different species characterised by different levels of saline stress tolerance;
- The demonstration of decontaminated river sediments as a suitable structural material for the construction of a 100m-long road;
- The use of 836 m³ of decontaminated sediments instead of aggregates from third-party catchments, with subsequent conservation of quarry and river environments; and
- The sustainable restoration of agricultural soil used for plant nursing..

OPTImised nutrients MAnagement from Livestock production in Alto Adige

Project background

Spreading of manure on land is a major source of ammonia emissions into the atmosphere. This issue is addressed by Directive 2001/81/EC ("National Emissions Ceiling for certain pollutants" – NEC Directive), which aims to ensure greater protection of the environment and human health from the harmful effects caused by the phenomena of acidification, eutrophication and formation of ozone at ground level.

Following the introduction of the Nitrates Directive (Directive 91/676/EEC), the disposal of manure became an economic challenge for farmers as the amount of waste produced is often greater than the limit allowed by the directive for its distribution on the land. Hence farmers now have to find economically viable ways of disposing of their excess manure.

Project objectives

The LIFE-OPTIMAL2012 project aims to demonstrate an innovative approach for managing manure produced by livestock farming. The approach will be based on:

- Minimising regional nutrient surpluses caused by intensive dairy cattle rearing and agricultural land shortages;
- Producing natural, high quality forms of both solid and liquid fertiliser to be used in vineyards and orchard growing areas; and
- Reducing land abandonment pressures among livestock farmers in upland areas.

These objectives will be achieved by actions focused on:

- Implementing an environmentally sound system for the treatment of solid and liquid manure from an anaerobic digestion plant;
- Reducing the nitrogen/nitrates load per hectare of agricultural land;
- Reducing greenhouse gas emissions by replacing industrial fertiliser with organic-mineral fertiliser in vineyards and orchards; and
- Decreasing emissions of ammonia.

The transformation of NH_3 in manure to high-quality, liquid fertiliser and the development of a high-precision and low-emission spreading system for digestate will improve the ability of farmers to comply with the NEC Directive.

LIFE12 ENV/IT/000671
LIFE-OPTIMAL2012



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Josef MAYR

Duration of project:

54 months (01/07/2013 – 31/12/2017)

Total budget in euro:

5,189,977.00

EC contribution in euro with %:

1,920,120.00 (49.68%)

Themes: Industry-Production: Agriculture – Fisheries / Waste: Agricultural waste

Expected results

- A 50% reduction in the nutrient load in the target area;
- An increase in the quality and variety of eco-friendly fertilisers available to South Tyrolean farmers (Considering the 30 500 tonnes of digestate that are handled annually, it should be possible to produce 2 250 tonnes of solid and 130 tonnes of liquid fertilisers); and
- Maintaining farm incomes for the project's target group of mountain holdings.

Specific results relate to the setting up and proper functioning of the demonstration plant and the decreasing of nitrate loads equal to 50 kg per LU per year, as well as decreasing ammonia and related greenhouse gas emissions.

Recycling of thermal spray waste in sintered products

Project background

Thermal spraying refers to a group of versatile coating technologies that are used to deposit thick (50 µm - >1 mm) layers of ceramic, metallic, cermet or composite materials for a number of fields, including the mechanical industry, aeronautics, energy production and the biomedical industry.

During conventional spraying processes, as much as 80% of the powder is not used, and this 'overspray' has to be recovered for treatment as waste. Previously, waste treatments have involved negative environmental impact risks because the metallic powders used in thermal spray coatings are often based on nickel, which is considered to be a human carcinogen. In addition, ceramic powders such as Yttria-stabilised zirconia (YSZ) are also potentially hazardous. Both YSZ and nickel alloys are valuable materials, and their waste disposal equates to a loss of primary resources.

Project objectives

The main aim of the LIFE ReTSW-SINT project is to demonstrate the feasibility of valorising and recycling different types of thermal spray waste into high-value products for industrial and residential use.

The project will select particles with the same base chemical composition in two streams: spherical or with size below 60 µm and splat-like or with larger dimensions. The spherical particles will be reused for manufacturing of simple-shaped parts by spark plasma sintering (SPS). The remaining particles will be immobilised in a glass matrix to avoid leaching of heavy metals, which are used in both reactive and non-reactive silica-based systems to convert the powders into frits (rapidly water-cooled glass powders) and also to manufacture glazed ceramic tiles that have abrasion resistance, conductivity, electro-magnetic field absorption and aesthetic properties.

Specific project actions:

- Characterisation of spent thermal spray powders and definition of usable separation techniques;
- Implementation of waste powders stream separation according to composition, particle size and morphology;
- Development of innovative frits modified with the recovered particles and using recycled glass; and
- Development of innovative glazes modified with direct addition of recovered thermal spray powders or by the new frits.

LIFE12 ENV/IT/000678
LIFE ReTSW-SINT



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Corrado MANNELLI

Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

2,542,781.00

EC contribution in euro with %:

1,248,289.00 (50.00%)

Themes: Industry-Production: Chemicals / Waste:
Industrial waste - Waste recycling

Expected results

- A zero-waste approach at thermal spraying plants to the re-use and valorisation of the powders in SPS or in ceramic firing;
- Immobilisation of harmful contaminants of spent thermal spray powders (mainly heavy metals) in matrixes (glass matrix, ODS composites) that do not leach such elements;
- Absorption of other waste, such as recycled glass cullet, for preparation of the glass matrix and to lower its softening point;
- Application of low-energy consumption techniques for recycling of thermal spray spent powders;
- Realisation of antistatic and electro-magnetic field shielding tiles;
- Cost savings for thermal spray powders disposal (around €1.2 per kg);
- Cost savings for supplying refractory ceramic powders by recycling the alumina and zirconia ones; and
- Recovery of NiCoCrAlY powders as raw material for the ceramic tile industry.

LIFE+ GLEE “Green Li-ion batteries through Electrode Electroless deposition”

Project background

The use of high performance, rechargeable lithium-ion (Li-ion) batteries is growing fast in a number of industrial sectors, including mobile phones, laptop computers and electric vehicles. Despite the success of Li-ion technology, major advances in power storage solutions are required to support the transition to an adaptive, carbon-free economy.

The production of Li-ion batteries involves the use of the solvent N-Methyl-2-pyrrolidone (NMP), which has been classified by the European Chemicals Agency as a “substance of very high concern” because of its carcinogenic, mutagenic and toxic effects on reproduction properties. The REACH regulation encourages progressive substitution of NMP in all applications.

Project objectives

The LIFE+ GLEE project aims to eliminate NMP from the rechargeable Li-ion battery manufacturing process. This will be achieved by the demonstration of an alternative technology for Li-ion batteries – using water-based green solvents – which, in addition to not carrying toxic risks, also reduces the manufacturing costs associated with the NMP solvent recovery and re-purification processes.

A pilot Li-ion battery materials plant will be built to demonstrate the alternative process for the manufacture of batteries for electric vehicles. The aim is to show that these new batteries, with innovative electroless cathode coating technology, will perform better than conventional Li-ion ones: they will demonstrate significantly greater capacity retention under high stress conditions and a longer life.

Such advances in rechargeable battery technology are vital for the achievement of a low-carbon transport economy, clean chemicals and renewable energy systems. The project will also contribute to the implementation of EU environmental policy by demonstrating the process in production conditions and by showing its feasibility, economic sustainability and a positive lifecycle analysis (LCA) assessment.

Expected results

By building a chemical plant capable of producing active battery cathode material under industrial conditions, the project expects to produce:

LIFE12 ENV/IT/000712

LIFE+ GLEE



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Francesco TRIULZI

Duration of project:

31 months (02/09/2013 – 31/03/2016)

Total budget in euro:

1,700,989.00

EC contribution in euro with %:

593,400.00 (48.33%)

Theme: Industry-Production: Chemicals

- Tried and tested plant operating design, processes and formulae;
- Sufficient quantities of the clean chemical material to enable its evaluation by battery-makers and research organisations;
- A sufficient quantity of new technology batteries (hundreds-thousands) to enable their testing by independent testers, as well as for demonstration to end-user consumers, such as manufacturers of electric cars and/or the Solar Impulse fuel-less aircraft project; and
- Thorough assessments of the project's carbon footprint, socio-economic impact, potential for commercialisation and industrialisation, as well as an LCA.

Technologies to stabilise soil organic carbon and farm productivity, promote waste value and climate change mitigation

Project background

Organic matter is a vital component of soil functionality and its associated productivity. Land use and soil cultivation methods can significantly affect the status of organic matter in soil. Decline is accompanied by a decrease in soil fertility and biodiversity, and loss of structure, whose factors, in turn, increase the overall soil degradation. Unless organic matter is quickly replenished, the soil system can rapidly degrade, compromising the economic and environmental sustainability of soil functions.

The decline of soil organic matter (SOM) content represents a considerable threat to the long-term productivity of crop production areas in the Mediterranean region. Key problems relate to intensive soil exploitation and discarding of crop residues and agricultural byproducts. These factors can result in a low amount of organic carbon inputs and in a negative balance of SOM content.

Project objectives

The LIFE CarbOnFarm project intends to address the basic requirements concerning the sustainable use of agricultural soils through the restoration and preservation of soil functionalities. It will help to valorise the economic and environmental role of soil resource in agro ecosystems and improve the recycling of agricultural biomass.

Environmentally sustainable methods of SOM management will be used that are tailored to non-livestock farms from Southern Europe. Target areas include those characterised by limited access to organic matter sources, the progressive decline of SOM content and the steady increase of soil erosion and desertification processes. On-farm composting facilities will be introduced to promote the productive and financially-viable valorisation of residual biomass from local agricultural activities.

Project monitoring actions will provide new and valuable data concerning soil organic carbon (SOC) quantity and quality, greenhouse gas (GHG) emissions from cultivated soils, soil stability and crop productivity, as well as the environmental, energetic and economic sustainability of the applied methodologies.

These indicators will represent an important tool to support decision-making processes concerning sustainable agriculture at both national and European level. Project actions will thus help complement implementation of the EU Soil Thematic Strategy, particularly for cultivated land in the Mediterranean area.

LIFE12 ENV/IT/000719

LIFE CarbOnFarm



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

Università degli Studi di Napoli Federico II - Centro di Ricerca Interdipartimentale sulla Risonanza Magnetica Nucleare (NMR) per l'Ambiente, l'Agro-Alimentare e i Nuovi Materiali

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Name of contact person

Riccardo SPACCINI

Duration of project:

60 months (01/07/2013 – 01/07/2018)

Total budget in euro:

3,051,265.00

EC contribution in euro with %:

1,495,027.00 (49.24%)

Theme: Industry-Production: Agriculture – Fisheries

Expected results

The main expected outcomes relate to improvements of soil status in terms of organic matter, structure and biodiversity:

- An appreciable increase of SOM level through the stabilisation and sequestration of SOC;
- Improvement of soil aggregation and soil structural stability;
- Enhanced soil biological fertility;
- Maintenance of crop productivity; and
- Lower GHG emissions.

Stakeholder collaboration will result in:

- The transfer of knowhow and uptake of improved on-farm composting technology;
- Appreciation about the valorisation of agricultural residues as important local bio resources; and
- Collection and modelling of land use and SOC sequestration data in agro ecosystems in order to support the technical and political commitments required for mainstreaming sustainable soil use methods amongst Mediterranean arable farmers.

Realisation of green composite sinks substituting organic and mineral primary materials by recovered waste

Project background

The use of composite kitchen sinks is growing rapidly. Among the three main types, (polyester/acrylic, quartz composite and granite-based) quartz composite – 60-70% quartz and 30% resin filler – provides a much more durable surface than polyester/acrylic. However, to date, in the manufacture of quartz composite sinks, no use is made of secondary raw materials. Furthermore, quartz composite sinks are made using fillers of Methyl methacrylate (MMA) (20-30%) and Poly-methyl methacrylate (PMMA) (10%), with most of the waste produced in the manufacturing process sent to landfill as 'special industrial waste'.

It is estimated that the waste from composite sink manufacturing in Europe amounts to over 3 000 tonnes of minerals, heavily polluted with polymers, and worldwide to approximately 8 million tonnes per annum. Furthermore, the use of quartz and quartz-like primary materials places a heavy demand on the availability of natural mineral resources, and is harmful to the environment.

Therefore, the recovery of waste from composite sink manufacturing would help offset the landfilling of this type of waste, and reduce the excavation of primary raw materials such as quartz and cristobalite (minerals).

Project objectives

The project aims to develop the first 'green sinks' and to demonstrate the feasibility of 100 % substitution of primary resources by the treatment and recycling of 80% of MMA and PMMA used in the manufacture of composite sinks. The recovered MMA and PMMA will be recycled with other minerals and moulded to form new (composite) sinks.

Specific objectives include:

- The preservation of the environment and primary resources by reducing the requirement for the mining of quartz and cristobalite minerals used in the production of composite sinks;
- The recycling of a large variety of mineral waste (glass, quartz from stone industries), which will comprise 60-70 % of the green sinks;
- Reduced fuel consumption due to a reduced need to transport minerals; and
- Reduced landfilling of waste material from the composite sink industry.

A Life Cycle Assessment will be carried out on the green sinks and validated according to the ISO 14040 and ISO 14044 methodologies.

LIFE12 ENV/IT/000736
LIFE GREEN SINKS



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Maria Savina PIANESI

Duration of project:

24 months (01/07/2013 – 01/07/2015)

Total budget in euro:

1,580,980.00

EC contribution in euro with %:

766,990.00 (50.00%)

Theme: Industry-Production: Plastic - Rubber -Tyre

Expected results

- 100% green sinks – with the feasibility of completely substituting MMA, PMMA and mineral fillers with suitably treated secondary raw materials and green additives proven from a technical and economic perspective;
- Proven feasibility of recycling 80% of Delta's composite sinks waste; and
- 20-30 green sink products available for demonstration.

Concrete environmental improvements expected during the project's lifetime include:

- MMA recycled in green sink lab and pilot trials – c. 12 000 kg;
- PMMA recycled in lab and pilot trials – c. 30 000 kg;
- Mineral waste recycled in lab and pilot trials – c. 28 000 kg;
- Total recycled materials used in the project – c. 44 tonnes; and
- Total waste from Delta's composite sink production diverted from landfill – at least 1 400 kg.

Mediterranean Health Interview

Surveys Studies: long term exposure to air pollution and health and surveillance

Project background

Knowledge of the long-term effects of air pollution on human health has been improving over the past 10 years, mainly as a result of efforts to design and carry out large-scale epidemiological studies. Notwithstanding, no long-term data are available for Mediterranean countries, where higher air temperatures, the composition of particles and Saharan dust all influence environmental characteristics – making these countries different to Continental and northern European areas.

In previous short-term effect studies in Europe, a clear north-south gradient in the particulate matter (PM10) mortality association was observed, with Mediterranean cities showing higher relative risks than continental cities. Better knowledge of the long-term effects of air pollutants, including fine and coarse particles, is needed to contribute to policy on the environment and health, to update and support EU legislation in this field, to plan mitigation actions and to implement effective, practical measures.

Project objectives

The LIFE MED-HISS project is a demonstration project involving partners in Spain, France, Italy and Slovenia. Its main objectives are to:

- Update and develop EU environmental policy and legislation with improved data on the adverse health effect of air pollution (PM10, PM2.5, NO₂ and O₃);
- Consolidate the knowledge base for the development, assessment, monitoring and evaluation of environmental policy and legislation, by setting up a European surveillance system for the long-term effects of air pollution; and
- Assess the feasibility of the adopted approach in other European countries.

Expected results

- An evaluation of the long-term effects of PM10, PM2.5, NO₂ and O₃ on mortality and hospitalisation, considering natural causes, cancers, cardiovascular and respiratory diseases and asthma;
- An evaluation of the Health Impact Assessment (HIA) of air pollution in four EU countries – Italy, France, Slovenia and Spain (Catalonia);
- The creation of guidelines, a database and a report describing different exposure assessment experiences in the four European countries, with an assessment of inter-country variations; and

LIFE12 ENV/IT/000834

LIFE MED HISS



Beneficiary:

Type of beneficiary

Regional authority

Name of beneficiary

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Ennio CADUM

Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

1,598,283.00

EC contribution in euro with %:

790,788.00 (50.00%)

Theme: Risk management: Human health protection - Risk assessment and monitoring

- An evaluation of the feasibility of a simplified hybrid approach for air pollution exposure estimation, which could be used in future epidemiological studies..

Full Recovery End-of-Life

Photovoltaic

Project background

The stock of photovoltaic (PV) panels has been rising sharply in recent years and is currently estimated at some three million tonnes in the EU. However, sustainable solutions for the recovery of PV waste are still not well developed, and if not disposed of correctly, this waste can cause both environmental and human health problems. It is forecast, for example, that from 2015 onwards, 30 000 t/year will be disposed in Europe, and over the next 20 years this amount could reach 500 000 t/year, including: around 390 000 t/year of glass; 55 000 t/year of aluminum; 35 000 t/year of plastics; and 11 500 t/year of crystalline silicon cells.

Since 2012, PV has been included in the EU WEEE Directive, which requires manufacturers and importers to facilitate and finance the take-back and recycling of their discarded end-of-life products. Current technologies recycle glass in low-value industries, such as glass fibre and insulation. They do not allow for recovery of metals, especially crystalline silicon, which is used in more than 90% of PV cells worldwide. Silicon production implies energy costs that are equivalent to three years of PV energy production, which represents a serious drawback in terms of its environmental performance from a life-cycle approach.

Project objectives

The LIFE FRELP project aims to test and develop innovative technologies for 100% recycling of end-of-life PV panels in an economically viable way. Two main environmental solutions are proposed:

- The recovery of high quality extra clear glass, to be used in the hollow and flat glass industry, thus resulting in very significant energy and CO₂ emission savings in the glass melting process; and
- The recovery of (metallic) silicon, to be used as ferrosilicon in iron silicon alloys or, if pure enough, transformed into amorphous silicon for the production of thin films, thus greatly reducing energy consumption and CO₂ emissions associated with the production of primary silicon.

Expected results

The expected results, demonstrated at a pilot plant treating 3 500 t of PV panels over the project lifetime, are:

- Full recovery of aluminum and connectors for recycling in suitable industries;
- Development of a new technology for the improvement of EVA (Ethylene-vinyl acetate) detachment

LIFE12 ENV/IT/000904

LIFE FRELP



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Duration of project:

48 months (01/07/2013 – 30/06/2017)

Total budget in euro:

4,887,035.00

EC contribution in euro with %:

2,383,517.00 (50.00 %)

Theme: Waste: Waste from Electrical and Electronic Equipment (WEEE)

- from glass, preserving glass purity for integral recycling in valuable flat and hollow glass;
- Recovery of energy from EVA sandwich, maintaining the ability of crystalline silicon and metals to be processed;
- Development of a new acid leaching technology for the full recovery of (metallic) silicon, to be used as iron silicon alloys or amorphous silicon for the production of thin films;
- Full recovery of metals through micro- and nano-filtration of eluate, to be used for recycling in suitable industries;
- Recovery from 3 500 t PV panels of 2 800 t of glass, 350 t aluminum, 35 t connectors, 90 t fuel, 70 t gas, 157.5 t gasoil, 24 t of pure silicon, 3.15 t metals, and 0.35 t organic waste; and
- A considerable reduction in energy consumption and CO₂ emissions due to: the use of glass cullet in the glass melting furnace; the substitution of virgin silicon with recycled silicon; and the production of energy by EVA cracking.

Innovative PRImary MEasures for reduction of NO_x emissions and Energy consumption by glass furnaces

Project background

Container glass is the largest sector of the EU glass industry, representing 60% of total glass production. In 2011, furnaces in the EU produced 20 787 million tonnes of container glass (source FEVE). Europe is the largest producer of container glass, followed by the US and Japan.

The melting activities of the glass industry, however, give rise to a number of harmful environmental impacts. Fossil fuel combustion, in particular, produces pollutants and leads to the high-temperature oxidation of nitrogen in the combustion atmosphere. Melting also gives rise to particulate matter as a result of volatilisation and the subsequent condensation of volatile batch materials. Gases emitted from the raw materials and the melting substances can also be harmful.

Project objectives

The aim of the project is to test and demonstrate technologies that will significantly improve the environmental impact of the glass industry, focusing mainly on two environmental problems (although also having a positive impact on other aspects): NO_x emissions and high energy consumption. It will allow companies to comply with the new requirements set out in the recent Glass BREF update (2012) and provide future technologies for reducing NO_x emissions and energy consumption, as well as input for further BREF revisions.

Although the technologies will only be tested in the container glass sector, they are also applicable to others glass sectors, such as flat glass, tableware glass and special glass.

The main objectives of the project are to:

- Demonstrate the feasibility of two new technologies designed to significantly reduce, at source, the formation of NO_x during the combustion process in glass furnaces;
- Improve the energy performance of glass furnaces by increasing the heat exchange between exhausted flow gases and combustion air, and reducing CO₂, CO, sulphur oxides and dust emissions, as well as fuel consumption (gas and oil); and
- Demonstrate the advantage of infrared thermography applied to glass furnaces, which allows for quantitative monitoring of the temperature field in the melted glass and in the flame structure.

LIFE12 ENV/IT/001020
LIFE PRIME GLASS



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Giampaolo BRUNO

Duration of project:

45 months (01/07/2013 – 31/03/2017)

Total budget in euro:

3,130,741.00

EC contribution in euro with %:

1,324,463.00 (50.00%)

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Industry-Production: Non-metallic minerals

Expected results

Combustion optimisation:

- Validated combustion optimisation system trialed at two different furnaces;
- NO_x reduction of 30-50% and energy savings of 5-6% in tests with a small regenerator and 1-2% in tests with medium-size regenerator;

Port exhausted gas recycling system:

- Validated port exhausted gas recycling system trialed in a new furnace;
- NO_x reduction of 25-30% and energy savings of 3% with respect to the latest 'staging' technology proposed in the BAT.

Monitoring improvement:

- Validated automatic tool for temperature measurements and distribution based on thermography, and a validated automatic tool for CO₂ and CO flame distribution; and
- Proven efficacy of infrared thermography applied to the glass furnace system as an innovative approach to temperature monitoring and combustion analysis.

Wireless Sensor Network for Ground Instability Monitoring

Project background

Subsidence and land slides are two of the many natural processes that shape the surface of the earth. It is only when they threaten people or property that these processes represent a hazard. Scientists have long since tried to analyse the factors that give rise to these processes and to develop methods for modelling and evaluating safety factors. Landslides, especially if large and catastrophic, cause significant changes to the Earth's natural environment, negatively affecting forests, grasslands and wildlife. Ground instability monitoring systems play a vital role in assessing existing conditions and measuring the evolution of significant parameters in order to predict dangerous or catastrophic events. Such monitoring helps implement early warning systems and checks the effectiveness of consolidation works.

Project objectives

The project aims to develop and demonstrate innovative technologies, methods and instruments for landslide and subsidence monitoring, in line with the objectives of the Soil Framework Directive (COM/2006/231).

The specific objectives are to:

- Develop an innovative and cost-efficient Wireless Sensor Network (WSN), based on a technology known as Wi-GIM, for the 3D superficial monitoring of ground deformations, such as landslides and subsidence;
- Assess the limits and potentials of Wireless Sensor Network (WSN), based on a technology known as Wi-GIM, by comparing the results with conventional monitoring systems;
- Identify potential barriers to the full-scale application of the system, and demonstrate solutions to overcome them; and
- Evaluate the environmental and social benefits, and the economic feasibility of this innovative system.

Expected results

The main expected result is the development of a low-cost, accurate and flexible WSN (Wi-GIM) for ground deformation monitoring by means of the innovative integration of two radio technologies:

- LB technology, which is used for the acquisition of the 3D coordinates of the sensor position with an error radius of a metre in magnitude; and
- CWR, which is able to decrease the error radius to a centimetre in magnitude.

LIFE12 ENV/IT/001033
Wi-GIM LIFE



Beneficiary:

Type of beneficiary

NGO-Foundation

Name of beneficiary

International Consortium on Advanced Design

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Ennio CARNEVALE

Duration of project:

39 months (01/01/2014 – 31/03/2017)

Total budget in euro:

1,070,590.00

EC contribution in euro with %:

521,544.00 (50.00%)

Theme: Risk management: Risk assessment and monitoring

The expected advantages of the Wi-GIM system for ground deformation monitoring are:

- Easy implementation and maintenance in comparison with conventional methods;
- Short installation time and high versatility;
- The possibility to monitor movements on a lattice consisting of a large number of nodes; and
- 3D monitoring of movements.

Integrated coastal area Management Application implementing GMES, INspire and sEis data policies

Project background

Coastal areas are characterised by intense human activity and a complex interchange of physical, biological, social, cultural and economic processes. Changes at any point in any part of the systems can generate chain reactions far from their point of origin, and possibly in a totally different system, which subsequently experience changes in environmental conditions. If not properly managed, social and economic activities in coastal areas will result in the overexploitation of resources, with negative environmental effects, equity problems and a loss of social well-being. Indeed, in recent years, extreme rainfall, in combination with growing urbanisation along rivers and coasts, has resulted in a significant increase in the incidence of destructive flooding and landslides in urban areas. These processes have affected the Liguria/Tuscany coast, where the problems of anthropogenic soil sealing (due to extensive urbanisation, and the increased frequency of heavy rainfalls over the past 10 years) have increased the possibility of landslides, especially along the steep coastal slope.

Project objectives

The aim of the LIFE+ IMAGINE project is to provide coastal area managers with applications that address two scenarios of relevance to the Liguria/Tuscany coast: soil sealing impacts, and flooding and landslide prediction. The applications will be designed according to the Shared Environmental Information System (SEIS) guidelines, following INSPIRE rules, and the process will be interfaced with Global Monitoring for Environment and Security (GMES) infrastructure. Specifically, the project aims to:

- Implement INSPIRE, SEIS and GMES in coastal areas, thereby helping to harmonise heterogeneous spatial information;
- Standardise operational workflows foreseen by the European environmental legislation, making them re-usable and easily extendible to other themes and regional/local authorities;
- Establish a cross-regional monitoring model to be applied in coastal areas;
- Provide decision-makers, planners and stakeholders involved in coastal area risk management with an increased knowledge-base on the implementation of environmental policy and legislation; and
- Increase awareness and acceptance of the benefits of protecting coastal areas.

Expected results

- Demonstration of Open Geospatial Consortium Web Services (OWS) (such as WMS, WFS and CSW) that

LIFE12 ENV/IT/001054

LIFE + IMAGINE



Beneficiary:

Type of beneficiary

Training centre

Name of beneficiary

Geographical Information Systems International Group

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Giorgio SAIO

Duration of project:

36 months (02/07/2013 – 01/07/2016)

Total budget in euro:

1,521,258.00

EC contribution in euro with %:

754,628.00 (50.00%)

Themes: Land-use and Planning: Sensitive and protected areas management / Risk management: Risk assessment and monitoring

are integrated into customised systems and/or applications, allowing for environmental data exchange at different spatial scales and across different systems, platforms and applications;

- An innovative solution, available through a user-friendly 3D client, whereby the user can visually connect components, encapsulating and parameterising complex geo-processing models;
- Workflows and SW tools that transform the datasets into landslide and land consumption scenarios, based on the recalculation of risk analysis models of INSPIRE;
- Monitoring of changes in land cover, land use and related soil sealing;
- Guidelines, workflows, tools facilitating the very complex process of harmonising and validating datasets/metadata according to technical requirements; and
- A collaborative environment in which stakeholders, officials and environmental experts can share their data and work together.

WEENMODELS - Waste Electric and Electronic Equipment - New MODEL for Logistic Solutions

Project background

An estimated 20-50 million tonnes/yr of waste electrical and electronic equipment – commonly known as WEEE or e-waste – are generated worldwide. It is estimated that WEEE volumes in the EU alone will reach 12 million tonnes by 2020. The presence of dangerous components in the equipment causes serious problems in the WEEE management process, with significant risks for the environment and also the loss of valuable resources.

The revised WEEE Directive (2012/19/EU) sets collection, recycling and recovery targets for all types of WEEE. It also sets maximum limits for the presence in new electrical and electronic equipment (EEE) of dangerous substances, such as mercury, cadmium, lead, hexavalent chromium and polybrominated biphenyls (PCB).

Today, most European cities have implemented new WEEE collection systems, which guarantee the proper management of large- and medium-sized equipment. However, collection and separation of small WEEE – dimensions under 50 cm – is still inadequate, particularly through small points of sale, which do not yet comply with EU obligations. As a consequence, a high proportion of WEEE escapes proper management processes.

Project objectives

The WEENMODELS life project aims to demonstrate that, through the application of an efficient logistics system and the central coordination of WEEE collection services, it is possible to reach and even to exceed the targets defined by the WEEE Directive.

Specifically, the project will define and implement a new model of reverse logistics for WEEE aiming to recapture value from the waste stream or proper disposal of those parts that cannot be reused or recycled. The new collection and logistics model should offer a stable and systematic service that minimises service costs.

WEENMODELS life will help develop synergies in the waste management cycle between private and public entities, as well as end users. The project will notably work to build the capacity of new 'experts' within retailers who would be able to identify the possible residual lifecycle of EEE. This should enhance the strategic role of retailers and conveyors in reducing the inappropriate management of WEEE.

LIFE12 ENV/IT/001058
WEENMODELS life



Beneficiary:

Type of beneficiary

Local authority

Name of beneficiary

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Alessandra RISSO

Duration of project:

40 months (02/09/2013 – 31/12/2016)

Total budget in euro:

2,352,505.00

EC contribution in euro with %:

1,038,029.00 (50.00%)

Theme: Waste: Waste from Electrical and Electronic Equipment (WEEE)

Ultimately, the project aims to reduce the amount of WEEE disposed of through unsorted waste streams, thus reducing the risk of illegal or improper disposal of highly toxic substances and related environmental risks. It also hopes to stimulate positive socio-economic effects by promoting new markets linked to the reuse of valuable materials.

Expected results

- Tripling of the present rate of collection of small WEEE by 2016;
- An increase of over 45% in the overall amount of WEEE collected annually by 2016;
- The reconditioning/reuse of 3% of the WEEE through the new logistics system;
- A 10% reduction in operational costs in comparison with current levels;
- A reduction of pollution risk to the environment from hazardous substances; and
- New economic opportunities related to reprocessing and reuse of WEEE materials.

Sanitaryware production: use of waste glass for saving energy and resources

Project background

It is widely acknowledged that some of the best quality vitreous china sanitary ware comes from Europe, and, in particular, from Italy and Germany. The European ceramics' sanitary ware sector employs around 22 000 people directly and has an annual turnover of €4.5 billion. The industry is characterised by the concentration of large, multinational groups, as well as by the vertical integration of SMEs. The main challenges faced by the sector are related to resource use and energy consumption. Environmental problems related to the production processes include:

- High consumption of raw materials coming from domestic and foreign mines and quarries;
- High consumption of energy for ceramic production processes, such as firing of vitreous sanitary ware, resulting in a significant impact in terms of CO₂ emissions; and
- High usage of water and domestic cleaning agents (both natural and synthetic) due to the anti-bacteria action of new glazes.

Project objectives

The LIFE SANITSER project aims to revise the vitreous sanitary ware (VSW) production process by introducing relevant amounts of glass cullet from urban waste disposal into the ceramic blend formulations. The project's process innovations are designed to: i) contribute to sustainable waste management, in terms of the recovery of large amounts of glass cullet waste (soda lime glass – SLG); ii) improve the environmental performances of the ceramic sanitary ware sector by reducing CO₂ emissions; and iii) reduce the consumption of energy and natural resources.

To date, little use has been made of SLG in VSW production, although its introduction would deliver significant benefits. The replacement of feldspar-like materials (by up to 40-50%) or fluxagents (up to 40-50%) with SLG would provide savings in natural resources (often imported because of their increased scarcity in Europe, so also reducing fuel and emissions for transport), as well as reducing energy consumption and CO₂ emissions during production.

The introduction of SLG will also allow for a lowering of the firing temperatures by 80-110°C (from 1230-1250°C to 1120-1150°C), and for a reduction in soaking times by 20%. The related CO₂ emissions reduction will be quantified through the Life Cycle Assessment.

LIFE12 ENV/IT/001095
LIFE SANITSER



Beneficiary:

Type of beneficiary

SME Small and medium sized enterprise

Name of beneficiary

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Name of contact person

Tiziano MESTRINER

Duration of project:

45 months (01/07/2013 – 31/03/2017)

Total budget in euro:

2,298,282.00

EC contribution in euro with %:

1,075,565.00 (50.00%)

Theme: Industry-Production: Non-metallic minerals

Expected results

By the end of the project, many of the technological hurdles hampering the introduction of SLG in VSW production will have been addressed. Some of the main expected results include:

- Proof of the technical feasibility of substituting around 50% of feldspar, saving natural resources and helping to preserve the landscape;
- A reduction of at least 16-18% in energy consumption, and of at least, 16-18% in CO₂ emissions – achieved by lowering the ceramic firing temperatures by 80-110°C and shrinking soaking times;
- A reduction in production costs – thereby increasing industry competitiveness and promoting a shift to technology-driven manufacturing;
- Savings of 120 t of primary raw materials (feldspar, quartz) over the project life time, enabling similar amounts of SLG waste to be recycled; and
- Reductions of 1.3 t of CO₂ emissions by avoiding the transport of primary raw materials.

CO₂ emissions and energy consumption reduction of an Electric Arc Furnace through dynamic thermal balance monitoring

Project background

An electric arc furnace (EAF) is used to convert recycled steel (scrap) to fresh liquid steel. Although recycling steel in an EAF is a lot less energy consuming than the classical steelmaking route (from iron ore over blast furnaces and basic oxygen furnaces to liquid steel), an EAF based steel plant is still a large electrical and fossil energy consumer, responsible for high direct and indirect CO₂ emissions. Currently, about 5% of the energy lost as heat could be recovered with existing technologies, and a further 30% could be recovered if the temperature of the waste heat source could be increased. The remaining 65% could also be recovered by developing new technologies to capture and accumulate the lost heat.

The beneficiary believes, nevertheless, that energy saving technologies used at source (beginning of the process) should have priority over energy recovery at the end of the process. To recover the EAF energy lost and significantly reduce its CO₂ emissions, an accurate identification of the thermal and chemical losses, coming from the very hot off-gases, and the intense water-cooling of the furnace vessels (panels, roof, and bottom), are required.

Project objectives

The main objective of the LIFE GREEN EAF project is to develop and test an innovative and high-performance off-gas analysis system (measuring CO, CO₂, H₂, O₂, H₂O, N₂, Ar, He, and flow and fume temperatures) and to improve the existing production system.

Based on the information gathered, the EAF process will be modified in order to optimise a “dual shell” EAF process, which will reduce heat losses, making the process more energy efficient and lowering direct and indirect greenhouse gas (GHG) emissions by around 6%. This will be achieved through the definition of innovative models and, if possible, automated control strategies will be developed, taking into account the specificities of dual-shell operation.

Expected results

The dual shell DC EAF of Differdange will have a production capacity of 2x155 tonnes (t) of liquid steel per heat; its total specific energy input is thus quite high. The expected CO₂ emissions reduction will correspond to 5.9% of the cumulated (direct + indirect) CO₂ emissions, corresponding to 23 kg of CO₂/t of liquid steel produced

LIFE12 NAT/LU/000360
LIFE GREEN EAF



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Name of contact person

Jean-Claude BAUMERT

Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

1,230,830.00

EC contribution in euro with %:

505,103.00 (50.00%)

Theme: Industry-Production: Metal industry

(of which 12 are direct emissions and 11 indirect emissions). This will result in a reduction in emissions from 390 kg CO₂ / t steel to 367. These savings represent almost 30 000 t of CO₂ per year.

These direct CO₂ emissions reductions correspond to a decrease in the use of fossil energy and raw materials: anthracite, foaming carbon, electrodes, and natural gas. The breakdown of these reductions will be as follows:

- 22% for anthracite (i.e. saving 6 Kg CO₂ per t of steel);
- 10% for foaming carbon (i.e. saving of 2 Kg CO₂ per t of steel);
- 9% for electrodes (i.e. saving of 1 Kg CO₂ per t of steel); and
- 15 % for natural gas (i.e. saving of 3 Kg CO₂ per t of steel).

Constructing two demonstration green roofs to illustrate the potential of meeting environmental and energy targets

Project background

An increase in energy demand has contributed to the increase in the 'heat island effect', air pollution and flooding, resulting in unnecessary pressure on urban dwellers. It is for this reason that the EU's Europe 2020 Strategy aims to reduce energy requirements by at least 20% by 2020. The Commission's Energy Efficiency Plan 2011 identified buildings as having the greatest potential for energy savings.

Green roofs also have a role to play in rendering buildings more energy efficient. In Malta, however, the use and uptake of green roofs has been very low because of misconceptions around issues such as leaks. Information on the technology is sorely lacking. Although various green roof standards provide guidelines, the exact composition will be determined by the types of plants to be grown, the climatic conditions, weight loads and drainage requirements. Achieving a correct mix that addresses the requirements of climatic conditions is crucial to the success of a green roof. The Mediterranean climate is quite particular and plants native to the region could prove appropriate for use in green roofs. Most often the sedum species used are not native to the Mediterranean and as such sustain limited biodiversity. As a result native species for green roofs are a preferred option.

Project objectives

The LifeMedGreenRoof project will construct two demonstration green roofs as case-studies: on the University of Malta's Faculty for the Built Environment campus building and one on a building located on the campus of Fondazione Minoprio (a project partner) in Italy. The roofs will demonstrate the benefits of green roofs for meeting environmental and biodiversity targets. The project will also show that green roof technology is safe and cost efficient, reducing energy consumption thanks to the insulation properties of the system. Green roofs reduce the risk of flooding through the ability of the growing medium to absorb water.

Specific project objectives include:

- Creating a growing medium, preferably locally sourced and ideally from industrial waste;
- Studying the adequacy of native and locally grown plants in a green roof environment;
- Recording and demonstrating the cooling and insulation effects of green roofs in a semi-arid climate;
- Recording and demonstrating the storm water man-

LIFE12 ENV/MT/000732

LifeMedGreenRoof



Beneficiary:

Type of beneficiary

University

Name of beneficiary

University of Malta

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Name of contact person

Alex TORPIANO

Duration of project:

49 months (01/07/2013 – 31/07/2017)

Total budget in euro:

837,647.00

EC contribution in euro with %:

414,072.00 (50.00%)

Theme: Industry-Production: Building

agement qualities of green roofs and the possible effects on local flooding;

- Developing/improving national guidelines for the construction of green roofs;
- Drafting a national planning strategy for green roofs; and
- Identifying possible barriers and providing technically and economically-viable solutions for large-scale introduction.

Expected results

The project expects to achieve the following results:

- Identification of local materials adequate as growing media;
- Identification of suitable native plants;
- Creation of two demonstration green roofs;
- Publication of data on insulation properties;
- Publication of data on storm-water management;
- Drafting and revision of national guidelines for Italy; and
- Drafting of proposed policies for the Maltese planning system.

Demo installation of electricity/ heat COGENERATION with gasifi- cation of fuel based on municipal waste and sewage sludge

Project background

In Poland, volumes of solid waste and sewage sludge are increasing, and landfilling is the most common approach to waste management, accounting for 80% of waste disposal. Both municipal solid waste and sewage sludge, however, have high energy recovery potential and according to the EU Directives 2006/12/EC or 1999/31/EC, municipal solid waste and sewage sludge should be minimised, re-used, recycled or incinerated with energy recovery – before disposal to landfill sites.

Other EU countries, such as Austria, the Netherlands, Sweden, Denmark and Belgium have made good progress in this area. Poland has introduced a ban on the storage of waste with a calorific value above 6MJ/kg and the Polish National Waste Management Plan (2010) requires the complete phasing out of sewage sludge storage from 2013.

Implementation of this plan is difficult for small and medium-sized municipalities, where the volume of waste and sewage sludge is too small to warrant the construction of a waste incinerator. A potential solution is small-scale dispersed energy generation from local sources.

Project objectives

The overall objective of the LIFE COGENERATION PL project is to demonstrate the operation of an innovative technology for managing the energy fraction of municipal waste and sewage sludge. The technology consists of a unique gasification process and a highly efficient system for the production (cogeneration) of electricity and heat. Gasification is a method of producing gas by subjecting certain materials to high temperatures (>700°C), without combustion, with a controlled amount of oxygen and/or steam. This gas is then used as a fuel.

The specific objectives are to:

- Construct a pilot-scale prototype demonstration plant that integrates five technological units: fuel preparation, gasification, syngas purification, syngas combustion, the production of electricity and heat, and exhaust gases purification. The plant, which will use technology developed by the project, will have the potential for application on an industrial scale, with the following parameters: electric power output of 1.8 MW, thermal output of 5 MW and a capacity of 20 000 Mg/year; and
- Test and validate the technology at the demonstration scale in order to verify assumed specifications and functionality.

LIFE12 ENV/PL/000013
LIFE COGENERATION PL



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Name of contact person

Arkadiusz PRIMUS

Duration of project:

48 months (01/07/2013 – 30/06/2017)

Total budget in euro:

3,826,043.00

EC contribution in euro with %:

1,756,718.00 (49.03%)

Themes: Climate change – Energy: Energy supply / Waste-Municipal waste (including household and commercial)

Expected results

The prototype plant will have a maximum processing capacity of 25 000 tonnes of waste per year, generating the following amounts of energy:

- Fuel with energy potential of 1.3 MW;
- Electric power: 180 kWh;
- Thermal power: 250 kWh.

Air Pollution and biometeorological forecast and Information System

Project background

Air pollution significantly affects quality of life. In developed countries critical concentrations of particulate matter (PM), ozone (O₃) and heat-stress have a damaging impact on health and the environment. Many studies have also demonstrated the connection between PM and rates of hospitalisation, chronic obstructive pulmonary disease and premature death. According to data published by the World Health Organisation, the average life expectancy in Poland is 10.7 months shorter because of air pollution.

Therefore, it is necessary to build up knowledge of the complex interactions between pollutants, weather conditions and human health. Activities in this area should include complementary issues, such as long-term monitoring of human health and the quality of the environment, including the use of spatial modelling methods for air quality and the creation of short-term forecasts of exposure to high concentrations of pollutants. Information obtained as a result of modelling and forecasting can be used to support environmental management in order to improve the state of the environment, reduce risks to human health and improve living conditions.

Project objectives

The objective of the LIFE APIS/PL project is to minimise the negative impact of air pollution on public health by developing a new air pollution management and information system. This new tool will combine different existing meteorological models and risk assessment methods, providing useful information to better control and monitor air quality. The main aim is to provide decision-making bodies and local citizens with necessary information and warnings about air quality and its forecasted impact. This system will provide a toll for controlling air quality and efficient environmental planning.

The project will create an information and warning system for the public that includes air pollution, meteorological and bio-meteorological conditions. This objective will be achieved through the design and implementation of an air quality modelling system and a communication system about risks. A support system will also be established for air quality management.

Expected results

The project will help to improve air quality and public health by:

LIFE12 ENV/PL/000056
LIFE-APIS/PL



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Name of contact person

Anetta DRZENIECKA-OSIADACZ

Duration of project:

48 months (01/10/2013 – 30/09/2017)

Total budget in euro:

1,049,024.00

EC contribution in euro with %:

523,412.00 (50.00%)

Themes: Air and Noise: Air quality monitoring / Risk management: Human health protection

- Enabling a 3-5% reduction in the emission of air pollution;
- Permitting emission reduction during adverse weather conditions;
- Reducing the number of days on which the limit value is exceeded (by >10% days per year);
- Applying a pollution and biometeorological forecast system throughout Lower Silesia;
- Creating an information system for current weather conditions and air quality that can be accessed online by local citizens or at information points;
- Identifying areas where actions on air quality should be implemented;
- Reducing air quality-related health risks by warning the population about acute pollution episodes or about harmful meteorological conditions (e.g. heat waves);
- Providing parameters for the updating of the zoning plan; and
- Raising public awareness about the impact of pollution.

Tailoring hybrid membrane processes for sustainable drinking water production

Project background

Anthropogenic pressures and climate change are responsible for severe variations in fresh water availability and quality, and for the degradation of water sources by emerging contaminants that are of environmental-health concern because of their toxicity, mutagenicity and/or endocrine-disrupting behaviour. These include personal care products and pharmaceuticals; pesticides from agriculture; and cyanotoxins produced by toxic cyanobacterial (blue-green algal) blooms.

Such emerging contaminants are often dissolved organics, of intermediate-to-low molar mass, commonly present in very low concentrations (micro-contaminants). As such, conventional wastewater treatment plants and processes do little to remove them.

Project objectives

The LIFE HyMemb project's general objective is to demonstrate the feasibility and sustainability of advanced membrane processes for the treatment of drinking water, in order to provide a safer, more resilient barrier against emerging contaminants, with lower environmental impacts.

Specific objectives include:

- Developing an innovative hybrid process, using a low-pressure ceramic membrane (microfiltration - MF) and powdered activated carbon (PAC);
- Conducting a two-year field test of a PAC/MF prototype, to demonstrate its effectiveness, reliability and efficiency and to compare the advanced process with conventional treatment processes;
- Drafting recommended guidelines [for several Portuguese and European surface drinking water scenarios] on PAC/MF application for safe EU control with a reduced carbon footprint, i.e. with a 15% decrease in the consumption of chemicals and of sludge production, keeping energy consumption to a minimum; and
- Carrying out a cost-benefit analysis of the process using field data gathered during the project, as well as social indicators of stakeholders' attitudes towards membrane processes. HyMemb therefore expects to identify potential opportunities for using PAC/MF technology in drinking water treatment.

Expected results

The project expects to achieve the following results:

- To optimise the operating conditions of the hybrid

LIFE12 ENV/PT/001154

LIFE HyMemb



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Name of contact person

Maria João ROSA

Duration of project:

36 months (01/01/2014 – 31/12/2016)

Total budget in euro:

631,046.00

EC contribution in euro with %:

282,678.00 (45.55%)

Theme: Water: Water quality improvement

PAC/MF for effectively removing the emerging contaminants targeted, while minimising membrane fouling - thus increasing the technology's productivity and lifetime. The aim is to obtain a significant decrease (15% target) in chemicals consumption and sludge production, and to keep energy consumption to a minimum in comparison with optimised conventional treatment systems;

- The development of comprehensive technical guidelines for upgrading conventional drinking water treatment with PAC/MF and for its application Europe-wide;
- To identify the main values, beliefs and attitudes towards membrane processes and build a SWOT analysis on the use of PAC/MF for drinking water production;
- To build bridges between engineering and social dimensions for an effective technology transfer from R&D institutions to end-users; and
- To quantify the environmental, economic and social impacts of each technology studied.

Elimination of impacts of geological component of environment on health status of Krupina district population

Project background

Geochemical conditions can have positive and negative impacts on human health. In Slovakia, studies indicate that inhabitants of Krupina county are adversely affected by the neogen vulcanite rocks. These reduce the availability of key biogenic chemical elements such as Ca, Mg, Se, Al, Zn (all of which are needed for human health). The concentrations of these elements in Krupina's soils and groundwater are approximately half the level of other regions in Slovakia. A low level of these elements can lead to different health issues linked to, for instance, the endocrine glands or the cardiovascular system.

Project objectives

The main objective of the project is to improve the health of residents of Krupina district. To do this it will confirm the links between health issues and geological conditions. Knowledge gathered by the project will be used to inform appropriate mitigation measures for reducing health risks from geological conditions.

Specific project actions include:

- Gathering of data for environmental indicators (chemical elements/components) concerning soils, groundwater and drinking water; and
- Gathering of new data on health indicators (indicators of demographic changes and the health of the population);

By linking these two datasets, the project will be able to assess the impact of the geological environment on the health of the resident population.

In addition, the project team will:

- Analyse chemical contents of critical elements (e.g. Ca, Mg, Se, I, Ba, Zn and others) in various biological materials (blood, urine, hair, nail, milk-tooth) to confirm the relationship between the geological environment and the health of Krupina's residents;
- Carry out an evaluation of lifestyle factors and access to health care among residents; and
- Define limit values for soils and drinking and groundwater, as well as maximum acceptable levels and minimum levels necessary for human organisms.

Through these actions, the project will design and implement measures for minimising negative influences of Krupina's geology. Implementation actions will focus mainly on education, training and legislative work. Special attention will be paid to identifying appropriate technological solutions.

LIFE12 ENV/SK/000094

Life for Krupina



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Stanislav RAPANT

Duration of project:

48 months (01/10/2013 – 30/09/2017)

Total budget in euro:

417,750.00

EC contribution in euro with %:

201,153.00 (49.59%)

Theme: Risk management: Human health protection

Expected results

The project expects to contribute to a general improvement of residents' health status. Other outcomes will include:

- Clarification, compilation and monitoring of data concerning interrelated environmental and health indicators;
- Defining of limits of all environmental indicators based on their influence on human health as a background for legislative implementation in relevant guidelines;
- Proposal of measures aimed at reducing unfavourable impacts from the geological environment on human health; and
- Environmental-health education for the people of Krupina.

Nanoremediation of water from small waste water treatment plants and reuse of water and solid remains for local needs

Project background

The availability of drinking water of suitable quality and in sufficient amounts is fundamental to food production, industrial activities and public health and sanitation. Anthropogenic climate change already causes incidents of water scarcity and drought in Europe.

In April 2009, the European Commission presented the White Paper, 'Adapting to climate change: Towards a European framework for action', which represents a framework for the adjustment of measures and policies to reduce the EU's vulnerability to climate change. According to this document, the frequency and intensity of drought have increased dramatically over the last 30 years: the surface area and the population affected by drought has increased by 20% and costs attributable to droughts have increased to €100 million. It is also estimated that at least 11% of the European population and 17% of its territory are threatened by drought. Improved management of water resources and ecosystems is thus necessary to increase their resilience to climate change.

Project objectives

The project will test an innovative nanoremediation process to treat urban wastewater and to recycle sludge as different types of composites. This new zero solid waste process will target household wastewater that is too polluted to be released into surface waters. The treated water will be used for secondary purposes in households and for common public needs.

This new technology is based on the use of nanoparticles of zerovalent iron and will be implemented directly in small-scale return-loop plants in households. It will also demonstrate the use of recycled sludge from a small-scale urban wastewater treatment plant and sediment from a nanoremediation tank in different types of composites.

Expected results

The project expects to achieve the following results:

- A reduction of drinking water consumption of up to 30% through the development of a return-loop of treated urban wastewater in the Slovenian municipality of Šentrupert;
- A 117-litre reduction of drinking water consumption in favour of using remediated water, through a return-loop connected to a small-scale wastewater treatment plant for households. For a population of

LIFE12 ENV/SI/000443
LIFE RusaLCA



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Name of contact person

Alenka MAUKO

Duration of project:

42 months (01/07/2013 – 31/12/2016)

Total budget in euro:

852,388.00

EC contribution in euro with %:

426,192.00 (50.00%)

Themes: Risk management: Site rehabilitation – Decontamination / Water: Waste water treatment

100 inhabitants, this would equate to a reduction in drinking water consumption of at least 3 500 litres per day or 1 277 000 litres per year;

- Up to 70% of the remediated water will be made available to inhabitants for secondary purposes via the return-loop system. This translates as some 58 litres of additional water per capita for secondary purposes; and
- One-third of the remediated water - or up to 24 litres per day per capita - will go towards various public uses, such as irrigation and watering of green areas and fire-fighting.

Innovative technology for cyanobacterial bloom control

Project background

Cyanobacteria can be found in almost every terrestrial and aquatic habitat. Aquatic cyanobacteria are known for their extensive and highly visible blooms that can form in both freshwater and marine environments. The massive blooms can be toxic and frequently lead to the closure of recreational waters when spotted.

Therefore, mass occurrence of cyanobacteria is a major health risk in the EU. Most of the cyanobacterial blooms produce highly toxic cyanotoxins which pose a threat during mass occurrences; the collapse of the bloom causes a release of cyanotoxins in the aquatic environment. Cyanobacterial blooms occur as a result of eutrophication of water bodies. Elimination of this cause is expensive and time consuming. It is therefore necessary to find a way of preventing blooms forming in spite of the conditions of the water body.

Project objectives

The objective of this project is to demonstrate a new system for triggering lysis (break down) of cyanobacteria, decreasing its concentration and preventing mass blooming. This new technology, which will be implemented through a pilot device on two selected water bodies, will not destroy the entire population of the bacteria. It will simply prevent its mass occurrence.

The project will also test new online sensors that determine concentrations and detect certain physical and chemical parameters of cyanobacteria in water bodies. This system simultaneously transfers the measured data via a GSM network.

Programmes for interpreting measured data will also be designed. Data will be available on the project website. The device will also collect and store samples for laboratory analysis. Using the new technology will improve the ecological status of the chosen water bodies.

Expected results

The project expects to achieve the following results:

- After triggering the lysis of cyanobacteria, the concentration will decrease to around 90% of the initial concentration;
- A 50% lower concentration of toxic cyanobacteria in the period in which the cyanobacterial blooms usually develop;

LIFE12 ENV/SI/000783
LIFE Stop CyanoBloom



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Name of contact person

Marko GERL

Duration of project:

42 months (01/07/2013 – 31/12/2016)

Total budget in euro:

1,300,963.00

EC contribution in euro with %:

648,792.00 (49.97%)

Themes: Risk management: Human health protection /
Water: Water quality improvement

- The absence of microcystins in the water body during the test period;
- Improved ecological status of the chosen water bodies – i.e. increased biodiversity and a greater number of species of phytoplankton; and
- Reduction of the turbidity of the water body during the implementation period.

Demonstration of innovative soil washing technology for removal of toxic metals from highly contaminated garden soil

Project background

Soil pollution is one of the main environmental problems in Europe and worldwide. Heavily polluted soils represent a serious threat to public health. They cause pollution of groundwater, hamper the functionality and health of agricultural areas, and reduce biological diversity. European Commission data indicate that 16% of the EU land area is affected by degradation. Hence soil remains one of the top priorities of EU environmental policy.

In the Upper Mežica Valley, the soil is heavily polluted with lead and other toxic metals due to centuries of mining. It has been estimated that around 350 000 m² should be cleaned in order to ensure a healthy living environment for local inhabitants.

The urgent need for viable, sustainable remediation technology is most critical for soils contaminated with toxic metals such as Pb (lead) and Cd (cadmium) because existing technologies are only partially successful.

Project objectives

The LIFE ReSoil project will demonstrate an innovative technology for soil washing that removes most toxic metals and organic pollutants. Metals are removed after complexation with chelant ethylenediamine tetraacetate (EDTA). This method is soil friendly and enables reuse of remediated soil as a plant substrate. However, to date it has only been tested at a laboratory or pilot scale. The main project objectives are:

- To scale-up this technology to enable large-scale remediation of soils;
- To assure the cost-effectiveness of the new technology - under 50 €/t for treatment of heavily polluted soil (over 5 000 mg Pb/kg);
- To prepare a priority remediation list of contaminated locations in the Upper Mežica Valley; and
- To upgrade the technology for treatment of soils dually contaminated with both toxic metals and organic pollutants.

Expected results

1. The design, construction and successful operation of a pilot remediation plant with a capacity of 6 tonnes of soil per day. After 26 months of operation 2 340 tonnes of contaminated soil will be remediated and 7500 m² of land reclaimed;
2. The successful demonstration of the use of remediated soil for the safe home production of vegetables;

LIFE12 ENV/SI/000969
LIFE ReSoil



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Name of contact person

Neža FINŽGAR

Duration of project:

50 months (01/07/2013 – 31/08/2017)

Total budget in euro:

2,256,709.00

EC contribution in euro with %:

1,128,354.00 (50.00%)

Theme: Risk management: Site rehabilitation - Decontamination

3. An assessment of the social, economic and environmental impact of the project.
4. Confirmation of the feasibility of future full-scale facilities using this novel technology and an assessment of the total cost of soil remediation;
5. A detailed financial and operational plan for soil remediation in the Upper Mežica Valley, beyond the project's duration (to be used by local and national decision-makers for further actions);
6. The setting up of the remediation plant in an urban area, with minimal environmental impact and long-term operation potential, creating new permanent jobs for the local population; and
7. Confirmation and benchmarking of the new soil remediation technology as the best-available technique for soils (especially garden soils) contaminated primarily with toxic metals.

Self-sustaining Urban Roads: A way to improve Environmental performance of urban areas

Project background

The construction of roads produces several specific environmental challenges. The OECD estimates that 10 000 m³ of aggregates are needed for each km of two-lane road and large amounts of fossil fuels are consumed. Road construction is thus associated with the consumption of raw materials and the generation of a number of air pollutants, including particulate matter (PM), nitrogen oxides (NO_x), sulphur oxides (SO_x), carbon monoxide (CO), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and carbon dioxide (CO₂).

Project objectives

The LIFESURE project aims to minimise the consumption of natural resources in road construction by producing and demonstrating the effectiveness of an innovative eco-friendly technology for manufacturing eco-asphalt on site. Through this technology it is hoped to be able to reduce the consumption of raw materials and fossil fuels and make a contribution to the creation of more sustainable cities with an improved quality of life.

It aims to develop a prototype of an on-site asphalt plant using reclaimed asphalt pavement (RAP) as raw material. It targets the manufacture of half-warm - manufacturing temperature <100°C - mix asphalt using either 50% or 100% RAP. As a specific technical target it aims to validate the viability of implementing LIFESURE eco-asphalt with only 0.03 tonnes (t) of binder added per t of asphalt mixture and without additional natural aggregates.

The project aims to demonstrate that use of LIFESURE eco-asphalt can feasibly create self-sustaining urban roads. It will test a total of 18 000 m² of low-speed (<50 km/h) road with 100% RAP eco-asphalt in surface and binder layers against standard hot-mix asphalt both on a test track and in the real conditions of a Madrid street. Evaluation will include a lifecycle assessment comparing LIFESURE eco-asphalt and conventional hot-mix recycling asphalt.

The project hopes to demonstrate that LIFESURE eco-asphalt can improve the environmental performance of urban roads, reducing greenhouse gas emissions and noise pollution, whilst reducing costs for road authorities. To encourage the long-term use of its eco-asphalts, the project will develop a network of contacts interested in the concept and draft recommendations for Green Public Procurement (GPP) in road construction.

LIFE12 ENV/ES/000072
LIFESURE



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

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António RAMÍREZ

Duration of project:

58 months (01/09/2013 – 30/06/2018)

Total budget in euro:

2,376,248.00

EC contribution in euro with %:

1,186,040.00 (50.00%)

Theme: Land-use and Planning: Transport planning -
Traffic monitoring

Expected results

- Production of 3 279 t LIFESURE eco-asphalt;
- Reduction in consumption of natural aggregates at demonstration sites by 2 531 t and consequently the avoidance of 5 062 kg eq. CO₂;
- A 62% reduction in greenhouse gas emissions because of the reduction of the manufacturing temperature by 70°C – equating to 72 000 kg eq. CO₂;
- A 35% reduction in binder consumption - equating to 65.6 t binder;
- A 20% reduction in noise in the area around the test sections;
- Valorisation of 3 554 t reclaimed asphalt pavement (RAP);
- Demonstration of the self-sustainability of low-speed (<50km/h) urban roads constructed with eco-asphalt; and
- A 66% reduction in the cost per t asphalt for 100% RAP eco-asphalt and a 51% reduction in the cost of 50% RAP eco-asphalt.

14 sustainable dwellings using local resources as Posidonia plants at the Social Housing Development in Formentera

Project background

There has been much awareness developed in recent years on the importance of energy-efficient buildings, including the use of insulation, solar panels and efficient lighting systems. However, more attention is needed on the emissions generated during the construction phase.

The manufacture of concrete is currently responsible for 75% of the emissions from the construction sector. There is a need to consider alternative building systems that can reduce CO₂ equivalent emissions. An interesting option is the use of *Posidonia oceanica* (Neptune grass) a seagrass endemic to the Mediterranean. On the Balearic island of Formentera, it has been traditionally used in multiple applications, including the thermal insulation of buildings.

Project objectives

The project aims to demonstrate the feasibility of developing a multifamily residential building with a significantly reduced ecological footprint. It aims to reduce energy and water consumption and the production of waste during the construction phase and service life of the buildings.

It proposes a model of hyper-local architecture, linking environmental issues with the cultural tradition of the region and restoring traditional local architectural techniques. It will implement and evaluate alternative construction techniques for a building with a total floor area of 1 083 m². Specifically, it will test Neptune grass packed in re-used pallets as insulation material and non-reinforced lime concrete in the foundations.

The project will also introduce measures to reduce energy, water and waste consumption. It will implement passive energy-saving systems using natural sea breezes to control heat in the summer. An efficient active system will be introduced to optimise heating in the winter using renewable energy sources – including facilities for biomass. Water consumption and waste generation will be minimised by facilities to harness rainwater and recycle waste.

The project will test and assess these construction techniques to ensure that they meet the necessary technical requirements of the building. It will also ensure that they do not imply significant increases in cost or time delays for the constructor. The project thus hopes to demonstrate the feasibility of more environmentally-friendly forms of construction that can both reduce the emission of greenhouse gases and improve the quality of city landscapes.

LIFE12 ENV/ES/000079
LIFE REUSING POSIDONIA



Beneficiary:

Type of beneficiary

Regional authority

Name of beneficiary

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Name of contact person

Roberto María CAYUELA REXACH

Duration of project:

48 months (01/08/2013 – 31/07/2017)

Total budget in euro:

1,580,873.00

EC contribution in euro with %:

754,012.00 (47.83%)

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Industry – Production: Building

Expected results

The project's expected results include:

- A 50% reduction in CO₂ emissions during the construction phase – equivalent to some 300 kg/m² or a saving of nearly 325 000 kg of CO₂ for the test building;
- Demonstration of the thermal conductivity of Neptune grass-based insulation in the target range of 0.40 – 0.45 W/mK;
- Demonstration of resistance of at least 5 KN/m by the non-reinforced lime concrete used in the foundations;
- Achievement of an Energy Class A rating for the developed building – with a target of some 2.8 Kg CO₂/m²/yr;
- Reduction in energy consumption during use of the building by 75%, reaching a maximum energy consumption of 15 kWh/m²/yr; and
- A maximum mains water consumption of 88 l/person/day..

Quick urban forestation

Project background

The construction of new residential zones - and industrial zones surrounding large capitals - is typically characterised by rapid urban planning in which very few green spaces are included. The dry climates of southern Europe are especially challenging for the quality of soils, air and water, with desertification a real threat and the water requirements for restoring green spaces high.

The result is often cities with arid conditions, surrounded by industrial zones of polluted or very poor soil, with almost no vegetation, sometimes placed in valleys affecting air quality. The CO₂ balance and air pollution in these areas is among the worst in Europe.

Project objectives

The life-QUF project aims to promote the reforestation of southern European cities through the design and development of a key demonstration project in the Spanish city of Valladolid. It hopes to test and demonstrate the feasibility of combining forestation-related techniques to make an important contribution to the improvement of the quality of life and environment of the arid urban areas of southern Europe.

The project will test the effectiveness of water retainers and mycorrhiza for enabling tree growth without any additional water infrastructure. It will plant 30 000 trees in four groups to test the benefits of the proposed techniques: with water retainers; inoculated with mycorrhiza; combining mycorrhiza and water retainers; and a control group. All four groups will be monitored using a network of sensors.

The project aims to publish a final document setting out rules, recommendations, methods and techniques for obtaining the best benefits of using mycorrhiza and water retainers to promote reforestation of different types of soil. The document will include information on the experiments conducted within the project and results achieved and the cost of the techniques recommended. It will be made available to all relevant cities.

The project will also create a network of 'green' southern European cities known as the GSEC Group. This will exist to encourage the exchange of experiences and learning around quick reforestation of arid and polluted environments. It will also create a pressure group to support legislative and funding decisions to encourage reforestation techniques around arid cities.

LIFE12 ENV/ES/000092

life-QUF



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Name of contact person

Elisa DE LA NUEZ

Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

1,356,782.00

EC contribution in euro with %:

620,750.00 (49.95 %)

Themes: Climate change – Energy: Adaptation to climate change / Land-use and Planning: Urban design (urban-rural)

Expected results

- The planting of 30 000 trees in the south of Valladolid;
- A 95% survival rate for trees planted without water infrastructure;
- A survival rate at least 30% higher than when using no technology, with a corresponding improvement in biodiversity and soil quality;
- A 20% increase in the average tree biomass, with a corresponding increase in CO₂ absorption;
- Capture of at least 6 t CO₂ during the first two years of the project, with significantly higher capture in subsequent years;
- A 10% reduction in noxious gases and particles in the atmosphere (CO, lead, etc.);
- An increase of at least 1% in organic matter in soil;
- The publication of a guide to reforestation of arid areas; and
- The creation of the GSEC Group, a network of Green Southern European Cities.

Valorisation of Waste Water Treatment Plants and aggregates processing sludges for lightweight aggregates production

Project background

Wastewater treatment plants (WWTPs) in the EU generate ever-increasing amounts of sludge waste. The use of sludge from WWTPs for the fertilisation of farming soils has become relatively widespread because of the richness of its organic components. However, the European Sewage Sludge Directive (86/278/EEC) has set limits on this form of valorisation, because the sludge also has a high content of heavy metals, which contaminate the natural environment.

The mining industries also generate large amounts of sludge waste from the process of washing extracted aggregates. This contains particles of such small size that the sludge is largely liquid, which significantly limits its potential applications.

Project objectives

The LIFE Sludge4Aggregates project aims to demonstrate the viability of the valorisation of sludge from both WWTPs and the aggregate extraction process. It specifically hopes to develop a new artificial, lightweight aggregate from the sludge that can have industrial applications.

The project will apply a new technology based on the treatment of different mixtures of the mining and WWTP sludge wastes to obtain new and inert low density ceramic products. The project will design and develop a pilot plant for the production of these new artificial lightweight aggregates, including defining the necessary technological and environmental parameters for the process.

The project will then work to achieve technological and environmental validation of both the process and the final product through product application and lifecycle analysis. This will include demonstration of conformity with required quality and environmental parameters to meet national and European legislation – notably around resistance to physical and chemical degradation and the avoidance of dangerous emissions during manipulation.

It hopes to show potential uses of the new product in sectors including construction, infrastructure and horticulture, both valorising a current waste stream and reducing the need for 'new' lightweight aggregates in these sectors. The project thus hopes to reduce the amount of contaminated sludge waste requiring expensive or environmentally-damaging management solutions, extending the lifecycle of existing aggregate material and reducing the need to extract raw materials, particularly clays.

LIFE12 ENV/ES/000123
LIFE Sludge4Aggregates



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Name of contact person

Agripino PÉREZ LORENZO

Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

1,515,265.00

EC contribution in euro with %:

757,632.00 (50.00%)

Theme: Waste: Waste use

Expected results

The project expects to achieve the following results:

- Demonstration of an innovative process for producing lightweight aggregates using sludge from WWTPs and the extractive industries;
- Confirmation that the high metals content of the sludge is rendered inert inside the new lightweight aggregate;
- Valorisation of the new lightweight aggregate in different sectors of activity;
- Reduction of the volume of WWTP and mining sludge going to landfill;
- Less extraction of new raw materials – clay – for lightweight aggregate production; and
- A reduction in the costs and an increase in the competitiveness of companies valorising the sludge waste streams.

Boosting Health Sector to reduce its environmental impact using an innovative decision-making process based on LCA/LCC

Project background

Healthcare centres and hospitals consume significant amounts of resources, particularly energy and water. These establishments also produce a lot of very different types of waste. This includes wastewater, food and packaging waste, as well as (potentially) hazardous, infectious and radioactive wastes. Air emissions are also generated as a result of energy consumption.

The priority for hospitals has been, understandably, to focus on healthcare performance inside the hospital above other considerations. However, approaches which only focus on removing waste from the hospital or delivering a particular outcome inside the hospital can produce significant environmental impacts outside.

Project objectives

The LIFE BOHEALTH project aims to reduce the environmental impact of health services by showing their real environmental and economic impact over their entire life cycle. It aims to support health service managers in reducing the environmental impacts associated with these services through the development of Sustainable Action Plans.

The project will develop a practical approach to supporting the decision-making process of health service managers, based on the PDCA (Plan-Do-Check-Adjust) method. It will:

- Identify the “key performance indicators” (KPIs) and “functional units” that best fit health sector characteristics, in order to monitor and control these aspects;
- Use Life Cycle Assessment (LCA) and Life Cycle Costing (LCC) methodologies to identify, quantify, prioritise and monitor environmental impacts, and to highlight hidden or external costs;
- Identify the Best Available Techniques (BATs) that can be applied to reduce these impacts, based on technical, environmental and economic assessments; and
- Develop a web-tool application to facilitate the selection of the most appropriate interventions for each participating health centre.

Through this work, the project expects to support, with quantitative data, the definition of “Sustainable Action Plans” for application in each participating centre. This will then enable a clear and quantitative comparison between the before and after situation - from an economic and environmental perspective.

LIFE12 ENV/ES/000124
LIFE BOHEALTH



Beneficiary:

Type of beneficiary

NGO-Foundation

Name of beneficiary

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Name of contact person

Jordi CAÑELLAS

Duration of project:

36 months (01/07/2013 – 01/07/2016)

Total budget in euro:

1,017,355.00

EC contribution in euro with %:

488,942.00 (48.06 %)

Themes: Environmental management: Life Cycle Assessment-Management / Services and Trade: Healthcare - Social work

Expected results

- A list of Best Available Technologies for reducing the environmental impact of the healthcare sector – and Key Performance Indicators for monitoring performance;
- A web-tool application to facilitate the selection of the most appropriate interventions for each hospital or healthcare centre, taking into account its specific characteristics;
- The definition of “Sustainable Action Plans” for each participating health centre, based on a Life Cycle Thinking approach;
- The implementation of the action plans in health centres, allowing them to progressively work towards the achievement of the following targets:
 - Resource consumption reduced by 10%;
 - Waste reduced by 10%;
 - Water saving of 20%;
 - Energy saving of 10%;
 - Waste recycling increased by 30%;
 - CO₂ emissions reduced by 15%; and
 - Water emissions reduced by 10%..

Support Tourism And Reduction Strategy (+20): STARS (+20)

Project background

Based on Eurostat and World Trade Organisation (WTO) statistics, the tourism sector in the EU accounts for 9.7 million jobs (12% of the EU workforce) and more than 10% of the EU's total GDP. It supports around 1.8 million enterprises, most of which are SMEs and micro-enterprises.

The EU is the world's no.1 tourist destination, with more than 500 million international tourist arrivals every year (40% of the global figure). Moreover, sustained growth of over 5% per year is forecast by the WTO for the rest of the decade.

However, the tourism sector generates about 5% of the EU's total CO₂ emissions. Transport, accommodation and tourism activities are the largest contributing factors. Unplanned and unlimited development of tourism has a harmful impact on the environment.

Project objectives

The project aims to reduce the impact of the tourism sector on climate change. It aims to develop an innovative approach, which will act as a model for the rural tourism sector in Europe and support the European strategy for combating climate change. Specific objectives are to:

- Implement a model based on the example of the 'Way of St James' (Camino de Santiago), a 'Pan-European tourist resource' with a high transfer potential at international level;
- Demonstrate the potential for reducing GHG emissions by more than 20% in SMEs active in the European tourism sector by means of a pilot action carried out in five lodging houses located in five Spanish regions;
- Validate the model through the results obtained in the pilot actions and carry out an additional verification of transferability to another EU country (Austria); and
- Establish a permanent network and secure commitments to carry out concrete measures to combat climate change using the example of the Way of St James.

Expected results

- A 20% reduction in energy consumption and GHG emissions in each of the five pilot areas;
- A reduction in CO₂ emissions of around 5000 tonnes and in water consumption of 10 000 m³, as a result

LIFE12 ENV/ES/000138
LIFE STARS (+20)



Beneficiary:

Type of beneficiary

NGO-Foundation

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Name of contact person

María Nieves ZUBALEZ MARCO

Duration of project:

36 months (01/10/2013 – 30/09/2016)

Total budget in euro:

1,705,699.00

EC contribution in euro with %:

819,658.00 (50.00%)

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Services and Trade: Tourism – Accommodation

of measures aimed to encourage walkers (or pilgrims) to limit their consumption of water to 1 m³ and production of CO₂ to 0.5 tonnes (10 000 commitments would result in savings of 5000 tonnes of CO₂ emissions and 10 000 m³ of water);

- Participation of more than 10 000 pilgrims from more than 10 EU countries in the pilot actions;
- Five 'info-points' in five Spanish regions that inform visitors about the project objectives and actions; and
- A platform comprising more than 100 tourism-related entities and SMEs committed to reducing their GHG emissions by 20% by 2020. Such commitments will be reinforced by the introduction of an Eco-label (Regulation EC66/2010).

Identification, monitoring and sustainable management of communal forests in Extremadura

Project background

Communal forests in Extremadura consist mainly of meadow lands covering 1 012 600 hectares. These communal forests constitute one of the most exceptional landscapes in the south-west of the Iberian Peninsula, with great historical, ecological and cultural value. They are one of the few agrosilvopastoral systems in Europe with a communal exploitation of natural resources by local forest users.

However, the forests are suffering from a progressive deterioration, mainly due to abandonment and a decline in common usage. It is important to identify and understand the characteristics of communal forests in order to determine the problems that threaten their persistence and common use.

Project objectives

The LIFE Comforest project aims to analyse and monitor the main features and the environmental status of communal forests in Extremadura, in order to improve understanding of their current state and to facilitate their future conservation. The project expects to establish guidelines that will make the traditional and communal exploitation of forests by local users compatible with their long-term conservation.

The specific objectives of the project are to:

- Collect and analyse information about the legal status, historical origin, and communal exploitation systems of each of the communal forests in Extremadura;
- Conduct forest inventories using light detection and ranging (LiDAR) technology – an innovative methodology in Extremadura – on sample plots;
- Monitor, via surveys, the wildlife, botany and forest health conditions – pests and diseases, global warming effects on the forest decay of oak stands, and the lack of natural regeneration;
- Create a public register of communal forests to give more legal security to common land exploitation rights and ensure the public-domain nature of these forests; and
- Establish guidelines for the conservation and regeneration of each type of communal forest – linking traditional and communal forest exploitation by local forest users and the long-term conservation of forest resources.

LIFE12 ENV/ES/000148
LIFE Comforest



Beneficiary:

Type of beneficiary

Regional authority

Name of beneficiary

Gobierno de Extremadura - Consejería de Agricultura, Desarrollo Rural, Medio Ambiente y Energía

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Name of contact person

Joaquín POLANCO NOAIN

Duration of project:

48 months (01/01/2014 – 31/12/2017)

Total budget in euro:

1,072,918.00

EC contribution in euro with %:

532,394.00 (50.00%)

Theme: Land-use and Planning: Forest management

Expected results

- A public register of communal forests;
- Silviculture reports – one for each communal forest – that analyse and summarise the results of the inventories and monitoring, including forest features, environmental status and land use;
- Sustainable forest management guidelines;
- Recovery of the public domain nature of forests where local forest users previously had communal land use rights; and
- Conservation and regeneration of communal forests.

Adaptation to climate change by the structural ceramics industry through the use of recycled glass as pastry

Project background

The ceramics industry converts clay into hard pottery and ceramics through firing. Through a process of vitrification, clay is hardened, tightened and partially glassified at high temperatures. In the production of earthenware, temperatures as high as 1250°C are required. However, clays vitrify at different temperatures depending upon their composition. For example, the use of recycled glass in the clay mix will reduce the firing temperature. Recycled glass of any kind and colour can be used.

A large amount of waste glass is generated in Europe each year, from various sectors of activity. Much progress has been made in recent decades in the collection and processing of glass for recycling. However, recycling options for glass from certain uses – including cathode ray tubes, vehicle windscreens and glass mixed with municipal solid waste – is still limited.

Project objectives

The LIFE CLAYGLASS project aims to reduce the environmental impact of the ceramics sector by demonstrating the technical and economic feasibility of producing ceramic tiles using any type of recycled glass as a flux material. In doing so, the project hopes to reduce CO₂ emissions from the firing process and provide a commercial use for waste glass streams that are otherwise difficult to recycle.

Specifically, the project will:

- Analyse and characterise types of glass and clay;
- Introduce a glass collection and transportation system – with storage and logistics arrangements adapted to the demand of the ceramics industries;
- Define optimal treatment of glass and clay as raw materials in the manufacture of stoneware products;
- Establish a pilot installation for glass treatment – milling – for the ceramics industry.

The addition of the recycled glass to the mix will reduce the demand for new raw materials from natural resources. It will also reduce the required firing temperature from around 1250°C to around 1110°C, which will provide associated reductions in energy consumption and CO₂ emissions.

The project expects to show that glass from difficult to recycle streams – such as end-of-use vehicles and WEEE glass – can be used as this flux material. This will turn

LIFE12 ENV/ES/000156
LIFE CLAYGLASS



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Name of contact person

Jorge VELASCO VÉLEZ

Duration of project:

36 months (01/09/2013 – 01/09/2016)

Total budget in euro:

1,977,222.00

EC contribution in euro with %:

988,611.00 (50.00%)

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Industry – Production: Non-metallic minerals

this glass waste into a resource with a new commercial application. Economic benefits will arise from this use of a waste stream, as well as the reduced demand for raw materials and reduced energy consumption.

Expected results

Demonstration of a new stoneware production using recycled glass, leading to:

- The commercial use of difficult-to-recycle glass that is currently land-filled;
- Reduced demand for natural resources in clay tile production;
- Energy savings of 10-15%;
- A reduction of about 2 000 t of CO₂ emissions per year for a medium-size factory (brick production capacity of 300 t per day); and
- A reduction in the cost of producing clay tiles.

Best practices effectiveness, prevention and protection measures for control of risk posed by engineered nanomaterials

Project background

The development of nanomaterials - defined as having at least one dimension of 100 nanometres or less - is a particularly exciting area of science and industry, which is expected to yield numerous technological advances. However, the unique properties of engineered nanomaterials (ENMs) also create potential health risks. Nanoparticles are released into the environment both intentionally and unintentionally throughout the life-cycle of their production, use and disposal.

The EU REACH Regulation requires manufacturers and importers to demonstrate that they have appropriately identified and assessed all the associated risks of any chemical substance manufactured or imported in quantities of one tonne or more per year per company. However, there is currently a lack of information or even standardised risk assessment methods for nanomaterials.

Project objectives

The project aims to minimise environmental, health and safety (EHS) risks from exposure to engineered nanomaterials (ENMs). It hopes to do this by improving understanding of the risks associated with the release of ENMs to the environment by the polymer nanocomposite industry and identifying the most appropriate prevention and protection measures.

It will collate new information on the release rates of ENMs to air, water, wastewater and oil during their production, use and disposal. This will contribute to a complete description of the exposure scenarios throughout the nanocomposites' life cycle. It will also study the airborne behaviour of the target ENMs, notably their aggregation/agglomeration patterns and deposition factors.

To identify the most appropriate Risk Management Measures (RMM) for controlling exposure to ENMs, the project will test potential RMMs at pilot scale. It will develop a compendium of testing protocols - based on international standards - and develop a nanoaerosols test chamber. RMMs tested in the chamber will include personal protective equipment (PPE), engineering techniques and organisational measures. The results will provide valuable data for determining whether a particular RMM is suitable, effective and feasible for a specific exposure scenario.

LIFE12 ENV/ES/000178
LIFE nanoRISK



Beneficiary:

Type of beneficiary

Research institution

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Name of contact person

Carmen SÁNCHEZ REIG

Duration of project:

36 months (01/10/2013 - 30/09/2016)

Total budget in euro:

1,165,790.00

EC contribution in euro with %:

582,893.00 (49.99 %)

Theme: Risk management: Human health protection - Industrial risks - Hazardous substances

The project's findings will help to strengthen the Library of RMM developed within the REACH Implementation Projects and improve the quality of Chemical Safety Assessments for nanomaterials.

Expected results

- A complete description of ENM exposure scenarios across the nanocomposites' life cycle;
- New information on the airborne behaviour of ENMs;
- A compendium of at least 10 testing protocols based on international standards to evaluate the effectiveness of RMMs in the workplace;
- A prototype nanoaerosols test chamber to assess RMM performance at pilot scale;
- A library of proven and technically feasible RMMs for mitigation and control of risks posed by ENMs;
- Improved Chemical Safety Assessments of nanomaterials, facilitating better implementation of the REACH Regulation; and
- A complete assessment report of ISO standards for PPE testing.

Improving water management efficiency at industries with organic load

Project background

Water-use projections suggest that increases in agricultural, industrial and household water consumption will mean that demand for clean water in the EU will outstrip supply by 40% by 2030. Water consumption by the industrial sector is broadly proportional to the average income level, representing over 40% in high-income countries in Western and Central Europe. A key challenge, therefore, is to maintain and even develop levels of industrial production, whilst also improving water management.

Project objectives

The project aims to develop, validate and disseminate a sustainable system for the re-use of process water from industries with high organic loads, such as the chemicals sector. It seeks to overcome existing challenges to the implementation of recommended Best Available Techniques (BATs), resulting in important reductions in water and energy consumption and associated costs.

The project hopes to develop a definitive solution based on the use of electrochemical oxidation and membrane filtration. Energy will be supplied by solar panels and an intelligent system will help to lower energy demand at peak times. The project also hopes to harness the hydrogen by-product of the treatment process as an energy source.

The target is 100% removal of total suspended solids without the use of flocculants, coagulants, polyelectrolytes or organic nutrients used in standard treatments. The chemical oxygen demand (COD) of the water will be reduced, therefore avoiding CO₂ emissions from standard wastewater treatment plants (WWTPs) and the production of any polluted sludge. The cleaned water will be sent for re-use in processes such as reactions, vacuum production, cleaning and cooling.

The project will test and optimise the process on wastewater from both chemical and food companies involved in the manufacture of products such as flavourings, fragrances, juices, frozen foods and pickled foods. It will also carry out technical, economic and adaptation studies to support the transfer of the process to other industries producing wastewater with high organic content, including the beverage, dairy and organic chemical industries.

LIFE12 ENV/ES/000184
LIFE WaterReuse



Beneficiary:

Type of beneficiary

International enterprise

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Pedro MUÑOZ

Duration of project:

24 months (01/10/2013 – 30/09/2015)

Total budget in euro:

1,688,437.00

EC contribution in euro with %:

844,218.00 (50.00%)

Theme: Environmental management: Cleaner technologies / Water: Waste water treatment

Expected results

The expected results include:

- Definition of a treatment solution for industrial wastewaters with high organic content, based on combined electrochemical oxidation and membrane filtration, with no chemical use, and achieving 100% removal of total suspended solids;
- Re-use of 95% of treated wastewater streams from chemical and food companies;
- A 13% reduction in water withdrawal by these companies;
- A reduction of 25.5 tonnes (t) of COD per year in wastewater – avoiding the production of 16 tonnes of CO₂ per year from aerobic respiration in traditional WWTPs;
- Energy consumption savings of 34% in comparison with standard WWTPs - equating to a reduction of 208 405 kWh per kilo of raw material processed and 61 t of CO₂ emissions (39%) per year;
- An additional energy production of 37 258 kWh from hydrogen by-product; and
- A cessation in the production of sludge, eliminating about 150 t per year.

Reducing CO₂ footprint of Information and Communication Technologies

Project background

The EU has set three strategic goals around climate change and energy to be achieved by 2020: a 20% reduction in greenhouse gas emissions; 20% of energy from renewable sources; and a 20% increase in energy efficiency.

The total footprint of the Information and Communication Technologies (ICT) sector was estimated in 2007 to be 830 million tonnes CO₂ equivalent - accounting for some 2% of the total emissions from human activity that year. ICT's share of greenhouse gas (GHG) emissions is expected to increase to as much as 6% by 2020. This, however, is expected to be more than offset by the 'enabling effect' of ICT on the carbon efficiency of other sectors such as transport, buildings, power and industry: any increases in GHG emissions from ICT are forecast to be five times less than the emissions saved by ICT elsewhere.

Project objectives

The project aims to harness the potential of ICT systems and devices to reduce GHG emissions. It seeks to model and promote better and smarter use of ICT to address the sector's own carbon footprint and to promote the enabling effect by which ICT implementation can reduce the carbon footprint of other sectors.

It will focus on administrative procedures, the education sector and urban management as demonstration fields to identify, test and validate best practice in the use of established and emerging ICT for GHG-emission reduction. It expects to both demonstrate and quantify the significant CO₂ emissions-reduction potential of better and smarter ICT use.

The project will test and audit implementation of ICT devices and applications to certify their environmental added value. These techniques are likely to include:

- Virtualisation of servers and data storage - by which one physical server is replaced by multiple virtual machines to reduce occupation of space and energy consumption;
- Implementation of ICT in green procurement actions;
- Implementation of ICT in the management of public services, such as public lighting or environmental monitoring;
- Sensors and mobility devices in smart cities; and
- Zero paper solutions.

Finally, the project will define and disseminate – nationally and internationally – standards in the use of ICT as a tool for reducing the environmental impact of different

LIFE12 ENV/ES/000222
LIFE GREEN TIC



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NGO-Foundation

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Duration of project:

36 months (02/09/2013 – 31/08/2016)

Total budget in euro:

1,454,240.00

EC contribution in euro with %:

659.120.00 (49.96%)

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Industry-Production: Electric - Electronics – Optical

activities. The objective is for these standards to ensure the highest performance levels by serving as benchmarks for public administrations and educational institutions.

Expected results

The project expects to achieve the following results:

- Validation of green ICT models for public administration facilities and educational institutions;
- In one test environment, moving from a system of seven servers and two storage facilities to just two servers and one disk box – virtualisation;
- A 50% reduction in energy consumption in comparison with conventional ICT facilities;
- A quantified reduction in the carbon footprint of the ICT sector;
- A quantified reduction in GHG emissions from other sectors through the enabling effect of ICT; and
- A reduction in GHG emissions of more than 100 tonnes/yr.

Zero waste in ceramic tile manufacture

Project background

The manufacturing of ceramic tiles generates an estimated three million tonnes of waste per year in Europe. Waste emerges from different stages of the production process, including from the forming, firing, glazing, grinding and polishing activities, as well as from broken or sub-standard products that have to be discarded.

The manufacturing process changes the composition of the materials – clay, glazes etc. - meaning a significant percentage cannot be re-used in manufacturing. Using ceramic waste material as low-value fillers in the construction industry is one of the few options available. As a result, large amounts of waste go to landfill.

Project objectives

The LIFE CERAM project's main objective is to demonstrate the feasibility of achieving zero-waste from the ceramic tile manufacturing process.

The project seeks to develop a new type of ceramic tile for outdoor use, e.g. urban paving, making use of a high ceramic waste in the body and glaze. The wastes from other energy-intensive processes – such as power plants and glass manufacturing – will also be tested.

The project will quantify and characterise all the wastes currently generated in the manufacture of ceramic tiles and related activities – including body composition suppliers, glaze producers and polishing facilities. It will do the same for wastes coming from other energy-intensive processes within a 100 km radius of the ceramics cluster in Castellón.

The researchers will design body and glaze compositions for the new product, which will allow for the use of all types of ceramic waste. The new glazes will be obtained by mixing different residues, ceramic and non ceramic, including up to 20% recycled glass. They will also design a highly sustainable process for manufacturing the new tiles, using existing dry milling and granulation technologies. They aim to move from laboratory-scale tests to successfully demonstrate industrial-scale feasibility.

Expected results

- Zero waste in the manufacture of ceramic tiles;
- Total recycling of the following approximate waste values generated by a ceramic tile company:
 - Green scraps: 3 500 t/year

LIFE12 ENV/ES/000230
LIFE CERAM



Beneficiary:

Type of beneficiary

Research institution

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Javier GARCÍA TEN

Duration of project:

34 months (01/09/2013 – 30/06/2016)

Total budget in euro:

799,502.00

EC contribution in euro with %:

398,324.00 (50.00%)

Theme: Industry-Production: Non-metallic minerals / Waste: Industrial waste

- Fired scraps: 1 000 t/year
- Glaze sludge: 1 500 t/year
- Polishing sludge: 350 t/year
- Dust from the kiln filters: 3.5 t/year
- Total recycling of the following approximate waste values generated by a glazing company:
 - Frit residues: 450 t/year
 - Glaze sludge: 350 t/year
 - Dust: 50 t/year
- Recycling of the following approximate waste values from other industrial processes:
 - Fly ash: 350 t/year
 - Recycled glass: 600 t/year
- A reduction in primary raw materials consumption;
- Reductions in water consumption (65 %), energy input (60 %) and CO₂ emissions (55 %), with associated cost savings.

Regenerative agricultural practices: demonstration of an alternative sustainable management of agrarian soils

Project background

Soil performs vital ecological, social and economic services for society. Its importance for the production of food, fibre and wood has been long recognised, as has its role as a surface for housing and infrastructure development. However, it is now recognised that soil also filters and buffers contaminants, allowing us to have clean drinking water, it acts as a pool of biodiversity, and it acts as a sink for atmospheric carbon dioxide. It even provides an archive of cultural heritage.

However, soil is subjected to some serious threats, making it a priority environmental issue at European level - as recognised by the EU Soil Protection Strategy. The main threats come from: inadequate farming and forestry practices; urban and industrial development; tourism; climate change; and major hydro-geological events such as flooding and landslides.

Project objectives

The LIFE REGEN FARMING project's main objective is to demonstrate successful regenerative agricultural practices for preventing soil degradation and improving soil quality. The project will test potential good practices in pasture management under different climatic and agricultural conditions.

It will also test regenerative practices for soil conservation, including the use of crops with minimum tillage, perennial crops, organic fertilisers, direct seeding and rotational grazing. These practices will be tested in-situ, on agricultural sites.

The project team will develop easy-to-use, fast and cheap diagnostic and monitoring methodologies to evaluate soil health, such as Agro-ecosystem Health Cards (TSAs) and chromatograms. Monitoring will then assess the environmental and socio-economic impact of the regenerative practices on farms.

By identifying the best practices in land use and management, the project hopes to promote real improvements in soil quality and biodiversity conservation. To support this, it will also provide quality training to farmers and technicians in the field of regenerative practices and sustainable agriculture. It thus expects to make an important contribution to the achievement of the goals of the EU's Soil Thematic Strategy and the EU 2020 Biodiversity Strategy.

LIFE12 ENV/ES/000232
LIFE REGEN FARMING



Beneficiary:

Type of beneficiary

Research institution

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Yolanda FERNÁNDEZ

Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

1,338,821.00

EC contribution in euro with %:

669,110.00 (50.00 %)

Theme: Industry-Production: Agriculture - Fisheries

Expected results

Successful demonstration of the environmental and socio-economic benefits of soil regeneration practices in different grazing areas, with the following targets:

- An increase of at least 5% in perennial grass species and grass diversity;
- A 10% improvement in biomass production;
- A 10% improvement in soil fertility – as measured by its capacity to hold water, nitrogen, potassium, phosphorous and molybdenum;
- A 10% increase in carbon fixation in the grass;
- A reduction in the use of fertilisers;
- A reduction in the cost of grazing animals for food and emissions per kg, accompanied by an improvement in meat quality; and
- A 10% improvement in the economic viability of livestock farming.

Promotion of best available techniques in the European footwear and tanning sectors

Project background

In recent years, growing awareness of the unsustainable use of natural resources, together with a greater environmental awareness generally, has led many companies to initiate efforts to improve their environmental performance and develop more sustainable production processes.

The tanning and footwear production sectors play an important role in the economies of many European countries, especially in the Mediterranean region. However, there is still a limited knowledge and understanding of alternative methods that reduce the environmental impact of production processes in these industries. The implementation of more environmentally friendly processes has been slow in both sectors.

Project objectives

The LIFE SHOEBAT project aims to increase knowledge and application of the most environmentally friendly techniques within the footwear and tanning industries. It will work with relevant companies in three Mediterranean countries: Spain, Italy and Portugal.

Specifically, SHOEBAT aims to create an interactive tool, which brings together the most environmentally friendly methods applicable to the tanning and footwear sectors. It will then work to raise awareness among companies in these sectors of the environmental impact of tanning and footwear activities and of the existence of new and improved techniques. The project will work to spread awareness and use of the interactive tool of good practices, and will demonstrate some of the best techniques in order to show companies what can be achieved through their implementation.

Expected results

- The creation of an interactive tool that incorporates the most environmentally friendly techniques from two industrial sectors - tanning and footwear;
- The use of this tool among European tanneries and footwear manufacturers;
- Increased interest in environmentally friendly techniques in the footwear and leather industries; and
- Environmental improvements in footwear companies and tanneries.

LIFE12 ENV/ES/000243
LIFE SHOEBAT



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Research institution

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Duration of project:

36 months (01/10/2013 – 30/09/2016)

Total budget in euro:

752,777.00

EC contribution in euro with %:

376,388.00 (50.00%)

Theme: Industry-Production: Leather and Footwear

Ecological treatment of acid drainage

Project background

Social and economic development in the south-west of the Iberian Peninsula - mainly Huelva, Spain - has been strongly associated with intensive mining in the Iberian Pyrite Belt (IPB). This belt of land - approximately 250 km long and 30-50 km wide - is a notable source of volcanic and sediment-hosted deposits of sulphide. Its original reserves were estimated at 1700 Mt (Sáez et al., 1999).

However, at present, mining has ceased and the only legacy for the population of the region is the existence of more than 100 abandoned mines and over 2x10⁸ m³ of waste, which is scattered across the area in the form of mine tailings, tailing dams, open pits, etc. These remnants of the area's mining past have a very severe impact on the landscape and present a significant environmental risk, especially from the leaching of minerals into the natural environment.

Project objectives

The LIFE-ETAD project aims to remediate waters contaminated by mining activities through passive treatment that relies on natural water flow and biogeochemical reactions. It hopes to demonstrate a pilot full-scale application of passive treatment technology to clean acid waters from mining leachate to the standards required for irrigation water.

The project will use dispersed alkaline substrate (DAS) as the passive treatment. This consists of an inert, coarse, high-surface matrix, such as wood chips, mixed with a fine-grained alkaline material, such as limestone sand. Passing the water through this treatment will remove metals such as iron, zinc, nickel, cadmium, cobalt and aluminium. Only natural energy sources will be needed to power the system - gravity, microbial metabolic energy and photosynthesis.

The project expects to show the technical and economic feasibility of this process as a means of cleaning water contaminated with acid leachate from mines. The project thus hopes to contribute to the faster achievement of the objectives of the National Hydrological Plan for the Tinto, Odiel and Piedras Rivers and the EU Water Framework Directive. It also hopes to enable the development of vineyards and citrus plantations as alternative economic activities in the affected areas.

LIFE12 ENV/ES/000250
LIFE-ETAD



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International enterprise

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Antonio RAMIREZ

Duration of project:

54 months (01/07/2013 - 31/12/2017)

Total budget in euro:

2,650,738.00

EC contribution in euro with %:

1,325,173.00 (49.99%)

Theme: Industry-Production: Mining - Quarrying / Risk management: Site rehabilitation - Decontamination / Waste: Industrial waste / Water: Waste water treatment

Through the validation of this water treatment process at these highly polluted sites in southern Spain, the project also expects to demonstrate its potential use in other locations and possibly the renewed economic feasibility of mining activities to meet growing demand for minerals from countries such as China.

Expected results

An economically and technically feasible passive system of treating contaminated wastewater from mining sites, demonstrated at full-scale, and achieving:

- 90-100% removal of acidity and metals from the contaminated water;
- pH values of the treated water within the range 6.0-8.0;
- Contaminants reduced to close to the detection limit; and
- Water clean enough for irrigation, with the potential for further output solutions to provide water that can be used for human consumption.

Demonstration of natural coagulant use advantages in physical and chemical treatments in industry and urban waste water

Project background

The industrial sectors of ceramics and textiles consume large quantities of water, generating significant amounts of contaminated wastewater. This wastewater has to be treated before being returned to the natural environment in order to avoid pollution of surface waters.

The most important treatments in the primary phase are coagulation and flocculation. These use large amounts of chemical products to remove suspended particles and produce sludge as a by-product. Standard sludge from urban wastewater treatment can typically be dehydrated and treated for use as fertiliser. However, the sludge from ceramic and textile industrial wastewater treatment can be dangerous because of the metals or toxicity derived from the pH.

Treatment solutions for contaminated sludge also tend to use chemical products derived from non-renewable resources. However, there is potential to use organic products from natural sources to tackle both the metal and pH challenges of the ceramic and textile wastewater sludge, reducing its dangerous character.

Project objectives

The LIFE ADNATUR project aims to demonstrate an innovative and environmentally friendly primary treatment of wastewater. The ultimate aim is to avoid the production of sludge waste contaminated with hazardous chemicals from the treatment of urban and industrial wastewaters.

The project will develop a new innovative technology, based on natural products, for the primary treatment of wastewaters at urban and industrial level. It aims to improve the coagulant efficiency in wastewater treatment procedures when compared with current alternatives such as synthetic or inorganic materials. This in turn aims to reduce the dosage of coagulant needed and avoid the need for chemical neutralising agents, such as hydrogen chloride (HCl) and nitric acid (HNO₃).

To assess its performance, the team will design and assemble two prototype industrial-scale wastewater-treatment plants. Two Spanish companies from the textile and ceramic sector will test the treatment technique using the first prototype. The second prototype will be used to test the technique for the treatment of urban wastewater. These tests aim to assess, fine-tune and

LIFE12 ENV/ES/000265
LIFE ADNATUR



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Duration of project:

36 months (01/10/2013 – 30/09/2016)

Total budget in euro:

1,560,754.00

EC contribution in euro with %:

745,502.00 (47.77 %)

Themes: Industry-Production: Textiles – Clothing /
Water: Waste water treatment

ultimately validate the new treatment technique in real-life industrial and urban settings.

The implementation of the new technology at EU level is expected to provide economic, technical and environmental advantages. These will arise from reductions in chemical consumption, energy and resource savings and the avoidance of contaminating wastewater and sludge.

Expected results

The project expects to achieve the following results:

- A reduction of up to 75% in the use of chemicals – notably neutralising agents such as HCl and HNO₃;
- A 35% reduction in consumption of coagulant products;
- A reduction of organic products in the flocculant dosage of some 10%;
- Avoidance of metallic elements including iron and aluminium in waste sludge; and
- A 40% reduction in costs..

Monitoring and modelling NO_x removal efficiency of photocatalytic materials: A STRategy for urban air quality managEmEnT

Project background

Road traffic is the main source of nitrogen oxides (NO_x) pollutants. In the Madrid urban area and the Henares corridor, NO₂ limits are frequently surpassed in the October to February period. In order to reduce this pollution, different strategies have been implemented and tested. One emerging solution is the use of building materials incorporating photo-catalytic substances, such as titanium dioxide (TiO₂), which, when activated by solar radiation, eliminate these pollutants by means of photo-catalytic reactions. This research has led to the commercialisation of several building materials.

Project objectives

The project is set within the framework of the 'Thematic Strategy on Air Pollution' (COM(2005)446). It aims to evaluate air pollution abatement strategies for traffic-related NO_x levels, in particular NO₂, in cities. MINOX-STREET will offer local authorities guidelines for applying sustainable, cost-effective and integrated solutions for air quality management, such as optimising the use of commercial photo-catalytic materials designed for air purification, and assessing the role that these materials can play in combination with others technologies and strategies (cost/benefit analyses).

To achieve this aim, the project will develop and set up a prototype (microscale CFD model, coupled to the urban atmospheric chemistry and NO_x deposition velocities) that is able to calculate the level of pollutants in urban environments.

Specific objectives are to:

- Test and compare the potential usefulness of a range of commercial photo-catalytic materials to act as NO₂ (NO_x) sinks, and select the most promising solutions to be used on urban surfaces and in real conditions;
- Provide data from rigorous assays and tests on the physical-chemical properties and expected efficiency of several commercial photo-catalytic materials, both in controlled and real-life conditions;
- Obtain the parameterisations of NO₂ and NO_x deposition velocity on selected photo-catalytic surfaces;
- Use photo-catalytic materials in real urban settings and demonstrate their air-purifying capabilities;
- Assess the potential impact of the use of these products arising from the generation of sub-products (nitrates in lixiviates, deposited and re-suspended particle matter containing the photoactive catalyst TiO₂, and volatile organic compounds);

LIFE12 ENV/ES/000280
LIFE MINOX-STREET



Beneficiary:

Type of beneficiary

Public enterprise

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Duration of project:

60 months (01/07/2013 – 01/07/2018)

Total budget in euro:

1,982,619.00

EC contribution in euro with %:

916,913.00 (50.00 %)

Theme: Air and Noise: Air quality monitoring

- Evaluate the air-purifying impact from use of combined photo-catalytic materials in different urban environments at district level, using the prototype; and
- Estimate the cost/benefits of this and other NO₂ (NO_x) urban air abatement strategies.

Expected results

The project findings will form the basis of a guide for local authorities on the feasibility and protocols for the use of photo-catalytic materials with NO₂ (NO_x) depolluting properties in urban environments, within the framework of an integrated NO₂ (NO_x) abatement strategies evaluation. This technology has the potential to reduce NO_x concentration in cities by up to 40%.

Demonstration of cyclodextrin techniques in treatment of waste water in textile industry to recover and reuse textile dyes

Project background

Textile industries commonly create wastewater containing potentially hazardous contaminants for the environment. Dye compounds are one of the wastewater contaminants that often need special treatment. The percentages of unfixed dyes remaining in wastewater can range from approximately 1% in pigments to as much as 50% for reactives. The reactive dye used on cotton is that which displays the lowest fixation ratio. Given that cotton represents half the textile output on the world's markets, the problem of effluent coloured with reactive dyes greatly increases the contamination problem.

Standards laid down in water legislation state that the admitted levels of dye are such that the colour will be inappreciable in a dilution of 1/40. Currently, several treatments are performed, some separated, others combined to meet the standard: either by mixing and blending with wastewater from other processes that do not use dyes to reduce the overall value obtained; or through a chemical treatment of the dye to destroy the colour group, which involves additional chemicals.

Project objectives

The LIFE DYES4EVER project aims to demonstrate and validate the ability of cyclodextrins (CDs – a compound made of sugar molecules obtained from starch) as encapsulation agents for dyes. The advantage of encapsulating the dye with CDs over current techniques of purification is that apart from reducing residual water coloration, the process allows for recovery of the dye compounds in a reusable form that can be applied in subsequent dyeing process. In addition, it is possible to reuse the water in the new process as it is not polluted with dyes.

A semi-industrial scale pilot will be set up to recover CDs and dyes in wastewater. This process is relatively complex for two reasons: firstly, the variety of dyes used to obtain the range of colours demanded by the fashion industry; and secondly, the differing specific requirements of dyes depending upon the textile substrate used.

The prototype will be installed in a typical Spanish textile company in order to provide representative results.

LIFE12 ENV/ES/000309
LIFE DYES4EVER



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Duration of project:

30 months (01/07/2013 – 31/12/2015)

Total budget in euro:

919.740.00

EC contribution in euro with %:

459.244.00 (50.00 %)

Themes: Industry-Production: Textiles – Clothing /
Waste: Waste reduction – Raw material saving

Expected results

The project expects to achieve the following results:

- A considerable reduction in the use of chemicals (dye-stuffs), which will in turn mean that these are not released into the environment;
- A 70-80% reduction in the purifying costs of dye removal of wastewater;
- The ability to use up to 95% of recovered CDs in subsequent dyeing processes;
- The recovery, in one single treatment, of at least 90% of the unfixed dye that remains in the effluent. Greater accuracy is not possible because this value will also depend on the type of dye and fibre used in the process as well as any auxiliary products and processes involved. In addition to the quantity of dye recovered, the project expects to achieve the legislated dilution of 1/40 without the need for any further purification; and
- The project will also reduce CO₂ emissions from the savings in dyes manufacturing and transport.

Footwear Carbon Footprint

Project background

More and more industrial and economic sectors are monitoring the amount of greenhouse gas (GHG) emissions they are releasing into the atmosphere – notably carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆). Totals for each of these gases are converted into CO₂ equivalent values to enable the total emissions to be expressed in one figure - the carbon footprint.

However, calculating the carbon footprint is a challenge for many industrial sectors, which often have many components and many phases during the manufacturing cycle, and during the life-cycle of the product. The production of footwear is based on the assembly of diverse components, including leather, soles and textiles. An accurate calculation of the carbon footprint of footwear manufacturing must, therefore, consider the GHG emitted from the manufacture of the material components, as well as the assembly phases.

Project objectives

The main objective of the LIFE CO₂SHOE project is to develop a carbon footprint calculation tool for the footwear sector. This tool will make it possible to measure the GHG emissions produced by each pair of shoes, in an objective way, which can be shared by all footwear manufacturers. The ultimate aim is not to compare the carbon footprint of companies but to facilitate decision-making and monitoring to reduce GHG emissions in the sector.

The project will develop the carbon footprint calculation tool and initially use it with footwear manufacturing companies in Spain, Italy, Portugal and Poland. It will apply the calculation tool to 36 different footwear styles produced by 12 participating companies. The tool is expected to enable companies to identify the processes and phases generating the most GHG emissions and the low-carbon alternatives that can be applied. It should, therefore, highlight where GHG emission reductions can most easily be achieved.

Through its application and testing during the project, the tool is expected to promote the concept and practice of eco-design in the footwear industry and deliver carbon footprint reductions of at least 10% in the participating companies. The project hopes to demonstrate the value of the tool for long-term application beyond the partici-

LIFE12 ENV/ES/000315
LIFE CO₂SHOE



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Professional organisation

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Duration of project:

48 months (01/10/2013 – 30/09/2017)

Total budget in euro:

750,468.00

EC contribution in euro with %:

368,984.00 (50.00%)

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Industry – Production: Leather and Footwear

pating companies in contributing to the achievement of European commitments under the UNFCCC Kyoto Protocol, the EU's Climate and Energy Package and national emission reduction targets.

Expected results

- Development of a carbon footprint calculation tool for the footwear sector, capable of quantifying GHG emissions, expressed as CO₂ equivalents, per pair of shoes;
- Application of the calculation tool to 36 footwear styles, produced by the 12 participating companies from four EU Member States;
- Incorporation of eco-design into production models to improve environmental performance;
- Reduction of GHG emissions by 10% in the footwear styles produced by the participating companies; and
- Potential to commercialise the tool and spread it to footwear companies in other EU countries after the project.

Development of an interactive tool for the implementation of environmental legislation in Nanoparticle manufacturers

Project background

The development of nanomaterials - defined as having at least one dimension of 100 nanometres or less - is an area of science and industry expected to yield numerous technological advances. However, the unique properties of engineered nanomaterials (ENMs) also create potential health risks. Nano-particles are released into the environment both intentionally and unintentionally throughout the ENM lifecycle (production, use and disposal). This is believed to create risks of bioaccumulation in soil and water or excessive absorption through the skin, with consequent negative effects on environmental and human health. There is already increasing evidence of ecotoxicological effects on key species and communities, including the inhibition of seed germination and root growth, and oxidative stress in algae.

Project objectives

The objective of the project is to contribute to the efficient implementation of environmental policy and legislation by companies involved in the production of nanomaterials, especially SMEs. It aims to help these companies access the most up-to-date information on the potential environmental impact of their activity and the current legislative requirements.

The project will establish a complete and thorough compilation of current environmental regulations related to nanomaterials at European and national levels, in each country participating in the project - Spain, Portugal, Romania and Finland. It will also develop methodologies and tests to assess the environmental impact of nanomaterials and their production processes.

To ensure nanomaterial producers can access the information they need, the project intends to develop an interactive platform. This will provide the latest information on the environmental impact of nanomaterials, related legislation and appropriate environmental management. It will also provide an environmental self-diagnosis e-tool for nanotechnology companies. The project hopes to extend the e-Tool throughout the EU.

Ultimately, the project aims to enable companies manufacturing nanomaterials to successfully implement the most appropriate management techniques and meet the requirements of European and national environmental legislation. As well as reducing the environmental risks associated with nanotechnology, the project also seeks

LIFE12 ENV/ES/000326
i-NANOTOOL LIFE+



Beneficiary:

Type of beneficiary

Research institution

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Natividad ALCÓN

Duration of project:

30 months (01/07/2013 - 31/12/2015)

Total budget in euro:

1,101,236.00

EC contribution in euro with %:

540,616.00 (50.00%)

Theme: Risk management: Human health protection
- Industrial risks - Hazardous substances - Risk assessment and monitoring

to contribute to the updating of environmental policy and legislation around nanotechnology.

Expected results

The project's expected results include:

- A compilation of current European environmental regulations related to nanomaterials;
- A compilation of current national environmental regulations in each country participating in the project - Spain, Portugal, Romania and Finland;
- Tests and methodologies to assess the environmental impact of nanomaterials and their production processes;
- An innovative e-tool for assessing the environmental status of nanomaterial manufacturers and identifying appropriate management measures; and
- Awareness of the project and its outputs by 50% of nanomaterial manufacturers in Europe.

Nutrient and Energy Recovery in Wastewater Treatment Plants by Up-concentration and Adsorption processes

Project background

To meet the requirements of European legislation, Wastewater treatment plants (WWTPs) must reduce the nutrient content of effluent discharges to within certain limits. Such limits exist, for example, for suspended solids (SS), chemical oxygen demand (COD), biochemical oxygen demand (BOD), nitrogen (N), and phosphorous (P). These nutrients could be recovered for use in products such as fertilisers. At the same time, WWTPs need to become more energy efficient. The treatment phase currently consumes a large amount of energy, which has a negative impact in terms of CO₂ emission and climate change. However, there is potential to recover energy from the treatment process in the form of biogas from anaerobic digestion. At present, energy recovery is not very efficient.

Project objectives

The project aims to demonstrate an efficient process for recovering energy and nutrients from the wastewater treatment process. Specifically, it aims to demonstrate, by means of a prototype, an innovative WWTP flowchart based on a cradle-to-cradle approach.

The new system will be based on an innovative up-concentration – biosorption – step at the inlet of the WWTP. This will produce an upper effluent with very little solids and a bottom effluent with a high quantity of solids. The downstream process focuses on handling the two streams from the up-concentration step to produce maximum energy and nutrient recovery. The anaerobic digestion of the up-concentrated sludge in a continuous stirred-tank reactor (CSTR) will produce biogas more efficiently than conventional anaerobic digestion.

The project will evaluate and confirm the benefits of this cradle-to-cradle approach, across the life cycle of the WWTP process. It specifically aims to confirm the:

- technical feasibility (proof of concept): proving that the flowchart is relevant and that the operation is reliable and efficient;
- efficient recovery of resources: proving that the energy balance of the plant is improved and nutrients can be recovered from the main stream;
- environmental benefits: quantifying the reduction in terms of environmental impacts using a Life Cycle Analysis approach;
- economic viability: proving that WWTP system costs are reduced using a Life Cycle Costing approach.

LIFE12 ENV/ES/000332
LIFE RECOVERY



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Alexandre GALÍ

Duration of project:

42 months (01/07/2013 – 31/12/2016)

Total budget in euro:

1,813,054.00

EC contribution in euro with %:

904,802.00 (50.00%)

Theme: Water-Waste water treatment

The project will define how the system can be applied in existing WWTPs and promote a change of mind-set in order to improve performance and implementation of the flow chart. It will work to identify the key stakeholders for future commercialisation.

Expected results

An innovative prototype for a self-sustainable WWTP concept, delivering both improved energy and resource efficiency. The system will:

- Be 60% energy self-sufficient, with greater biogas production arising from the higher sludge recovered in the up-concentration process;
- Achieve 70% nutrient recovery, by implementing recovery of N and P in the main line;
- Return 80% of by-products to land by re-using the sludge produced in anaerobic digestion; and
- Deliver a 30% reduction in the carbon footprint of the WWTP.

Implementation of a New Phosphate Removal Tertiary Treatment in WWTP

Project background

Eutrophication can occur when a body of water acquires a high concentration of nutrients – phosphates and nitrates – from agricultural, industrial and urban effluents. The nutrients can cause excessive growth of simple organisms such as algae, blocking out light from the water and leading to the depletion of available oxygen through the decomposition of dead organic matter. These changes in water quality can eradicate more complex species of plants and animals, reduce the aesthetic and recreational value of the water body and can even create risks to human health.

Systems to efficiently remove nitrogen have been successfully developed; however the elimination of phosphorus components still needs to improve. European legislation has set a target of 80% phosphates removal and more efficient processes are needed to achieve this target in an affordable way.

Project objectives

The LIFE-REMPHOS project aims to develop a more efficient and cost-effective technology for removing phosphates from wastewater that will be suitable for both industrial and urban wastewater treatment plants (WWTPs). Specifically it aims to effectively demonstrate valorisation of a by-product of magnesite production as a precipitating agent to remove phosphates from wastewater.

The project will develop a new precipitation agent for the removal of phosphates from wastewater made of 63% magnesium oxide, a by-product of magnesite production. It hopes to demonstrate valorisation of this by-product, for which no feasible use or economic value has been found previously.

It will test the new precipitation agent in a pilot plant consisting of a Continuous Stirred-Tank Reactor (CSTR) implemented as a tertiary treatment in the WWTP after the nitrate-removal phase. It hopes to demonstrate successful reductions in phosphate concentration in the wastewater by chemical precipitation.

The project seeks to demonstrate that the technology can achieve European legislative targets on the removal of phosphates from wastewater in a way that is more cost-effective than current chemical and biological treatment solutions. Economic and other environmental ben-

LIFE12 ENV/ES/000361
LIFE-REMPHOS



Beneficiary:

Type of beneficiary

Research institution

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Name of contact person

Claudio FERNÁNDEZ

Duration of project:

42 months (01/09/2013 – 28/02/2017)

Total budget in euro:

988,375.00

EC contribution in euro with %:

494,187.00 (50.00 %)

Theme: Water: Waste water treatment

efits will arise from the use of an industrial by-product instead of freshly mined raw materials. It also hopes to find potential management solutions for the precipitate resulting from the treatment process.

Expected results

The project expects to achieve the following results:

- Valorisation of a magnesite by-product as a precipitation agent;
- A pilot plant able to treat 480 m³/day of wastewater;
- Phosphate removal efficiency of 83-91%;
- Increased cost-effectiveness in comparison with current treatment solutions;
- Decreased risk of eutrophication from phosphate-laden effluents;
- A contribution to the achievement of the water quality targets of the Water Framework Directive;
- A demonstration of the applicability of the technology to either industrial or urban WWTPs; and
- Development of an effective way to manage the final precipitate from the treatment process.

Fixation of atmospheric CO₂ and reduction of greenhouse emissions by sustainable management of irrigation agriculture

Project background

Agriculture is responsible for 20% of total greenhouse gas emissions, without even considering associated energy consumption. These emissions originate mainly from the fermentation and oxidation of organic matter and nitrogenised compounds. However, levels can vary significantly depending on the agricultural techniques used.

The introduction of modern irrigation systems to enable agriculture in arid and semi-arid areas can bring significant economic benefits. In the region of Navarra alone, 22 300 ha have already been transformed into irrigated land and a further 30 000 ha are planned. This is despite the Ebro Valley having some of the poorest soils in Spain as regards carbon matter. However, these land-use changes - and, for example, associated introduction of fertilisers - can impact on GHG emissions and environmental services, such as carbon sequestration.

Project objectives

LIFE RegaDIOX aims to design, test, demonstrate and disseminate an improved model for sustainable management of irrigated agricultural areas. This aims to deliver positive effects on climate change through increased CO₂ sequestration and reduction of GHG emissions.

The project will undertake six demonstration pilot experiences with different agricultural practices in Navarra. These will test and quantify their efficiency in increasing the organic matter content of soil and delivering a more efficient and sustainable use of nutrients, energy and water. This research thus aims to identify the best land-management practices for increasing soil carbon fixation and reducing GHG emissions.

It will produce a methodological guide with all the good practices developed and educate and train farmers in their implementation and agricultural sustainability more generally. Ultimately, the project hopes to contribute to a more positive impact on climate change from irrigated agricultural activities. The project hopes to use its results to inform related agricultural/environmental policymaking at regional, national and European levels.

Expected results

The project expects to achieve the following results:

- Improved knowledge on GHG emissions and carbon capture associated with irrigated agriculture systems;

LIFE12 ENV/ES/000426

LIFE RegaDIOX



Beneficiary:

Type of beneficiary

NGO-Foundation

Name of beneficiary

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Name of contact person

Legardi CAMPOS

Duration of project:

42 months (01/07/2013 – 31/12/2016)

Total budget in euro:

937,666.00

EC contribution in euro with %:

468,332.00 (50.00%)

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Industry-Production: Agriculture - Fisheries

- Demonstration of techniques for delivering positive effects on climate change from irrigated agriculture systems, with quantified increases in capacity for CO₂ capture and quantified decreases in related GHG emissions;
- Specification of an improved model of sustainable management of irrigated agriculture with a methodological guide to the best practices identified;
- Training and capacity-building of at least 30 professional farmers on the use of this new management model and techniques; and
- Recommendations for ways of including the lessons of the project in agricultural/environmental policies at regional, national and/or European level.

Integral Management Model for Phosphorus recovery and reuse from Urban Wastewater

Project background

Around 80% of phosphates production is for use as fertilisers, with agriculture still highly dependent on these products to sustain high yields. This leads to accumulation of large amounts of phosphorous in soils and landfills, and contamination of water from effluents and leaching. Furthermore, the phosphates are manufactured from phosphate-containing rock mined from deposits. This phosphate rock is a non-renewable material and is essential for life. The increasing scarcity of phosphate rocks is a significant environmental problem.

Project objectives

The LIFE PHORWater project aims to develop an innovative and cost-effective solution for phosphates recovery in wastewater treatment plants (WWTPs). Furthermore, it hopes to show that the phosphates can be recovered in a form that can be valorised as fertiliser. It thus hopes to improve the performance of WWTPs, reduce excess phosphorous in the natural environment and limit the demand for mining of phosphate rock.

The project will develop a demonstration plant to recover phosphorus from wastewater. This will take the form of a real-scale facility at pre-industrial level coupled to a WWTP. The facility will use a process of precipitation to extract phosphorous in a crystallised form - magnesium ammonium phosphate, known as struvite. The project will work to optimise this integrated process for maximised recovery of phosphorous from WWTPs.

Additional economic and environmental advantages are foreseen for the operation of the WWTP. Successful extraction of over 80% of the phosphorous components should reduce the overall quantity of sludge waste produced by the WWTP. Furthermore, the oxygen demand – energy – to reduce levels of ammonia will also be reduced. Overall operating costs for the WWTP are expected to decrease by some 15%.

The project aims to show that the struvite obtained from the treatment process is potentially marketable to the fertiliser industry. It will test it in agricultural situations, expecting to show that it has properties that provide significant economic and environmental advantages over other phosphate-based fertilisers. For example, its slow-release nature should reduce the risk of burning plant roots through over-exposure and its insoluble nature in neutral water should restrict leaching into groundwater and avoid risks of eutrophication in surrounding waterways.

LIFE12 ENV/ES/000441
LIFE PHORWater



Beneficiary:

Type of beneficiary

Public enterprise

Name of beneficiary

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Name of contact person

Laura PASTOR

Duration of project:

36 months (01/09/2013 – 31/08/2016)

Total budget in euro:

1,275,064.00

EC contribution in euro with %:

637,532.00 (50.00 %)

Theme: Water: Waste water treatment

Expected results

The project expects to achieve the following results:

- An optimised Phosphorus Management Protocol in WWTPs;
- A phosphorus recovery efficiency of over 80%;
- Recovery of some 30% of the phosphates in the form of struvite;
- Proven valorisation of struvite as a high-quality phosphate fertiliser with reduced risks of leaching and eutrophication;
- Reduction of phosphate-rock mining;
- A 10% reduction of sludge production in the WWTP;
- A 10% reduction in the energy needed to reduce ammonia in the WWTP;
- A 15% reduction in WWTP operating costs;
- A reduction in phosphorous non-point pollution from sludge waste; and
- Reduced eutrophication and associated greenhouse gas emissions.

Supercritical water co-oxidation (SCWcO) of urban sewage and wastes

Project background

Overall waste generation is stable in the EU. However, generation of sewage sludge is still increasing, partly as a result of the progressive implementation of the Urban Waste Water Treatment Directive (91/271/EEC).

By 2020, all waste should be managed as a resource and landfilling of organic material should be virtually eliminated. However, to achieve this for sewage sludge – and avoid landfilling or incineration – new technologies are necessary. These technologies need to take account of the fact that sludge tends to concentrate heavy metals and poorly biodegradable trace organic compounds, as well as potentially pathogenic organisms.

Project objectives

The Lo2x project aims to demonstrate the environmental and socio-economic benefits of using WWTPs as a means of resource recovery, not only from sludge but also from other waste streams with similar or worse effects on water quality. It specifically aims to demonstrate a synergic co-treatment of sewage sludge and other wastes - including raw/digested manure, high-load food processing wastes, pesticides and leachates – based on supercritical water oxidation technology, with energy and phosphorous recovery.

The project will design and construct a prototype for the oxidation in supercritical water of mixtures of sludge and other wastes. The mix should provide enhanced performance through synergies. The sludge will provide embedded energy from the organic content, manure should provide for phosphorous recovery and ammonia elimination, and food wastes should provide extra carbon. This should enable the complete destruction of organic toxic substances - pesticides and leachates.

The beneficiary will work to define optimum operating conditions and mix ratios for best process yield – including optimum recovery of phosphorous - and energy balance. It thus aims to reduce the final amount and environmental impact of waste generated by a WWTP. It also expects to show economic benefits from: reductions in the cost of sludge management – treatment and disposal; exploitation of recovered phosphorous; and improved energy balance.

The process thus expects to demonstrate feasible improvements that can contribute to the achievement of

LIFE12 ENV/ES/000477
LIFE Lo2x



Beneficiary:

Type of beneficiary

Professional organisation

Name of beneficiary

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Albert CANUT

Duration of project:

39 months (01/10/2013 – 31/12/2016)

Total budget in euro:

2,948,698.00

EC contribution in euro with %:

1,474,348.00 (50.00%)

Theme: Industry-Production: Agriculture – Fisheries / Water-Waste water treatment

European objectives related to: reducing landfill of organic wastes; energy efficiency; water quality; and the European Resource Efficiency Roadmap.

Expected results

The successful demonstration of a treatment process for mixed sludge and other wastes based on supercritical water oxidation technology, and achieving:

- 100% elimination of pesticides;
- 100% elimination of ammonia;
- Climate neutrality of wastewater systems / positive energy balance;
- 100% recovery of phosphorous;
- 90% reduction of sewage sludge leaving the WWTP;
- Complete mineralisation of the final waste (compared to around 55-60% volatile fraction in current dehydrated sludge that has undergone anaerobic digestion); and
- At least a 10% reduction in sludge treatment costs, including investment and running costs.

Demonstration and validation of innovative methodology for regional climate change adaptation in the Mediterranean area

Project background

Progress in the preparation of climate change adaptation strategies varies across the Mediterranean countries, where work is still needed to properly evaluate and validate the impact of strategy proposals. Methodological gaps remain in terms of preparing strategies and much of the current work on climate change adaptation is focused on specific sectors (water, forests, agriculture, health) or on spatial planning (local, regional, national). Better integration is needed to ensure improved coordination of multi-disciplinary approaches.

The Catalan Strategy for Climate Change Adaptation aims to address this challenge. It contains more than 100 different coordinated climate actions, but such measures need to be properly tested in order to confirm that the strategy will be effective when mainstreamed.

Project objectives

The project aims to test some of the proposed measures in the Catalan Strategy for Climate Change Adaptation. Pilot actions will be designed, implemented and monitored at different sites in order to help quantify the effects (positive and negative) of applying adaptation measures. These actions will target:

- Domestic and urban water use, where project work will investigate optimal water management processes - in terms of achieving water savings via ways that are efficient from an environmental, energy and social perspective;
- Agriculture, where the project will demonstrate the effectiveness of measures for reducing water stresses linked to agricultural consumption. This will include work with different crop varieties, irrigation systems and sustainable soil management techniques;
- Forests, where pilot actions will help to quantify the effects of forest management on the health of forests, water availability and the fire risk.

Moreover, the project will assess the climate and land use change impacts and vulnerabilities of selected watersheds, diagnose and evaluate the adaptation measures that have been already applied in those watersheds, and propose a strategy for adapting those watersheds to climate change through the development of an action plan. Project outcomes will be widely disseminated throughout the Mediterranean, and beyond.

LIFE12 ENV/ES/000536
LIFE MEDACC



Beneficiary:

Type of beneficiary

Regional authority

Name of beneficiary

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Name of contact person

Gabriel BORRÀS

Duration of project:

60 months (01/07/2013 – 30/06/2018)

Total budget in euro:

2,548,841.00

EC contribution in euro with %:

1,266,208.00 (49.78%)

Theme: Climate change – Energy: Adaptation to climate change

Expected results

The main anticipated result of the LIFE MEDACC project is the validation, at pilot scale, of an innovative strategy for climate change adaptation, and the improvement of adaptation capacity to climate change in Mediterranean watersheds, with a special focus on three sectors in Catalonia.

Key milestones that will help to achieve this overall result include: validation of a methodology, based on indicators, to evaluate the effectiveness of adaptation measures; completing assessments of future climate change impacts and vulnerabilities using two climate change and two land cover scenarios; preparing three action plans with a description, prioritisation and budget for adaptation measures; and establishing six demonstration sites (one experimental plot on adaptation measures for agriculture and one for forests in each watershed).

Water Cycle Efficiency Improvement by Boosting Industrial Water Reuse

Project background

Water scarcity is among the main problems to be faced by society in the 21st century. Water conservation is one of the key solutions to the scarcity problem and there is increasing recognition of the potential of water reclamation and re-use as a sustainable practice within a framework of integrated water management. Water re-use brings two main benefits: firstly, the provision of an alternative water resource; and secondly, the reduction of environmental impacts from wastewater disposal.

Project objectives

LIFE WIRE aims to demonstrate the technical and economic viability of efficiently treating reclaimed urban wastewater for reuse in major industrial sectors. It specifically hopes to demonstrate successful combination of leading-edge technologies, including ultra-filtration (UF), carbon nano-structured material (CNM) and reverse osmosis (RO) to achieve the desired water quality efficiently.

The project plans to test which combinations and configurations of these technologies are the most technically and economically viable to treat reclaimed urban wastewater for industrial use. It will notably evaluate CNM as a pre-treatment for RO and the synergic interaction between UF and CNM in terms of improvement of hydraulic performance and treatment efficiency.

It will implement the tests at the Wastewater Reclamation Plant (WWRP) of El Prat, optimising the different elements within each tested configuration. It will also consider the most appropriate operational and cleaning strategies to minimise the consumption of energy and chemicals, increase the life-span of component parts – notably filters and CNM media – and minimise the production of by-product waste.

The beneficiary will work with three partner companies from the major industrial sectors of the Barcelona area: chemicals; liquid waste disposal; and electro-coating. The aim is to create a system that is flexible enough to produce recycled water of different qualities for different industrial uses. They will also explore any adaptations that may be required in the industries to use the reclaimed water.

The project will conduct technical and economic assessments of the process and subsequent water reuse. It thus aims to demonstrate its numerous financial and

LIFE12 ENV/ES/000545
LIFE WIRE



Beneficiary:

Type of beneficiary

Research institution

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Ignacio MARTÍN

Duration of project:

36 months (01/10/2013 – 30/09/2016)

Total budget in euro:

1,724,617.00

EC contribution in euro with %:

862,306.00 (50.00%)

Theme: Water: Waste water treatment

environmental advantages, compared to conventional water treatment and industrial water consumption. Finally, it will foster such water re-use initiatives through knowledge transfer to industrial end-users and WWTPs.

Expected results

The project's expected results will include:

- Demonstration of leading-edge technologies to treat urban wastewater for reuse in different industrial sectors;
- Definition of optimised processes for different water quality grades;
- Successful reuse of the reclaimed water in several industrial applications;
- Total water consumption savings of up to 100% for metal coating; up to 90% for marine fuel waste and industrial residues treatment; and up to 80% for chemicals, dyes and pigments; and
- Quantification of all the economic and environmental benefits arising.

Sustainable solutions for very small water supplies

Project background

The provision of water services in scattered rural communities is a challenge of great significance for the implementation of European regulations concerning the quality of water intended for human consumption (Directive 98/83/EC) and the protection and management of water (Directive 2000/60/EC).

Currently, in Galicia, 650 000 people consume water through uncontrolled autonomous solutions such as wells and water sanitation systems. Unfortunately, in most cases, these independent solutions do not comply with the required legal environmental, health and water quality standards.

Project objectives

The LIFE RURAL SUPPLIES project's main objective is to strengthen the sustainability of water supplies in scattered rural communities that lack clean water. It will demonstrate that it is possible to provide small communities with a quality supply from groundwater through the correct implementation of uptake systems, the introduction of effective sanitation and the adoption of management and control programmes.

The project will build supply systems at individual and community levels as well as autonomous sanitation systems. Specifically, it will construct four pilot sustainable water supply facilities: a sustainable private well for a rural house; a community water supply system; a rainwater reclamation facility; and a community water sanitation system.

The project has four main sub-objectives:

- Determine the most appropriate technical solutions in the uptake, distribution and subsequent treatment of groundwater consumed from wells and springs;
- Test autonomous facilities in rural housing to reduce the environmental impact of domestic wastewater;
- Validate Water Safety Plans (WSPs), a tool to improve the security of supply recommended by the World Health Organisation; and
- Define a feasible model of recovering cost for autonomous water services in rural areas, encouraging the efficient use of water resources.

The project will publish a guide for implementation of autonomous water supplies in small communities in coherence with environmental and public health require-

LIFE12 ENV/ES/000557
LIFE RURAL SUPPLIES



Beneficiary:

Type of beneficiary

Local authority

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Carlos AMEIJENDA MOSQUERA

Duration of project:

48 months (01/07/2013 – 30/06/2017)

Total budget in euro:

774,122.00

EC contribution in euro with %:

382,560.00 (50.00%)

Theme: Water: Water management and supply

ments. This will include technical instructions, the cost recovery model and definitions of the necessary conditions for the authorisation of new water sources. The beneficiary thus hopes to promote potential transfer of the model to the other 24 000 small towns and villages in Galicia.

Expected results

The project expects to achieve the following results:

- Construction of pilot individual supply, community supply and autonomous sanitation systems;
- Technical instructions for the implementation of a management model of non-centralised water supplies and sanitation systems;
- A feasible model of cost recovery for autonomous rural water services;
- Definition of the necessary conditions for accessing new water sources; and
- A guide for the development of control programs to implement the model across Galicia.

Creation, management and promotion of green infrastructure in Zaragoza

Project background

Zaragoza is one of the largest municipalities in Spain, both in terms of surface area – around 1 000 km² - and population - around 700 000 inhabitants. It is crossed by three rivers in the central area of the Ebro basin, an arid area with a distinctive natural heritage, both in terms of nature and geology. Several type of landscapes coexist with human activity, which results in a rich biodiversity, made up of 1 312 species of flora and 402 species of fauna.

In all, about 40% of the land area of the municipality is significant in terms of biodiversity. However, these conservation areas suffer from isolation and fragmentation due to urban encroachment, degradation of river basins, deforestation, inadequate legal protection, and lack of awareness among the local population.

Project objectives

The project aims to protect, improve, give value to and raise awareness of the existing biodiversity in Zaragoza, including in Natura 2000 areas, and other areas of natural interest within the city's boundaries. A key objective of the project is to improve the quality of green infrastructure (GI). This is a network of high quality green spaces and other environmental features that deliver a wide range of environmental and quality of life benefits for local communities.

The project plans to design and manage Zaragoza's GI by structuring it around a 'blue matrix' of infrastructure, including rivers, riversides and wetlands, and a 'green matrix', focusing on forest and steppe areas. It aims to improve the ecological status of these two aspects of GI as well as their inter-connectivity and coherence to provide a multifunctional resource.

It will conduct eight technical studies and draft plans for the management of Zaragoza's GI. It will then partially or fully restore eight nature areas – about 5 ha - including the planting of more than 1 000 trees. It will also undertake legal and administrative actions focused on providing GI with legal recognition and protection, and promote further land stewardship activities, including signposting.

Supporting activities will include: promoting local heritage sites; actions to promote green employment; promoting local nature tourism; and awareness-raising activities targeting local inhabitants. It also aims to create a European network of cities with GI to continue developing EU expertise on this topic beyond the project.

LIFE12 ENV/ES/000567
LIFE ZARAGOZA NATURAL



Beneficiary:

Type of beneficiary

Local authority

Name of beneficiary

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Name of contact person

Javier CELMA

Duration of project:

40 months (02/09/2013 – 30/12/2016)

Total budget in euro:

2,183,636.00

EC contribution in euro with %:

815,875.00 (50.00 %)

Themes: Biodiversity issues: Ecological coherence / Information-Communication: Awareness raising – Information / Land-use and Planning: Sensitive and protected areas management

Expected results

- Protection of GI and steppe areas under urban planning and law;
- Eight technical studies, documents and plans to support GI;
- Eight nature areas partially or fully restored - about 5 ha, with more than 1 000 new trees planted;
- About 56 km of pathways and corridors improved and signposted;
- Increased local awareness of the environmental value of nature areas. This will include targeting about 2 000 students;
- Increased awareness of Zaragoza as a destination for nature tourism; and
- A European network of cities with GI, with at least 10 stable partners.

Recovery of tannery wastes for functional micro-encapsulated products

Project background

The tanning industry treats animal skins to produce durable leather products. It generates large volumes of by-products and waste materials, which can cause significant negative environmental impacts. The advancement of European policy and legislation protecting the environment has encouraged the exploration of ways to transform tannery waste materials into valuable products.

Collagen and gelatine are important components of solid tannery wastes. The gel-forming properties of gelatine are the basis for classical applications in the food, photographic, cosmetic and pharmaceutical industries. However, potential new applications have also arisen, including for use as a micro-encapsulating agent. Micro-encapsulation involves covering tiny particles or droplets with a coating to provide useful new properties. It is showing potential for highly innovative technologies such as scratch-n-sniff, time-release pharmaceuticals and self-healing materials.

Project objectives

The main objective of the LIFE MICROTAN project is to demonstrate, on a semi-industrial scale, the technical, environmental and financial feasibility of the isolation of protein products - collagen and gelatine - with specific properties from tannery solid wastes. It hopes thus to enable their valorisation as natural micro-encapsulating agents in the production of active materials with functional properties.

The project aims to design, construct and operate a demonstration plant for the treatment of solid tannery wastes from SMEs located in the countries participating in the project. It will develop a procedure for the optimum recovery of collagen and gelatine with the required properties for use in micro-encapsulation. It hopes to recover as much untanned waste as possible, with the non-collagenic fraction sent for composting.

LIFE MICROTAN aims to demonstrate the production of microcapsules from the collagen and gelatine obtained in the demonstration plant and thus show the feasibility of the valorisation of this industrial by-product. It will conduct environmental and economic assessments of the potential of new products made from these former waste materials.

LIFE12 ENV/ES/000568
LIFE MICROTAN



Beneficiary:

Type of beneficiary

Professional organisation

Name of beneficiary

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Name of contact person

Francisca ARÁN AÍÑ

Duration of project:

36 months (01/11/2013 – 31/10/2016)

Total budget in euro:

793,816.00

EC contribution in euro with %:

396,908.00 (50.00 %)

Themes: Industry-Production: Leather and Footwear / Waste: Industrial waste

Expected results

The project expects to achieve the following results:

- Identification of the best conditions for extracting collagen and gelatine from solid tannery wastes;
- Construction of a demonstration plant able to treat at least 50 kg/day of tanneries waste;
- Obtention of collagen and gelatine with the specific properties for use as shell-forming biopolymer or microcapsules;
- Valorisation of 15% of untanned solid waste generated by tanneries;
- Economic benefits from reduced waste transportation and valorisation of the collagen and gelatine by-products in new niche markets; and
- Environmental benefits from a reduced volume of waste from tanneries and a 10% reduction in waste transportation.

Integral use of oil seed to reduce greenhouse gases emissions associated with farming

Project background

The use of fossil fuels accounts for 8% per cent of greenhouse gas (GHG) emissions from agricultural production. However, vegetable oil is an interesting bio-fuel alternative for use in agrarian systems, since it can be produced on the farm. Oil can be extracted mechanically with a ram press that uses a piston inside a cage to crush the oilseed and force out the oil into a tank. The use of rapeseed oil has been shown by studies to reduce GHG emissions by up to 57% compared to diesel fuel.

Project objectives

The LIFE SEED CAPITAL project aims to present and demonstrate ways of saving energy and reducing emissions of greenhouse gases in agrarian systems based on 100% exploitation of oilseed. It firstly aims to extract rapeseed oil as a sustainable replacement for diesel fuel in agricultural machinery. It secondly targets the use of the residual cake for improved animal feed with a higher fat content, resulting in lower methane emissions from the ruminants.

The first part of the project will demonstrate the potential of vegetable oils blended with diesel as a fuel for farm machinery. It will show how to mechanically extract and purify the oil from oilseed rape on the farm. It will assess the quality of the oil obtained and define the parameters for mixing it with diesel to create a more sustainable fuel blend. Its use will then be tested on the farm, with revisions after every 5 000 km for vehicles and after every 600 working hours for machines to ensure the maintenance of performance.

The by-product of the oil extraction process is a solid residue rich in fat. The second part of the project aims to demonstrate the use of this oilseed cake in the formulation of ruminant feeds that reduce enteric methane production in the animals. The project will formulate at least 50 experimental recipes for ruminant feed containing cold-pressed rapeseed cake.

The project will monitor the GHG reductions resulting from the implementation of 100% exploitation of oilseed. It will define a scheme for evaluating CO₂ emissions and characterise the carbon and energy balance of the monitored fields over a minimum of 50 ha. The project hopes overall to demonstrate a contribution to EU 2020 targets on the reduction of greenhouse gas emissions and use of renewables.

LIFE12 ENV/ES/000590
LIFE SEED CAPITAL



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Yolanda FERNÁNDEZ

Duration of project:

37 months (02/09/2013 – 30/09/2016)

Total budget in euro:

1,024,766.00

EC contribution in euro with %:

512,382.00 (50.00 %)

Themes: Climate change – Energy: Energy supply – Reduction of greenhouse gases emissions / Industry – Production: Agriculture – Fisheries

Expected results

The project expects to achieve the following results:

- Demonstration of the 100% valorisation of oilseed;
- Definition of the optimum mix of vegetable and diesel oils for use as fuel in agricultural machinery – and control parameters for the fuel's use, including conservation time and compatibility with polymers and metals used in tanks;
- Demonstration that the consumption of biofuels can be increased about 20-40% without major problems in farm machinery;
- Reduction of GHG emissions and improved carbon and energy balance from biofuel use;
- Reduction of enteric methane production by about 10-20% from use of oilseed cake in ruminant feed; and
- Demonstration of the economic feasibility of this alternative agrarian system for farmers.

New environmentally friendly forming technique of ceramic sanitary wares by isostatic pressing

Project background

Current methods of manufacturing ceramic bathroom fixtures and fittings consume large amounts of energy and water. For instance, the beneficiary's factory consumes over 130 000 m³/yr of water, which is used in processes such as washing moulds.

The bathrooms industry also produces a large amount of wastewater and other liquid and solid residues, both organic and inorganic. Once these are filtered out of the water, only a small proportion can be reused and the rest are sent to landfill.

Project objectives

The LIFE ENVIP project aims to demonstrate an innovative application of a relatively new technology for reducing resource consumption in the manufacture of ceramic bathroom products. It thus hopes to contribute to a reduction of the environmental impact of the ceramic bathroom-ware sector.

The project plans to construct a pre-industrial-scale prototype facility for forming ceramic bathroom products by isostatic pressing of atomised paste using fluid pressure – from a liquid or gas - to modify materials. It will validate different ceramic paste compositions for the isostatic pressing process and identify the optimal conditions for the industrial forming process of bathroom products of different shapes and sizes, meeting required quality levels and technical specifications.

The project expects to demonstrate that, compared to traditional processes of pressure slip casting, the isostatic pressing forming technology can reduce the amount of water needed to wash moulds. The volume of wastewater – and subsequent use of coagulants and flocculants in wastewater treatment - will likewise be significantly reduced, as will the amount of solid waste emerging from the moulds.

Energy consumption will also be avoided, together with corresponding greenhouse gas emissions. The principal energy savings will come from avoiding the need to heat water to 45°C for mould cleaning and from avoiding much of the need to dry products and moulds. Process productivity increases should also reduce energy consumption.

LIFE12 ENV/ES/000598
LIFE ENVIP



Beneficiary:

Type of beneficiary

Large enterprise

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Antonio ALBURQUERQUE

Duration of project:

30 months (01/07/2013 – 31/12/2015)

Total budget in euro:

1,791,078.00

EC contribution in euro with %:

895,539.00 (50.00 %)

Theme: Environmental management: Cleaner technologies / Industry-Production: Non-metallic minerals

Expected results

The project expects to achieve the following results:

- Demonstration of the efficiency, sustainability and technical performance of a forming process of bathroom-wares based on isostatic pressing;
- Reduction of the process cycle time to 20-60 seconds per product;
- Elimination of 280 litres of water consumption for washing the moulds of each product - considering an average annual production of a ROCA factory of 465 108 products, a total reduction of some 130 230 m³/year is expected;
- Reduction in the volume of wastewater generated and discharged, with a consequent reduction in the use of coagulants and flocculants;
- A 440 tonne/month reduction in the volume of solid waste generated;
- A 13.74 kWh per product reduction in energy consumption; and
- A reduction in CO₂ emissions of some 2.78 kg per product.

Improving Water Reuse at the coastal areas by an advanced desalination process

Project background

Water scarcity in Europe remains a problem, due to, among other things, population growth, urbanisation, and climate change. The Water Framework Directive (WFD) promotes measures for water reuse from treated wastewater as one option for helping avoid over exploitation of aquifers. In coastal and island areas this can be especially pertinent, as groundwater sources in these areas can also suffer from contamination by salt water.

As an alternative water resource, treated wastewater can be reused for agricultural and landscape irrigation, industrial recycling and reuse, groundwater recharge, non-potable urban uses and indirect potable use. Using treated wastewater for these purposes reduces pressure on aquifers, especially those located in coastal areas.

New technological solutions, such as Forward Osmosis (FO) offer opportunities to improve the effectiveness of wastewater treatment systems and processes.

Project objectives

The main objective of the LIFE-OFREA project is to increase the amount of wastewater available for reuse in areas where the salinity of fresh water is a limiting factor. This will be achieved by demonstrating the feasibility of Forward Osmosis technology in the production of safe and high quality water from treated wastewater for reuse, at a reasonable cost. The project will also seek to ensure that the amount of energy consumed during the treatment process is 20% lower than equivalent effluent treatment processes using reverse osmosis.

The project also aims to show that FO treatment processes require 15% fewer chemicals for disinfection, pre-treatment and membrane treatment than reverse osmosis treatment processes.

The project will thus seek to demonstrate a fully automated, robust and environmentally safe wastewater treatment process using FO technology. The results will be used to promote FO as a viable option for WFD stakeholders.

Expected results

The main expected results of the LIFE-OFREA project include:

- Producing high quality water with less than 1 mS/cm of electrical conductivity, which fulfils all the quality indicators of the Regulation for water reuse;

LIFE12 ENV/ES/000632
LIFE-OFREA



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Jordi BACARDIT

Duration of project:

36 months (01/10/2013 – 30/09/2016)

Total budget in euro:

797,976.00

EC contribution in euro with %:

398,988.00 (50.00 %)

Theme: Water: Water quality improvement

- 20% less energy used and 15% less chemicals needed to produce water of the same quality as that from reverse osmosis treatments; and
- A fully operational demonstration plant, which produces safe water for reuse (agricultural, urban or industrial uses) at a reasonable price. The plant will be equipped with properly tested controls and automation tools to further highlight the relevance and potential of FO as a cost effective technology for tackling Europe's water stress.

Slag layers in railway foundations

Project background

Steelmaking can be carried out by basic oxygen steelmaking – primary steelmaking – in which oxygen is blown through molten pig iron. Another process is the Electric Arc Furnace (EAF) – secondary steelmaking – in which scrap metal and/or pig iron is directly exposed to an electric arc and melted down.

A by-product of both processes is steel furnace slag (SFS) which forms on the surface of the molten steel. Currently, a great volume of slag is dumped, although there is increasing research into different application alternatives. One of the most important is as a recycled aggregate in road construction, as material for road foundation layers.

Project objectives

The LIFE GAIN project aims to demonstrate the feasibility of using SFS as an eco-friendly aggregate in the construction of railway tracks – specifically to form sub-ballast and sub-grade track foundation layers, a completely new technological solution. The ultimate goal of the project is to reduce the large volume of SFS that is annually disposed in landfills.

The project will produce a new eco-friendly aggregate – SFS-Rail – in valorisation plants. It plans to locate these plants next to steel furnaces to minimise the frequency and intensity of transport. A key feature will be the demonstration that it is possible to adapt an existing valorisation plant to produce the new material.

The project plans to construct 100 m-long test sections of rail. It will then use these to monitor the eco-friendly aggregate's performance and hopefully demonstrate the predicted benefits of the material. Beyond showing that it is a technically feasible application for recycled SFS, existing research suggests that the project can hope to prove that its mechanical properties – strength, hardness etc. – will actually make it a more durable and sustainable product than natural aggregates.

LIFE GAIN hopes to show that SFS-Rail is an innovative, sustainable and eco-friendly alternative to natural aggregates, applicable throughout Europe. It expects to demonstrate that the technology used to produce SFS-Rail will be easily transferrable to other European countries where there are a large number of furnaces currently facing the same environmental problem.

LIFE12 ENV/ES/000638
LIFE GAIN



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

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Joan PESET

Duration of project:

39 months (01/07/2013 – 30/09/2016)

Total budget in euro:

1,301,526.00

EC contribution in euro with %:

650,763.00 (50.00 %)

Themes: Industry-Production: Metal industry / Waste:
Waste reduction – Raw material saving

Expected results

Based on the application of SFS-Rail in the test sections of the project:

- Reduction of the volume of the annual slag disposal on landfills by 1 078 tonnes – with a potential reduction in Europe of 360 000 tonnes/yr;
- Reduction of the use of natural aggregates by 1 078 tonnes – also with a potential reduction of 360 000 tonnes/yr;
- Reduction of the environmental impact at quarries;
- Reduction of the frequency and intensity of transport of SFS;
- Reduction of energy consumption by 197.5 MkwH - with a potential reduction in Europe of 65 909 MkwH/yr;
- A reduction in overall CO₂ emissions of 6.03 tonnes – with a potential reduction of 2 014 tonnes/yr; and
- Reduction of other environmental impacts, including deforestation, the impact on vegetation and fauna and hydrological impact.

Farms for the future: Innovation for sustainable manure management from farm to soil

Project background

Pork industries are important to many local economies in Spain. However, pig farming generates slurry waste containing high levels of nutrients, such as nitrogen. Inappropriate management of this waste stream can lead to pollution of surface water, ground water and air, especially in areas of high production. This can cause significant damage to local ecosystems through processes such as eutrophication of waterways.

At the same time, there is increasing understanding of the important ecological services provided by certain forms of land use. For example, areas of forest and peatland act as important carbon sinks. Planting trees and other crops can also be important for extracting nutrients from the soil, preventing soil erosion and protecting and increasing biodiversity.

Project objectives

The project aims to minimise the extent of nutrient excess in soils caused by the pig farming sector by acting in three main places: in pig farms; in field application of manure; and in soils affected by agricultural nutrient excess. It aims to show that successful solutions can improve soil quality, whilst also delivering important additional environmental benefits.

Specific sub-objectives include:

- Minimising the quantity of nutrients from manure exiting pig farms in the wastewater. It will apply techniques for optimising water use and improving waste treatment;
- Improving the efficiency of manure application in the field through the introduction of Best Available Technologies (BATs). The project will implement decision-making tools for initial fertilisation stages and advanced tele-detection techniques to determine manure application; and
- It will work to extract agricultural nutrient excess that is already present in soils, using catch crops, forest plantations and riparian buffers, which should naturally manage nutrient levels.

The project thus hopes to reduce nutrient excess in the soils and restore soil quality and functions. Plant growth should contribute to an improved natural environment and some CO₂ extraction as well as providing a source of biofuel as a renewable energy source.

LIFE12 ENV/ES/000647
LIFE+Farms for the future



Beneficiary:

Type of beneficiary

Regional authority

Name of beneficiary

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Jaume BOIXADERA

Duration of project:

48 months (10/09/2013 – 09/09/2017)

Total budget in euro:

2,367,610.00

EC contribution in euro with %:

1,177,877.00 (50.00 %)

Theme: Industry-Production-Agriculture - Fisheries,Waste-Agricultural waste

The project hopes to demonstrate the transferability of the proposed manure treatment and application technologies by showing that they are environmentally friendly and economically efficient. The project thus expects to contribute to the successful implementation of the EU soil strategy.

Expected results

Demonstration of best practice for managing pig farm waste to avoid excess nutrients in soil, delivering at least:

- A 20% saving in water and nutrient output of pig farms;
- A 25% reduction in the area of manure application;
- A 10% reduction in management costs for manure application;
- Successful growth of areas of catch crops, forest and riparian buffers; and
- A 20% increase in biogas production.

In-situ treatment technology for drinking water production from nitrate-polluted groundwater

Project background

The quality of Europe's groundwater supplies has been threatened by an increase in the amount of nitrates entering aquifers. Agriculture has been linked to this increase in groundwater contamination, which can result in serious negative impacts, such as increased water stress and risks to human health. The latter can be particularly problematic in parts of rural Europe, where residents still rely on wells for their drinking water.

Project objectives

The project aims to demonstrate the potential of an innovative technology for tackling groundwater pollution from nitrates. The technology will be used to restore groundwater quality and improve the safety of drinking water in wells, especially for small communities that do not have access to other freshwater sources.

These objectives will be achieved through the following actions:

- Demonstrating at pilot scale, the feasibility of in-situ bioremediation technology for treating nitrate-polluted groundwater to a standard suitable for human consumption;
- Developing an innovative tool for design and prediction, based on mathematical modelling, to describe the performance of the in-situ bioremediation technology in any aquifer, and assist in the design of the optimal remediation strategy at each new site;
- Studying the feasibility of the in-situ technology from a technical, environmental and economic perspective, and comparing this technology with other existing technologies using the same indicators;
- Fostering uptake of the technology and involving stakeholders and target groups in the technology's development;
- Assessing the potential for transferring the technology to other European specific sites to demonstrate its potential implementation; and
- Preparing a decision matrix to select the best organic matter to be used in the in-situ bioremediation, based on technical, economic and environmental criteria.

Expected results

Among the main expected results are:

- A validated strategy and technology for in-situ treatment of nitrate-polluted groundwater and the production of drinking water for small communities;
- One pilot plant will be designed, operated and optimised;

LIFE12 ENV/ES/000651

LIFE+ InSiTrate



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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David SMITH

Duration of project:

48 months (01/07/2013 – 30/06/2017)

Total budget in euro:

1,211,634.00

EC contribution in euro with %:

590,841.00 (50.00%)

Theme: Water: Water management and supply

- Removal of at least 1 000 kg of nitrates from groundwater;
- Obtaining 20 000 m³ of water that meets drinking water standards;
- Design of a tool, based on mathematical modelling, to support the development of the project pilot plant, and two other plants at different sites to show its potential transferability;
- Selection criteria established for organic matter, taking account of technical, economic and environmental aspects, and including the evaluation of 15 organic substrates;
- Quantified comparison of the developed technology with two other existing ex-situ technologies and the water blending option. The comparison will include technical, economic and environmental aspects; and
- An environmental profile of the in-situ treatment for the main environmental impact categories.

New tool to improve risk assessment and promote the safe use of nanomaterials in the textile finishing industry

Project background

Europe's textile sector is an important employer, exporter and service provider. Maintaining these benefits requires that the sector evolves to compete in an increasingly sophisticated global market. Innovation can help Europe's textile sector to succeed, by focusing on higher value-added and sustainable products.

Nanomaterials offer opportunities to provide such value-added products and the growth in nanotechnologies continues to present new prospects for sectors such as textiles. However, more knowledge is still needed to clarify the overall environmental suitability (including the health implications) of these opportunities. Improved understanding about issues such as the potential toxicological impacts on people and nature will help to ensure that the adoption by Europe's textile industry of nanomaterials produces sustainable outcomes.

Project objectives

The LIFE_ECO-TEXNANO project aims to improve the competitiveness of the EU textile sector by demonstrating the suitability of nanomaterials for producing high value, low cost textiles. This will be achieved by improving the environmental performance of innovative textiles that incorporate nanoparticles. The focus will be on the textile finishing industry, where environmental and health and safety impacts from using nanomaterials during finishing will be assessed. The overall aim is to help confirm and demonstrate their potential as 'green' technologies.

Two pilot trials will provide evidence of best practice in the application of nano-based techniques and will compare these with conventional finishing chemicals. Comprehensive Life Cycle Assessments will be carried out on nanomaterials and the findings will inform the development and testing of robust risk assessment techniques that will be made available to EU textile companies.

Expected results

Results expected from ECO-TEXNANO include the following:

- The development of an innovative tool for improving knowledge on risk assessment of nanomaterials and promoting their safe use throughout their life cycle. This tool will allow environmental, health and safety impacts of future textile materials to be properly evaluated during their design stage;

LIFE12 ENV/ES/000667
LIFE_ECO-TEXNANO



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Dirk SASETA

Duration of project:

36 months (01/10/2013 – 30/09/2016)

Total budget in euro:

1,157,914.00

EC contribution in euro with %:

578,957.00 (50.00 %)

Themes: Industry-Production: Textiles – Clothing / Risk management: Human health protection - Industrial risks - Hazardous substances

- Emissions to air, soil and water will be reduced by 5% to 10%, depending on the specific measures implemented;
- The development of this tool will serve as a basis for the further development of a network to share data with stakeholders, including scientific committees, EU policy makers and international researchers, thereby helping to close knowledge gaps about nanomaterials;
- Enhanced knowledge on risk assessment of nanomaterials;
- Monitoring of risk characterisation ratios (RCR) in order to measure the improvements in the protection of the environment and human health from risks posed by nanomaterials; and
- Demonstration of two pilot scale trials using nanoparticles.

New demonstrative pilot plant for the purification of waste water with oils, fats and hydrocarbons

Project background

Oil, fats or hydrocarbons commonly comprise around 2% of wastewater content. These organic compounds can present a challenge for traditional wastewater treatment systems due to the toxicity of the sludge by-products that remain after treatments. In Spain, according to data from the national registry of sludges, around 1.2 million tonnes (dry matter) of this sludge is produced annually and 8% of it is dumped in landfills.

New solutions for treating oil, fats, and hydrocarbons in wastewater are needed in order to find ways of reusing the organic compounds and reducing pressure on landfill. Such solutions will make useful contributions to EC directives such as 2000/60/CE and 271/91/CEE.

Project objectives

The main objective of the LIFE-PURIWAT project is to design and development a pilot plant, with a treatment capacity of 5 000 dm³ per hour, which will be able to remove between 97% and 99% of hydrocarbons, oil and fats from wastewater, thereby satisfying the requirements of current European directives (91/271/EC and 2000/60/EG).

The project's pilot plant will use a filter with a specific elastomeric material and a biodegradation system comprising microorganisms that can degrade or remove contaminants. This will allow for the target organic materials to be either separated and reused for secondary purposes, or eliminated altogether. The project's technology will be tested on different types of wastewater to demonstrate its broad potential application.

Expected results

The LIFE-PURIWAT project aims to achieve the following results:

- Demonstration of a pilot plant, with a treatment capacity of 5000 dm³/ hour, capable of reducing the content of oil, fats and hydrocarbons in wastewater by between 97% and 99%;
- Development of a filter that does not absorb water and can retain organic contaminants of more than 100% in weight from wastewater;
- Reduce the discharge of these contaminants to less than 2%;
- Reuse of the purified water as high quality water for non-potable purposes;
- Develop a technology capable of being applied in different sectors and in different types of locations; and

LIFE12 ENV/ES/000684
LIFE-PURIWAT



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Duration of project:

42 months (01/09/2013 – 28/02/2017)

Total budget in euro:

1,238,408.00

EC contribution in euro with %:

499,175.00 (50.00 %)

Theme: Water: Waste water treatment

- Adaptability of the plant to different installations, which will allow for the treatment of wastewater from different sources.

Integrated management of three artificial wetlands in compliance with the Water Framework, Birds and Nitrates Directives

Project background

Albufera Lake is located some 12 km south of Valencia. It is a shallow freshwater lake with a surface of over 2 400 ha and separated from the Mediterranean Sea by a significant sand bank. The lake and surrounding wetlands are protected as a site of Community importance under the EU Habitats Directive.

The lake is also an important site for birds, particularly migratory species that use it as a resting and nesting site. Many rare bird species live in the area so the lake and its surrounding areas are also protected as a special protected area under the EU Birds Directive. However, despite the various levels and forms of protection, the lake water is of poor quality and fails to meet the quality objectives of the Water Framework Directive (WFD). Specifically, the lake is hypertrophic, meaning that there is an excess of nutrients in the water.

Project objectives

The LIFE ALBUFERA project aims to demonstrate effective management of artificial wetlands in a natural area to achieve a double objective: improving water quality; and improving the habitat of important bird species. It thus hopes to demonstrate a means of meeting the requirements of the European WFD and the objectives of the Birds and Habitats directives.

The project will define, implement and optimise management procedures for three artificial wetlands in the area of the Albufera lake, with the goal of enabling each hectare of artificial wetland to treat 5 000 m³ of lake water per month, removing excess nutrients. It will monitor the impact of these measures on water quality as the water passes through the wetland.

Linking the water quality improvement with biodiversity benefits, the project will set management objectives and criteria for restoring the ecological potential of the wetland in terms of bird and fish populations. Notably, it will define a methodology for determining good status indicators for bird conservation and conduct monitoring of the effects on the breeding birds that are most sensitive to water quality.

Finally, the project will conduct an assessment of the socio-economic impact of the management measures on the local economy and population. The project thus expects to deliver an overall understanding of the impact and benefits of artificial wetland management and

LIFE12 ENV/ES/000685
LIFE ALBUFERA



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Miguel MARTÍN MONERRIS

Duration of project:

36 months (01/10/2013 – 30/09/2016)

Total budget in euro:

1,446,234.00

EC contribution in euro with %:

723,117.00 (50.00%)

Theme: Land-use and Planning: Sensitive and protected areas management

promote the widespread use of this technique in the EU to achieve multiple environmental goals.

Expected results

The project expects to achieve the following results:

- Definition of the most adequate management rules for artificial wetlands;
- Treatment of 450 000 m³/month of water from the Albufera lake;
- An improvement of at least 30% in standard water quality variables – including content of suspended solids, phosphorous, nitrogen and chlorophyll;
- Improvement of the conservation status of habitats and biodiversity – including notable benefits to important migratory bird species;
- A contribution to the achievement of the goals of the WFD, Habitats Directive and Birds Directive; and
- A set of recommendations on the management of wetland Natura 2000 sites and delivery of River Basin Management Plans.

LCA, environmental footprints and intelligent analysis for the rail infrastructure construction sector

Project background

Transport infrastructure is essential for economic and social development, as well as being an important sector in its own right. Among the various transport infrastructure options, rail is considered as one of the most sustainable, especially with regard to the fight against climate change. Rail is therefore an essential element of European transport and environment policies.

However, more needs to be done to improve the environmental performance of the rail sector. Currently, it is estimated that 28% of the total emissions associated with rail transport come from infrastructure. Almost half of these emissions occur during the construction phase, mainly during the production and transportation of materials.

Project objectives

LIFE HUELLAS aims to reduce the carbon and water footprint of rail infrastructure by developing tools and methodologies to optimise decision-making during the construction process. It plans to provide railway construction companies with a tool that combines environmental, economic and social analysis to enable them to be, and to be seen to be, more sustainable.

It will work to identify the most appropriate methodologies for environmental impact assessment for the sector, based on footprint calculation, life-cycle assessment (LCA) and intelligent techniques. It will conduct an initial environmental analysis of rail infrastructure, identifying and quantifying all the input and output flows of the construction phase. The beneficiary will research and develop indicators, environmental criteria and assessment tools for each construction operation.

It will establish an overall methodology for evaluating the sustainability of any planned railway infrastructure. It will then develop a software prototype to enable railway construction companies to analyse the economic, social and environmental impacts of their activity. It will also explore methods for validating compliance with applicable legal and voluntary requirements and create a new manual of best practice.

Finally, the project will test the new software in the construction of two railway infrastructures with different topologies. In doing so, it will attempt to verify the validity of the tool for assessing the environmental impact of a

LIFE12 ENV/ES/000686
LIFE HUELLAS



Beneficiary:

Type of beneficiary

Research institution

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Gregorio SAINZ PALMERO

Duration of project:

42 months (01/10/2013 – 31/03/2017)

Total budget in euro:

1,408,055.00

EC contribution in euro with %:

692,276.00 (50.00%)

Theme: Land-use and Planning: Transport planning - Traffic monitoring

real-life project. It also hopes to demonstrate the successful minimisation of environmental impacts through the identification and implementation of environmental improvement measures. The pilot phase will enable the project to find an optimum balance between the science and usability of the tool.

Expected results

The project's expected results include:

- A life-cycle assessment methodology adapted to the specificities of the railway infrastructure industry;
- A software tool to enable railway infrastructure companies to conduct environmental, economic and social sustainability analyses of their activities; and
- Demonstrated benefits of the tool for improving the sustainability of two infrastructure construction projects – including a 10% reduction in the carbon footprint and a 5% reduction in the water footprint.

Integrated Planning and Sustainable Management of Sanitation Infrastructures through precision technology

Project background

According to the Strategic Research Agenda (SRA) of the Water Supply and Sanitation Technology Platform, the key priority for the European water sector is to develop low carbon-footprint technologies and concepts for water production and wastewater treatment. It is also vital that the sector balances water resources and demand, while protecting aquatic ecosystems and reducing environmental impacts by putting in place an integrated management system for water resources.

Project objectives

The general objective of the LIFE SANePLAN project is to improve sanitation management through the development and demonstration of an information system that integrates sanitation and urban planning. The project foresees the integration of all elements of sanitation (water networks and water treatment facilities) with urban planning, taking account of the involvement of multiple actors and territories, as well as current needs and future economic and environmental conditions. Specific objectives are to:

- Contribute to a reduction in the pressure on water bodies, in line with the European Water Framework Directive (2000/60/CE);
- Improve the effectiveness of sanitation systems in areas covered by the Council Directive 91/271/EEC, concerning urban wastewater treatment;
- Contribute to the development of transparent governance systems in relation to environmental information, in line with the Directive 2003/4/EC (Aarhus) on public access to environmental information;
- Contribute to the development of the white paper, 'Adapting to climate change: Towards a European framework for action (COM 2009/147)'; and
- Contribute to a better use of budgets for sanitation by promoting joint management and operation.

The project will provide information for the assessment of the status of seawater bodies in line with the Marine Strategy Framework Directive (2008/56/EC), and also on risk events generation through sanitation systems (Directive 2008/114/EC on the identification and designation of European critical infrastructures).

Expected results

From an operational point of view, the project will provide technological support to allow structured access to geo-referenced data. Such information will lead to a

LIFE12 ENV/ES/000687
LIFE SANePLAN



Beneficiary:

Type of beneficiary

Research institution

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Name of contact person

Juan Luis SOBREIRA SEOANE

Duration of project:

42 months (01/09/2013 - 28/02/2017)

Total budget in euro:

1,513,376.00

EC contribution in euro with %:

756,688.00 (50.00%)

Theme: Water:Water management and supply

system that integrates the different management needs from the relevant actors.

From an environmental point of view, the project will improve the impact of sanitation systems as a result of the improved knowledge of risk and deficiencies, and improved design of networks and facilities, based on real needs.

From an engineering point of view, the project will provide mathematical modeling of sanitation systems and the provision of results to managers through the information system. This will allow for the establishment of current and future scenarios that factor in population increases, economic and environmental constraints and the effects of climate change.

Valorisation of the digestate from pig manure as new fertilisers with organic/mineral base and gradual release

Project background

Ammonium is the basic component for the production of nitrogen fertilisers, but this process is very energy intensive as well as producing high emissions of CO₂ and nitrogen oxides. Organic fertilisers obtained from animal waste, however, can partially substitute inorganic fertilisers, but there are some difficulties linked to their variable composition, dosage and application which limit their applicability and give rise to soil, air and water pollution.

Project objectives

The objective of the project is to demonstrate an innovative system for the agronomic valorisation of waste from the anaerobic digestion (decomposition without oxygen consumption) of pig manure (digestate) and to improve the associated environmental impacts. As a result of the project actions, a new type of fertiliser will be obtained with a mixed organic/mineral base and with gradual release by the addition of the nitrification inhibitor 3-4 dimethylpyrazole phosphate (DPPP). An aqueous effluent will also be obtained and employed in fertigation.

Specific objectives include:

- Coordinated management of the demonstration plant and optimal integration of the individual steps for treating 120 m³ of digestate per day;
- Stabilisation of the digestate solid phase by composting;
- Recovery of the inorganic nitrogen from the liquid phase by stripping for its further use in the new fertilisers replacing the synthetic mineral content;
- Gradual release of fertilisers will reduce the nitrogen losses by leaching or GHG emissions such as nitrogen oxides;
- Validation of the advantages of the new fertilisers through their evaluation in field trials with wheat crops, rain fed and irrigated, in two controlled trials covering a total of around 0.7 ha, including control plots;
- Use of the water obtained as a by-product in the stripping process for the fertigation of sunflower, rain fed and irrigated. Two controlled trials will be conducted on a total of 0.7 ha;
- Promote compliance with EU legislation in the field of waste management of pig manure, especially regarding nitrates (91/676/EEC); and
- Reduction of the carbon footprint associated with agricultural activities.

LIFE12 ENV/ES/000689
LIFE MIX_FERTILIZER



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Name of contact person

Raquel LÓPEZ

Duration of project:

36 months (01/09/2013 – 31/08/2016)

Total budget in euro:

1,258,717.00

EC contribution in euro with %:

617,232.00 (50.00 %)

Theme: Waste: Agricultural waste

Expected results

- Treatment of 100% of the pig manure digestate and its agronomic valorisation as novel fertilisers, combining environmentally friendly solutions;
- Pollution reduction from nitrate leaching in at least 20% by proper design and implementation of the gradual-release fertilisers obtained in the project;
- Reduction in emissions of nitrous oxide (N₂O) by 45-50% in the wheat plots where novel fertilisers will be used compared to control plots with conventional products;
- Reduction in mineral fertiliser consumption by 30% and a dynamic internal market for fertilisers;
- A reduction of agricultural cost through the use of new fertilisers, as a single application before planting will be possible, leading to similar yields to those with conventional fertilisation; and
- Improvement in overall soil quality and increased agricultural yields after implementation of the new organic-mineral fertilisers in field trials.

Hydraulic co-generation system in water abduction and distribution network

Project background

Energy generation from fossil fuels is one of the main sources of GHG emissions. Out of the 273.3 TWh of energy generated in April 2012 in Europe, 131.9 TWh came from fossil fuels, producing 35 million tonnes of CO₂, 76 000 tonnes of SO₂ and 35 tonnes of nitrogen oxides (NO_x). Producing 'green electricity' and increasing energy efficiency are, therefore, essential in the fight against climate change.

The pumping of water uses large amounts of energy, and new approaches to make this process more efficient are required. Many drinking water systems rely on gravity for transporting water, with significant energy loss. Recovering this lost energy could help to reduce energy consumption and management costs, but current technologies require a lot of infrastructure and are very costly.

Project objectives

This project will test a new, prefabricated, hydraulic co-generation pilot plant that exploits the water flow in a water abduction and distribution network.

Specific objectives are to:

- Use kinetic and potential energy currently wasted in water distribution and supply networks;
- Generate green electricity for use in urban and/or industrial areas;
- Contribute to a reduction in the carbon footprint;
- Demonstrate the technical and economic feasibility of the modular power generator through the manufacture of a pilot plant;
- Demonstrate a reduction in the environmental impact of this plant in comparison with traditional small hydro plants installed in situ; and
- Contribute to the simplification and reduction of administrative barriers to the use of these systems.

Expected results

- Generation of 700 000 kWh of electricity from the kinetic and potential energy of water arriving at the rupture zone of Villandio;
- Reduction of GHG emissions: thanks to the use of green energy, annual emissions of 403.2 kg of SO₂, 188.3 tonnes of CO₂ and 284.9 kg of NO_x will be avoided;
- Development of a project website in order to disseminate the essential information about the environmental performance of the project;

LIFE12 ENV/ES/000695

LifeHYGENet



Beneficiary:

Type of beneficiary

Professional organisation

Name of beneficiary

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Name of contact person

Alejandro FERNÁNDEZ

Duration of project:

38 months (01/07/2013 – 30/08/2016)

Total budget in euro:

1,775,668.00

EC contribution in euro with %:

718,363.00 (50.00 %)

Theme: Climate change – Energy: Energy supply

- At least three project meetings; and
- At least 30 entities interested to the project results, including commitments for futures activities.

Demonstration of an integral and sustainable system for multi-waste recycling and valorisation

Project background

Spain accounts for 14% of the EU's livestock, producing around 76 million tonnes of manure every year. About 70% of this manure is used as fertiliser, giving a new use. However, mismanagement of manure can lead to soil, air (greenhouse gas emissions) and water pollution (eutrophication).

The plastic industry is another important source of waste and pollution. Between 2009 and 2010, Europe consumed 57 million tonnes of plastic, of which some 10.4 tonnes were unrecoverable waste.

Project objectives

The aim of the project is to demonstrate the sustainable management of a broad spectrum of waste (industrial waste, waste treatment plant waste and agrofood waste) in an integrated plant. This objective will be achieved through the development and practical application of a 'mixed plant' concept, which will support a new waste management strategy, based on separation, pre-treatment, recycling and valorisation.

In order to maximise the benefits of an integrated plant for all the abovementioned categories of waste, two different processes will be integrated. The first is an anaerobic digestion system, for the transformation of easily biodegradable organic waste into biogas, and the second is a low-temperature pyrolysis (chemical) treatment, for the valorisation of the non-recyclable plastic waste fraction. Biogas, together with pyrolysis gases, will be used as fuel in an adapted cogeneration engine. As an added value, and in order to close the cycle with a minimum environmental impact, the digestate generated in the anaerobic reactor will be used as a slow-release fertiliser, while the solid fraction obtained in the pyrolysis process will be transformed into carbon pellets, and the liquid fraction will be used in second generation biofuels.

Expected results

- 80% savings in thermal and electric energy generation costs in comparison with a bio-digestion plant operating independently;
- 15% savings in thermal and electric energy generation costs in comparison with a non-recyclable plastic waste pyrolysis plant operating independently;
- Enhanced value of all the digestate generated in the anaerobic process as a slow-release fertiliser, with reduced toxicity to plants and less nitrogen loss in the soil;

LIFE12 ENV/ES/000727
LIFE REVA-WASTE



Beneficiary:

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Name of contact person

Dolores HIDALGO

Duration of project:

36 months (01/10/2013 – 30/09/2016)

Total budget in euro:

1,705,452.00

EC contribution in euro with %:

770,724,00 (50.00 %)

Theme: Waste: Waste recycling

- 65-80% reduction in the environmental impact associated with landfill disposal of the non-recyclable fraction from waste treatment plants;
- Volatile solids removal yields of at least 90%: if the co-digestion plant treats about 6 500 m³ of slurry and co-substrates per year, then the minimum generation of methane gas would be 300 m³ a day (3 000 kWh);
- Nitrogen recovery yields in the digestate as struvite of 95-100%: assuming the digestate has a nitrogen content of 3.5 kg/t and 2.6 kg/t of phosphorus, a struvite production of about 1 tonne a day can be reached; and
- Liquid, solid and gas phase yields in the pyrolysis process of around 7%, 3% and 90% respectively.

Fast Direct Atmospheric Dioxin Detection

Project background

Incineration of municipal solid waste releases highly toxic pollutants into the environment. The gases emitted are persistent organic pollutants, including dioxins, which are highly toxic and bioaccumulative in the food chain. These pollutants can travel long distances and have an adverse affect on people and the environment.

The term 'dioxin' refers to 75 congeners of polychlorinated dibenzo-p-dioxins (PCDD) and 135 polychlorinated dibenzofurans (PCDF). Among these compounds, 17 contain chlorine atoms and are toxic to, and can accumulate in the environment, animals and humans.

Dioxins are responsible for a variety of health problems. The most toxic of the dioxins has been classified as a 'true human carcinogen' by the International Agency for Research on Cancer. Research shows that they contribute to the local pollution of soils and vegetation and have a negative impact on the health of exposed populations. However, such analysis is difficult to carry out. The high toxicity of these compounds at very low concentrations means very sensitive analysis techniques are necessary.

Project objectives

The main objective of the project is to apply a new analytical technique for the quantification of dioxin, and the continuous tracking of PCDDs/PCDFs concentrations in air, soil and biota (vegetal) in the area surroundings a municipal solid waste (MSW) incineration facility. The new analytical technique will help to evaluate the dispersion and deposition of these pollutants in the environment, thereby facilitating efforts to reduce their environmental impact.

The project proposes a new analytical approach, based on the combination of a secondary electrospray ioniser that achieves very high ionisation efficiency, a differential mobility analyser that select ions according to their mobility, and that has very good transmission, and a triple quadrupole mass spectrometer. The proposed technology is capable of detecting vapours below the level of parts per quadrillion (ppq) and could help to establish security measures to protect the population and the environment.

Expected results

- Improvements in the analytical equipment itself:
 - Increased operating temperature, above 400°C, in order to detect dioxins;

LIFE12 ENV/ES/000729
LIFE DIOXDETECTOR



Beneficiary:

Type of beneficiary

Research institution

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Name of contact person

Marta GÓMEZ

Duration of project:

29 months (01/10/2013 – 29/02/2016)

Total budget in euro:

1,126,854.00

EC contribution in euro with %:

563,201.00 (49.98 %)

Themes: Air and Noise: Air quality monitoring / Risk management: Pollution control

- Greater sensitivities (concentrations) of up to 10fg/100ml of air; and
 - Ability to separate different dioxin congeners, according to their physical properties.
- Specific results related to the evolution of dioxin concentrations, from their emission to their deposition in the different environments. These results will provide a better understanding of the dioxin pathways, thereby providing a greater insight into the problem of population exposure, and thus allowing it to be tackled more efficiently.

Surface Treatment for Asphalt pavements to Nitrogen oxides removal in Urban Environments

Project background

Nitrogen oxides (NO_x) are one of the main atmospheric pollutants generated by human activities, especially traffic, which accounts for around 70% of the total emissions. Through photolytic reactions this pollutant is responsible for the production of acid rain and smog, which have a very negative impact on human health.

Project objectives

The main objective of the project is to develop the concept of 'new anti-polluting roads' and apply it to cities. Combined with new management structures, urban traffic control and other measures, the concept will help reduce NO_x in urban areas. The technology used for eliminating NO_x is heterogeneous photocatalysis using the photocatalyst titanium dioxide (TiO₂) and solar radiation. In the laboratory, this treatment has been shown to remove NO_x.

Specific objectives include:

- Submitting the system to a normalisation and standardisation process, meeting the legislative and technical requirements, ahead of its exploitation in new markets;
- Analysing the system from an environmental and socio-economic point of view through the data obtained in the course of the project; and
- Disseminating in a broad and direct way this kind of innovative system.

The project also aims to demonstrate the new process in a pilot area of Madrid with a view to subsequent large-scale commercialisation.

Expected results

The project expects to achieve the following results:

- A demonstration of the effectiveness of the system for reducing urban pollution, especially levels of NO_x (by around 30-40%);
- The treatment of some 100 000 m² of asphalt pavement in Madrid, leading to a 25% reduction in levels of NO_x; and
- Transferable results that can be applied in other areas in Madrid and other cities in Europe with the same environmental problems.

LIFE12 ENV/ES/000749
LIFE EQUINOX



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Name of contact person

José FERMOSO

Duration of project:

36 months (01/10/2013 – 30/09/2016)

Total budget in euro:

1,785,717.00

EC contribution in euro with %:

739,649.00 (47.03%)

Theme: Industry-Production: Building

Collection and recycling of expanded polystyrene (EPS) in the urban zone of Valladolid

Project background

Waste volumes remain a growing problem for EU Member States. For example, waste streams in landfills from used expanded polystyrene (EPS) have increased dramatically in recent years. EPS is not biodegradable and because of its low density, it requires large amount of landfill space.

In Spain, around 80% of EPS is sent to landfill (circa. 32 000 t/year) and the remaining 20% is incinerated. Effective solutions are needed to reduce EPS waste volumes and promote more sustainable consumption patterns.

Project objectives

The main objective of the project is to establish a demonstration plant to recycle EPS waste and produce pearls of EPS. These pearls will be used to manufacture new prototype products. Through this process, the life cycle of expanded polystyrene will be extended, giving an added value to this waste stream and reducing the amount of EPS being sent to landfill or incinerated.

The project actions will be carried out in the urban area of Valladolid and the outcomes will make a valuable contribution to the aims of the EC Directive 2008/98/EC on waste management, by reducing waste going to landfill and increasing recycling.

The new prototype products will have applications in the food sector and will have the advantage of being designed specifically for the end user, with enhanced features compared to existing products. The performance of the new prototype products (boxes for food products) will be optimised using an analysis of factors such as compressive strength, thermal conductivity, dimensional stability, water absorption, and water vapour permeability. This work will ensure that the new products are fully fit-for-purpose as recycled material.

The project will also undertake a study of logistical and collection alternatives for EPS waste, in order to identify a more optimal management model. This knowledge will be augmented by findings from an evaluation carried out during the project, exploring industrial implementation options, as well as the environmental and socio-economic impact of such a novel waste management approach in urban areas such as Valladolid.

LIFE12 ENV/ES/000754
LIFE COLRECEPS



Beneficiary:

Type of beneficiary

Research institution

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Name of contact person

José FERMOSE

Duration of project:

39 months (01/10/2013 – 30/12/2016)

Total budget in euro:

1,201,933.00

EC contribution in euro with %:

600,966.00 (50.00 %)

Theme: Waste: Municipal waste (including household and commercial)

Expected results

Some of the expected outcomes will be:

- To obtain accurate data on the amount of EPS generated in the urban zone of Valladolid;
- To develop a collection and logistical model of EPS waste in order to treat the EPS waste properly;
- To treat more than 50% of the EPS waste generated in the Valladolid urban zone, reducing by an equivalent amount EPS waste going to landfill and incineration;
- To treat 100% of EPS waste entering the pilot plant, demonstrating, at pre-industrial scale, the effectiveness and efficiency of the EPS recycling system;
- To build and operate a prototype plant for EPS recycling with a capacity of 500 kg of EPS waste daily, avoiding 146 000 kg/year of EPS waste going to landfill and 36 500 kg/year of EPS waste going for incineration; and
- To obtain a quality EPS recycled end-product, suitable for use in the manufacture of new EPS products with high value and with improved characteristics in comparison to products currently on the market.

Lab to field soil remediation demonstration project: New ISCO application to DNAPL multicomponent environmental problem

Project background

Toxic residues from the former production of the pesticide, Lindane, present a pollution risk at the Bailín landfill, in Spain's Aragon region. A pollution plume is now emerging which is contaminating soil, water and aquifers. Significant levels of diffuse pollution are also present in the surrounding soil and water. New methods for mitigating such pollution problems are sought that could not only tackle the Bailín hazard, but also be replicated elsewhere, where similar problems exist.

Project objectives

The main aim of the project is to design, install and operate a prototype pollution mitigation system that will use In-Situ Chemical Oxidation (ISCO) with alkaline activation to restore water quality in aquifers that have been contaminated by lindane from landfill sites. Once the pilot test is completed, and all information and results have been collected and interpreted, the project will assess the technical and economic feasibility of a full scale programme of aquifer remediation in the polluted area.

Project actions will focus on: demonstrating the feasibility of ISCO techniques in lab and field conditions; carrying out risk reduction assessments according to specific environmental quality indicators; preparing innovative approaches for adapting ISCO technologies to the existing pollutant mixture; assessing the full-scale applicability and effectiveness of these techniques (via evaluation of ratios such as cost/effectiveness/times, cost/treatment times/energy consumption, and feasibility/efficiency of the pollution reduction); and analysing the applicability and transferability of these techniques to the decontamination of similar sites.

Expected results

In relation to the ISCO pilot test with alkaline activation, it is expected that the results will reduce pollutant concentrations in the target site. Positive effects will be observed in the form of oxidised/reduced pollutants, the volume of treated water, and the amounts of waste extracted. An assessment will be made available that details the pilot test's effectiveness as a method for treating the specific mix of target pollutants. A dosage evaluation and quantification will also be conducted during this pilot stage of the project.

In relation to the project's full scale implementation study, the key result will be an assessment of the tech-

LIFE12 ENV/ES/000761
DISCOVERED LIFE



Beneficiary:

Type of beneficiary

Regional authority

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Carlos CACHO NERIN

Duration of project:

42 months (01/01/2014 – 30/06/2017)

Total budget in euro:

1,123,305.00

EC contribution in euro with %:

529,459.00 (49.97 %)

Theme: Risk management: Site rehabilitation – Decontamination

nical and economic feasibility of scaling up the pilot system. This will include assessment and reference tables on cost, effectiveness, treatment time and tested techniques viability for DNAPL treatment and pollutant plume, as well as cost/benefit ratios and a socio-economic impact assessment. This knowledge will inform a set of associated methodological guidelines.

It is expected that the project will also help to increase awareness among stakeholders on the relevance of addressing environmental issues at Bailín. The project will also foster collaboration between the different agencies involved in tackling pollution.

Supermarket retrofit for zero energy consumption

Project background

The retail sector is a vital part of the European economy. Recent figures cited by the European Commission show that retail services contribute €454 billion to the EU economy, which equates to 4.3% of total EU GDP.

Food is an important element of the retail sector. In Spain alone there are more than 50 000 food retail outlets, with nearly 20 000 supermarkets. However, this sector is a particularly high consumer of energy. Without even including transport and distribution, food retail outlets themselves consume, on average, around 330 kWh/m² per year. The cooling of perishable goods to around -10°C accounts for around 50% of this energy demand, whilst a further 20% is consumed in the freezing of products (-35°C). The rest of the energy demand comes from lighting (20%), air conditioning, and other uses.

Project objectives

The LIFEZEROSTORE project aims to demonstrate the first ever energy-neutral supermarket. This will be based on both the introduction of energy-efficient systems and the generation of energy from renewable sources. The project aims to show that it is technically and economically feasible to achieve zero consumption, not just in a newly designed supermarket, but also by retrofitting existing ones.

The project specifically aims to turn a supermarket with a surface area of 2 060 m² and an estimated power consumption of 400 kWh/m² per year into the first energy-neutral supermarket. This will be achieved by retrofitting with a combination of three technologies: biomass; absorption; and co-generation. Together these represent a tri-generation solution.

The project hopes to overcome the challenges of introducing bioclimatic architecture and meeting the energy requirements of cooling food to -35°C independently of the electricity network. It expects to show that such a system is not only feasible to implement as a retrofitting solution, but also reliable, with low ongoing maintenance requirements.

By demonstrating the potential for retrofitting, it hopes to eventually enable the transformation of all EROSKI stores in Spain. This would result in a dramatic reduction in energy consumption and greenhouse gas emissions. Its use in all stores and supermarkets in Europe, for ex-

LIFE12 ENV/ES/000787
LIFEZEROSTORE



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

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Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

1,924,479.00

EC contribution in euro with %:

887,239.00 (50.00 %)

Themes: Climate change - Energy: Energy saving / Services and Trade: Trade

ample, would reduce total EU electricity consumption by up to 3%. The project will also explore whether extra energy beyond the needs of the supermarket(s) can be generated and sold on the energy markets.

Expected results

- A power consumption reduction of 824 MWh per year in the demonstration supermarket through energy saving measures, equating to a reduction in CO₂ emissions of 296.64 t/year;
- Successful application of a tri-generation energy solution, based on biomass, cogeneration and absorption technologies adapted to a 2 060 m² supermarket. This will fully meet all energy needs, including the -10°C and -35°C temperature requirements for food storage;
- The demonstrated reliability and low maintenance requirements of the retrofitted system, and its overall economic and technical feasibility; and
- An evaluation of possible energy reuses for surplus energy generated.

Field and laboratory methods for the environmental evaluation of biocides within the European regulatory framework

Project background

The impact of biocidal products on the environment is significant and this has led to increased regulation in recent years. The European regulatory framework for biocides is established in the Biocidal Products Directive (98/8/EC) and the Biocidal Product Regulation, approved in 2012 (EU 528/2012).

This European legislation establishes the need to carry out risk assessments for biocidal products and specifies the data required to perform them. A crucial measurement is the risk quotient, as calculated by the PEC-PNEC ratio. A biocidal product is judged to be environmentally acceptable if the Predicted No Effect Concentration (PNEC) - the concentration that causes no adverse effect to the Environment - is higher than the Predicted Environmental Concentration (PEC) - the concentration one expects to find in the environment.

Project objectives

The main objective of the LIFE BIOREG project is to improve the quality and strength of biocidal risk assessments. The project hopes to develop new methodologies that will provide precise and robust data for conducting risk assessment of biocidal products, as well as more information on the influence on risk of different parameters.

It specifically aims to establish a scientifically validated methodology for the risk assessment of film preservatives (PT7) and masonry preservatives (PT10), which will be the next biocides studied and authorised under the biocidal products legislation.

The project will optimise laboratory and semi-field experimental methods for determining the leaching of active ingredients from PT7 and PT10 product types, and explore the possibility of defining standardised procedures for determining leaching. It will then assess the eco-toxicity of the leachates obtained in the laboratory and semi-field studies and correlate the results with the eco-toxicological data obtained from the pure formulated product.

It expects to determine the most relevant factors affecting the results and performance of leaching tests and the most important parameters for risk assessment. The methodologies and results will be published with guidelines to perform environmental risk evaluation of

LIFE12 ENV/ES/000814
LIFE BIOREG



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Research institution

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Name of contact person

Joana VITORICA

Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

631,180.00

EC contribution in euro with %:

315,590.00 (50.00%)

Theme: Risk management: Risk assessment and monitoring

PT7 and PT10 products, with a view to their possible registration. It hopes to enable the regulatory authorities to establish robust biocidal risk assessment, have confidence in the resulting data and avoid unnecessary trials and delays.

Expected results

- A scientifically robust methodology of biocidal risk assessment for PT7 - film preservatives - and PT10 - masonry preservatives;
- Calculation of the eco-toxicity of the pure biocidal product, as well as of the leachates obtained and the relation between the two;
- Definition of the most relevant factors affecting risk assessment;
- Reduced delays in the delivery of risk assessments; and
- Improved confidence in the rigour of biocidal risk assessments.

Zero Liquid Discharge desalination: brine treatment based on electro-dialysis metathesis and valuable compound recovery

Project background

Brine discharge from Europe's water desalination plants represents a potential hazard for marine ecosystems. Brines are commonly disposed of using inland desalination plants, deep well injection, or by discharge into surface or ground water. However, the impact of these options can be greater than discharging the brine directly into the sea and can result in severe salinity problems in water sources, as well as in adjacent soils.

The disposal of brine from desalination plants into water bodies conflicts with the objectives of the Water Framework Directive (2000/60/EC) and, therefore, it is necessary to implement brine management strategies that do not include its release into the environment

Project objectives

The main objective of the LIFE+ ZELDA project is to demonstrate technically feasible and economically sustainable methods for improving the environmental performance of desalination systems through brine management strategies that apply electro-dialysis metathesis (EDM) and valuable compound recovery processes. The ultimate aim is to achieve zero liquid discharge (ZLD).

The specific objectives of the project are, by order of importance:

- To design, construct and implement an EDM system for reducing the total volume of brine generated, and concentrating it in full-scale seawater and brackish water desalination plants;
- To integrate conventional separation processes into the EDM system in order to facilitate the recovery of valuable compounds from brines;
- To demonstrate the technical feasibility and sustainability of the proposed technology for achieving ZLD in existing seawater and brackish water desalination systems;
- To quantify and disseminate information on the environmental benefits and the economical impact of the new EDMZLD process in seawater and brackish water desalination systems;
- To promote the implementation of environmental policies and strategies for quantifying and minimising the environmental impact of desalination systems.

Expected results

- The characterisation of the novel membranes developed by FUJIFILM in terms of electrical resistance, per-

LIFE12 ENV/ES/000901
LIFE+ ZELDA



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Name of contact person

David SMITH

Duration of project:

48 months (01/07/2013 – 30/06/2017)

Total budget in euro:

2,301,553.00

EC contribution in euro with %:

1,021,775.00 (50.00 %)

Theme: Water: Water management and supply - Water scarcity and draught

- maselectivity, water permeation and ionic exchange capacity, as well as ion rejection and energy consumption and its impact on the overall EDM process;
- A versatile brine treatment system based on EDM that can be used in both seawater and brackish water desalination plants;
- A zero liquid discharge (ZLD) process based on valuable compound recovery strategies and adapted to treat the output streams of the EDM system in both seawater and brackish water desalination brine treatment;
- Data concerning the performance (type, quantity and purity of the compounds recovered) and operational costs of the ZLD process;
- 5 000 m³ of brine from seawater and brackish water desalination plants treated using the EDM-ZLD technology;
- 4 500 Kg of valuable compounds recovered from the brine treatment in a seawater desalination plant;
- 1 300 Kg of valuable compounds obtained from the brine treatment in a brackish water desalination plant.

LIFE Zero Residues: towards a sustainable production and supply chain for stone fruit

Project background

Due to recent food scandals, consumers are increasingly concerned about product quality and are demanding healthier foods. Supermarkets are responding to this demand and sourcing food from more sustainable production systems. Low-residue production methods are widely available for vegetables and often demanded by retailers. However, for stone fruit there are currently no such methods. Furthermore, organic (eco), fresh produce is still an expensive option compared to conventional produce, due to high production and logistical costs.

Project objectives

The LIFE Zero Residues project aims to improve sustainability and quality in the stone fruit supply chain. It specifically hopes to develop a zero-residue production method for stone fruit, achieving supply-chain improvements - including in processing and post-harvest conservation - and increasing consumer demand for such products. In this way, the project aims to improve the competitiveness and green credentials of the sector.

To achieve the project aims, the beneficiary will implement several interrelated actions, including:

- The implementation of integrated pest management in stone fruit production - drastically reducing pesticide doses, soil degradation and groundwater pollution;
- High-pressure processing - pascalisation - of the waste fruit created by quality imperfections - for valorisation in profitable new markets, such as for baby food;
- Applying innovative micro-perforated packaging and controlled atmosphere storage solutions - for increased post-harvest shelf life, easier logistics and to avoid waste down the supply chain; and
- Conducting relevant market studies, test panels, active marketing through social media, and promoting actual sales in supermarkets - demonstrating and contributing to increasing demand for these products.

The project will undergo a zero-residue certification process to ensure efficient and consistent production methods, whereby disruptions, delays and associated costs are minimised. The methodology will secure the same or better fruit quality than conventional methods, and ensure visual acceptance by consumers. It ultimately hopes to promote both the supply of, and demand for, zero-residue stone fruits, setting a new trend in (stone) fruit production.

LIFE12 ENV/ES/000902
LIFE Zero Residues



Beneficiary:

Type of beneficiary

University

Name of beneficiary

Universidad de Zaragoza

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Name of contact person

Rosa ORIA

Duration of project:

48 months (16/09/2013 - 30/06/2017)

Total budget in euro:

3,445,458.00

EC contribution in euro with %:

1,635,232.00 (48.81%)

Themes: Industry-Production: Agriculture - Fisheries / Risk management: Human health protection

Expected results

- Achievement of external certification for a zero-residue production process for stone fruit;
- 75% of the harvest realised in the project to comply with the objective of zero residues (< 0.01 mg/kg of any detectable residue);
- Decrease of residual chemicals in the soil by 20% at the end of the project, compared to the situation at the beginning of the project;
- A 20% increase in the shelf-life of the resultant fruit, compared with conventionally produced and packaged fruit;
- The ZR products to be sold at a 10% premium compared to the conventionally produced products; and
- Successful pascalisation of 80% of discarded fruit and proven interest from baby-food manufacturers.

Eucalyptus Integrated Wood Processing Project

Project background

Eucalyptus plantations generate a significant amount of biomass residues in the form of branches and leaves – estimated for Spain and Portugal at some 2.8 million tonnes/yr. However, there is potential to transform the waste eucalyptus branches and leaves to make new products locally. As well as using them as a source for extracting some of the standard products associated with eucalyptus trees, they could also provide a source of biomass for generating heat and electricity.

Project objectives

The project aims to increase the efficiency of the valorisation of eucalyptus biomass. By adding value to leaves and branches that would otherwise be treated as waste, it hopes to improve the sustainability of eucalyptus forests/plantations. This should improve the quality of the forest, reducing waste and environmental threats at the same time as improving the economic activity of rural areas.

Specific objectives of the project include:

- Undertaking a technical and economic analysis of electricity production from eucalyptus branches and leaves. It will work to optimise the efficiency and sustainability of this electricity production;
- Developing intelligent pellets using biochar and studying their effectiveness as a carbon storage tool through a complete carbon balance of the project. It will test its reliability and examine the potential use of biochar as a biofuel;
- Improving the recovery of valuable products from a pyrolysis plant – which is used to produce charcoal from eucalyptus. Notably, it hopes to demonstrate its potential as a biorefinery, by using the organic phase of the pyrolysis liquids as a biofuel and for producing valuable chemicals;
- Integrating the whole processes of: biomass harvest; pyrolysis; syngas clean-up; electricity generation; and biochar utilisation; and
- Exploring the potential of using other biomass sources, such as municipal green waste or agricultural residues, to supplement the eucalyptus material.

The project expects to demonstrate improved sustainability of eucalyptus forests, with positive impacts on soil fertility, wood yields, soil erosion, tree diseases and forest fires. It will hope to show these environmental advantages together with increased economic activity in rural areas and an analysis of the social effects of the full implementation of this project in Spain.

LIFE12 ENV/ES/000913
LIFE Eucalyptus Energy



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

Ingeniería de Manutención Asturiana S.A.

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Name of contact person

Xaranzana RODRÍGUEZ

Duration of project:

36 months (02/09/2013 – 02/09/2016)

Total budget in euro:

1,776,197.00

EC contribution in euro with %:

845,098.00 (50.00 %)

Themes: Industry-Production: Wood – Furniture /
Waste: Waste recycling

Expected results

- Production of 1 176 Gwh/yr of renewable electricity from eucalyptus biomass;
- Prevention of 403 million tonnes of CO₂ emissions/yr by replacing fossil fuel;
- Production of 280 000 tonnes/yr of biochar as a carbon sink;
- Removal of 1 120 million tonnes/yr of CO₂ from the atmosphere;
- Production of valuable oils and chemicals;
- Additional CO₂ emissions reductions from other biomass sources such as municipal green waste or agricultural residues;
- Improved soil quality and reduction of risk of forest fires; and
- More sustainable rural economic activity and social benefits.

Environmental recovery of peri-urban spaces through actions in the ecosystem and organic agriculture.

Vegetation gardens LIFEKMO

Project background

The city of Zaragoza in north-east Spain has historically been surrounded by fertile alluvial soils providing high productivity for the growing of fruit and vegetables. These peri-urban 'Gardens of Zaragoza' (Huerta de Zaragoza) were able to meet local demand for these natural products. As recently as 2003, Zaragoza had 2 600 ha dedicated to such agriculture.

However, in the past decade it is estimated that 90% of this productive area has been lost. It has suffered from the abandonment of traditional farming in the face of competition from cheap imports – from other areas of Spain and abroad. Areas have been abandoned, turned over to intensive agriculture or lost to relatively disorderly processes of urban expansion. There are currently only four farmers with organic certification in the area.

Project objectives

The project aims to recover the natural peri-urban Gardens of Zaragoza through the promotion of a 'zero kilometre' (km0) concept of local agricultural production. It expects to demonstrate a successful approach for implementing the European Territorial Strategy (ETS), delivering economic, social, health and environmental benefits.

The project will undertake the following main actions:

- Provide training and technical assistance to entrepreneurs who want to develop a business in local non-intensive farming;
- Support the creation of urban allotments in which individuals can grow their own fruit and vegetables;
- Promote locally-produced organic products amongst consumers and retail outlets in Zaragoza;
- Monitor and improve ecological corridors; and
- Create a management body to support the ongoing development of local organic farming, including representatives of the City Council, farmers, research institutions and consumers.

By demonstrating the economic incentives for environmentally-friendly local production, it hopes to create a sustainable model of local productivity that will:

- Increase non-intensive cultivation of plots of land in the Gardens of Zaragoza;
- Halt the environmental degradation of this area; remediate and improve soil fertility; regenerate the natural environmental system; and protect local biodiversity; and

LIFE12 ENV/ES/000919
HUERTAS LIFE KMO



Beneficiary:

Type of beneficiary

Local authority

Name of beneficiary

Ayuntamiento de Zaragoza

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Name of contact person

Javier CELMA

Duration of project:

40 months (02/09/2013 – 30/12/2016)

Total budget in euro:

1,759,098.00

EC contribution in euro with %:

729,955.00 (48.07 %)

Theme: Industry-Production: Agriculture – Fisheries

- Deliver an increase in quality, autochthonous and traditional varieties of fruit and vegetables for sale locally.

Expected results

- Creation of new farms in the Gardens of Zaragoza with plots from 1 to 5 ha;
- Increase in the number of certified organic farmers in Zaragoza from four to 25;
- Increased production of autochthonous and traditional varieties of fruits and vegetables for sale locally;
- Creation of a point for direct sales of these products in at least one municipal market, 10 greengrocers and five restaurants;
- Involvement of at least 30 restaurants in an awareness and information campaign;
- Reduction of CO₂ emissions by some 32% through the transition to organic farming;
- Avoidance of some 30 tonnes of CO₂ from reduced transport of fruit and vegetables; and
- Creation of at least 25 jobs in local agriculture.

Demonstration of hygienic eco-design of food processing equipment as Best Available Technique

Project background

Cleaning activities consume large amounts of water and chemicals, including alkalis, acids and disinfection agents. This generates large amount of contaminated wastewater and organic waste. Cleaning is also one of the most energy-consuming operations in the food industry, generating climate change inducing greenhouse gases, including from fuel combustion for steam production and high temperature processes. In both dairy and fish processing sectors – both represented by a company in the project consortium – cleaning and disinfection is considered to be the main source of environmental impacts.

Project objectives

The LIFE ECO-DHYBAT project aims to demonstrate that “hygienic eco-design” techniques for food processing equipment could be considered a candidate for Best Available Technique (BAT) in the updating of the BAT Reference Document (BREF) in the food sector. It hopes, therefore, to develop a pollution-prevention approach that will contribute to reducing the significant environmental impact of sanitation procedures in the European food sector.

The project will develop four industrial-scale demonstration production lines that are representative of those in European dairy and fish-processing industries. The equipment configuration will be re-designed following new hygienic and environmental criteria. Trials will be performed to generate suitable experimental data on the hygienic performance of the new eco-design.

Through the application of a Life Cycle Assessment (LCA) approach, the beneficiary hopes to demonstrate that hygienic eco-design of food equipment is a cost-effective approach to reducing the consumption of water, energy and chemical cleaning agents, and to reducing wastewater and CO₂ emissions during sanitation processes.

The project will promote the hygienic eco-design of processing equipment as a candidate for BAT in the next updating of the Food, Drink and Milk BREF. It will also work to develop eco-design guidelines and certification procedures for use by the European food equipment sector. Ultimately, the project hopes to support the widespread use of hygienic eco-design in the Euro-

LIFE12 ENV/ES/001070
LIFE ECO-DHYBAT



Beneficiary:
Type of beneficiary
Professional organisation

Name of beneficiary
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Name of contact person
Alfredo RODRIGO

Duration of project:
36 months (10/10/2013 – 30/09/2016)

Total budget in euro:
874,089.00

EC contribution in euro with %:
434,244.00 (50.00%)

Themes: Environmental management: Cleaner technologies / Industry-Production: Food and Beverages

pean food industry, with an associated reduction in its environmental impact.

Expected results

- Sufficient data generated about hygienic eco-design of food equipment to enable its assessment by the IPPC Bureau as an emerging technique for the next updating of the Food, Drink and Milk BAT Reference Documents (BREF);
- Reduced consumption of chemical cleaning agents;
- Reduced water consumption in the cleaning of food equipment by 10-30% - depending partly on the type of equipment;
- Reduced energy consumption by 10-20%;
- Reduced total CO₂ emissions - direct and indirect - related to the cleaning of food equipment by 20-30%;
- Reduced organic load and chemical contamination of wastewater generated by cleaning activities in the food sector.

RIVERLINK

Project background

The area around the Segura River Basin (in the south-east of Spain) has historically experienced significant climatic extremes and water imbalances, going from extended periods of drought, through torrential rains and frequent flooding. This spatial and seasonal variability has, for centuries, led to efforts to control the river in order to make use of it for human activity. For this reason, the river basin is one of the most regulated in Europe with numerous fluvial obstacles - mostly dams and weirs.

Project objectives

The project aims to promote and support the environmental recovery of the Segura River Basin. Specifically, it plans to demonstrate and validate three management measures for developing a green infrastructure approach to river basin management.

The project will remove one weir, construct fish passages across eight others, and implement supporting fluvial restoration practices. These three river basin management measures will be implemented on selected sites over a 54 km distance - including both protected and non-protected areas. The area covered will include rivers in urban areas, as a means of facilitating stakeholder engagement.

The project hopes to demonstrate that the implementation of this green infrastructure approach - still uncommon in Mediterranean areas - will increase river permeability and longitudinal continuity, help the recovery of the natural ecosystem, restore biodiversity resilience and increase the mobility of species along the river. It also hopes to reverse landscape fragmentation by reviving the green corridor role of the river and the connectivity between protected areas.

Monitoring activities will assess the performance of these measures with the hope of validating the green infrastructure approach to river basin management and its possible extension to the official River Basin Management Plan (RBMP).

The project will also develop a Land Custody Network to integrate private owners in the river management and in agreeing good practices, increasing the links between the river and neighbouring lands.

The project hopes to pave the way for restoration of the longitudinal permeability along the whole river length

LIFE12 ENV/ES/001140
LIFE SEGURA RIVERLINK



Beneficiary:

Type of beneficiary

Public enterprise

Name of beneficiary

Confederación Hidrográfica del Segura

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Name of contact person

Eduardo LAFUENTE SACRISTÁN

Duration of project:

48 months (01/08/2013 - 30/07/2017)

Total budget in euro:

3,424,250.00

EC contribution in euro with %:

1,655,555.00 (49.83%)

Theme: Water: River basin management

- 325 km - over a 15 year period. As well as promoting the recovery of the ecological functions of the wider Segura River Basin, the project also hopes to make a broader contribution by demonstrating the implementation of the EU Water Framework Directive (WFD).

Expected results

- Removal of a weir and adaptation of eight others to provide fish passages;
- Improvement of the longitudinal river permeability along 54 km;
- Increased migration of fish - and other aquatic life - along the river;
- Increased cooperation amongst relevant public and private stakeholders through a Land Custody Network;
- Improved conservation of riparian habitats, restored ecosystems and increased biodiversity in the river basin;
- Validation of the green infrastructure approach for inclusion in the Segura River Basin Management Plan;
- Progress towards achieving good ecological status for the river.

Multispectral visual monitoring of the impact of civil engineering works on the environment

Project background

Environmental Impact Assessments (EIAs) have been used for several decades as a tool to prevent or quickly identify any environmental damage arising from an activity. The assessments involve identifying, predicting, evaluating and mitigating the environmental, social, and other relevant potential impacts of works, such as civil infrastructure. They are used to inform rational decision-making that understands the potential long-term impact of a project. However, the success of the methodology depends on the experience and knowledge of the technicians responsible for its application and interpretation.

Project objectives

The project aims to provide a more objective system of conducting environmental impact assessments. It specifically targets automation and integrated control of the range of environmental monitoring elements. This will act as a key supporting tool for environmental monitoring plans and help efficiently prevent and control the direct and indirect environmental impacts of civil works.

The project will develop a methodology for monitoring and measuring environmental indicators based on innovative technologies, such as multispectral vision and remote sensors. It will cover elements including population, wildlife, flora, soil, water, air, climatic factors, natural resources, local heritage and landscape. To implement the methodology, the project will develop three validated prototype monitoring and tracking devices: a mobile device; a fixed device; and a portable handheld device.

It will apply technological advances in GIS to enable the integration and remote control of the monitoring and measuring systems. It will cover the site of any works and also the surrounding areas, including rivers, protected areas, urban areas and so on. The aim is that this GIS tool will be easy-to-use in any civil works project, enabling monitoring of every relevant environmental impact according to the particular characteristics of each project.

Finally, the project will develop a software platform to provide decision-makers with access to the tracking information and environmental sustainability indicators. This aims to reduce actuation times from the identification of any environmental risk or damage and thus avoid the deterioration of the environment, in many cases with a high nature value. It will also avoid any costs related to necessary corrective actions or possible legal sanctions.

LIFE12 ENV/ES/001163
VISIONTECH4LIFE



Beneficiary:

Type of beneficiary

Development agency

Name of beneficiary

Fulcrum Planificación Análisis y Proyectos S.A.

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Name of contact person

José Pablo ORMAECHEA

Duration of project:

45 months (01/07/2013 – 30/03/2017)

Total budget in euro:

1,876,321.00

EC contribution in euro with %:

916,183.00 (50.00 %)

Themes: Land-use and Planning: Urban design (urban-rural) / Risk management: Risk assessment and monitoring

Expected results

- A more objective and efficient system for monitoring and assessing the environmental impact of any works;
- To reduce the measuring and tracking time of environmental impacts by 40-80%;
- To reduce the response time to environmental impact by almost 90%;
- To prevent and avoid several forms of environmental impact;
- 40% cost savings through the avoidance or simplification of corrective works;
- To provide recommendations on improving European regulations and best practice to reduce the environmental impact of civil works projects; and
- To support the development of an eco-label or similar validation of sustainable civil works in the future.

Efficient Management of Energy Networks

Project background

Key political priorities for the EU are to reduce both its energy dependency and its greenhouse gas emissions contributing to climate change. The EU has set the strategic goal of cutting greenhouse gas emissions by 20% by 2020 and has made important related commitments through international agreements such as the Kyoto Protocol.

Improving the energy efficiency of buildings can make an important contribution to achieving these goals. The EU Directive on the Energy Performance of Buildings (2010/31/EU) highlights that “buildings account for 40% of total energy consumption in the Union”. Furthermore, the buildings sector is expanding, generating further increases in energy consumption. This makes efficiency improvements in this sector particularly relevant.

Universities, as institutions, tend to have large buildings with many thousands of users. Levels of energy consumption for light, heating and equipment use are high, with a corresponding impact on greenhouse gas emissions associated with electric and thermal generation.

Project objectives

The project aims to develop and demonstrate an effective energy networks management system that can significantly improve the energy efficiency of high energy-consuming buildings. The system is expected to be modular and easily replicable in other energy intensive centres.

The project will specifically demonstrate the energy networks management system in the current facilities of the University of Santiago de Compostela (USC) in its southern campus – Campus Sur. The campus buildings consume large amounts of energy - heat and electricity - which is supplied by three cogeneration plants on site.

The project will start by conducting energy audits in the campus buildings, covering:

- Electricity consumption;
- Thermal performance;
- Efficiency in the current occupation and use of the buildings; and
- Tests to better combine and streamline use of the existing energy sources.

On the basis of these results, it will draft an energy management plan targeting reduced consumption and more efficient use of the existing energy resources. It will also enable the adaptation and modulation of the energy

LIFE12 ENV/ES/001173
LIFE_OPERE



Beneficiary:

Type of beneficiary

University

Name of beneficiary

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Name of contact person

Juan Enrique ARIAS RODRIGUEZ

Duration of project:

42 months (01/07/2013 – 31/12/2016)

Total budget in euro:

1,190,479.00

EC contribution in euro with %:

566,739.00 (50.00 %)

Theme: Climate change – Energy: Energy supply

generation in the cogeneration plants to efficiently meet actual needs.

The plan will include monitoring systems and enable assessments of the economic advantages obtained. It thus hopes to demonstrate a reduced environmental and economic impact related to energy consumption in buildings that can be easily transferred and replicated.

Expected results

The project expects to achieve the following results:

- Demonstration of a modular and easily replicable energy networks management system;
- A 30% reduction in the university's energy consumption associated with thermal generation - equating to around 200 000 kWh/yr;
- A 35% reduction in CO₂ equivalent emissions – from electrical and thermal generation – equating to some 150 tonnes/yr of CO₂; and
- A 35% reduction in operating costs, saving the USC some 15 000 euros per year.

ReCOOL - Reuse of Anti-Freeze/ COOLants through Innovative Recycling Technology for LIFE+

Project background

Ethylene glycol is an organic compound with properties that make it useful for many industrial applications. Its low freezing point means it is used as an antifreeze in the automotive industries, whilst it is also an excellent heat transfer agent, for either cooling or heating systems. It is also used as a raw material in the production of polyester fibres and for soft drinks bottles.

However, ethylene glycol is toxic and harmful for the environment due to the presence of heavy metals, such as lead, cadmium and chromium. It is produced from ethylene gas, a by-product from natural gas and crude oil production processes.

Today, when the additives in the antifreeze/coolant lose their effect, the ethylene glycol stays intact but it is unsuitable for re-use without the rest of the additives, so it is considered waste. In the best cases, around one third of this waste is collected by a waste company and sent for incineration in power plants. The remaining 66% is discarded into sewers and drains, with very negative environmental impacts.

The beneficiary, Recyctec, has been working since 2008 to develop a technology for the recycling of glycol waste. It has successfully demonstrated some success in small-scale tests at laboratory level, reaching a high purity level for the recycled glycol.

Project objectives

The ReCOOL for LIFE+ project aims to demonstrate how large volumes of hazardous ethylene glycol waste can be recycled into near-virgin quality glycol. It thus aims to provide a valuable and useful recycled industrial product, thereby reducing the environmental impact of waste antifreeze and coolants, and also saving natural resources and providing economic benefits.

The project aims to develop a complete and fully functional pilot plant containing the ethylene glycol purification technology developed by the beneficiary at laboratory scale. This technology will purify glycol from waste by evaporating its water content at all stages of the process. It is based on an energy-efficient process using steam.

The project expects to achieve a near 100% removal of water by evaporation, producing almost pure glycol. Fur-

LIFE12 ENV/SE/000292
ReCOOL for LIFE+



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

Recyctec AB

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Name of contact person

Göran AHLQUIST

Duration of project:

36 months (01/07/2013 – 30/06/2016)

Total budget in euro:

1,481,850.00

EC contribution in euro with %:

616,050.00 (50.00 %)

Theme: Waste: Hazardous waste

thermore, it expects to show that it is possible to recycle the same glycol many times – potentially without limit – without significant deterioration in quality.

The project will test the up-scaled technology with an initial batch of 36 000 litres, before demonstrating the feasibility of full-scale recycling of 10 million litres of used coolant/antifreeze. It should, thus, prove to be a suitable model for full-scale recycling of ethylene glycol across Europe, with the potential to recycle over 270 million litres/year.

Expected results

- The world's first production of recycled glycol with at least 95% purity;
- Demonstrated potential for recycling the same material many times;
- Demonstrated technology for minimising the use of new resources – notably from crude oil; and
- A reduction in the importation of mono-ethylene glycol to Western Europe from the Middle East and Russia.

Dryer for energy recovery from sewage sludge and manure

Project background

Biomass waste such as sewage sludge and manure can be processed to extract energy and phosphates. The first stage is the production of biogas through processes of anaerobic digestion - the breakdown of organic matter in the absence of oxygen. This leaves a sludge which still contains up to 50% of the available energy.

This remaining energy can be extracted through incineration to produce both energy and an ash from which phosphates can be recovered. However, before incineration can take place, the sludge needs to be dried to reduce its high water content - 80-97%. Unfortunately, given current techniques, more energy needs to be consumed to dry the sludge than would be extracted through its incineration. A more efficient drying method could release the tremendous potential of biomass waste for energy recovery and phosphate recycling.

Project objectives

LIFE SludgeisBiofuel aims to demonstrate an energy-efficient method for drying waste biomass ready for incineration processes to recover energy and phosphates. It plans to develop a new application of an existing industrial drying process. It thus hopes to contribute to a greater valorisation of biomass, contribute to the EU's long-term goals around renewable energy and improve management of phosphates throughout their lifecycle.

The project is taking as its basis a process that has been effectively used to dry wood and peat for some 15 years. Developed by Skellefteå Kraft AB, this process will be reviewed and developed by the beneficiary to create a concept for industrial drying of biomass sludge.

The project will build a pilot plant for sewage, manure and digestion residues at Skellefteå's municipal sewage treatment plant. Here it will test the adapted drying technology and review, adapt and optimise the process. It hopes to reduce by one quarter the energy required for evaporating water off the residue.

The project thus hopes to show that the energy needed to dry the biomass is less than the energy that can be extracted from the dried biomass through incineration, thereby demonstrating the commercial feasibility of full-scale plants for drying biomass residues as part of a broader process of recovery of energy and phosphates. The positive energy balance should create the incentives

LIFE12 ENV/SE/000359
LIFE SludgeisBiofuel



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

Outotec (Sweden) AB

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Name of contact person

Robert JOHANSSON

Duration of project:

36 months (01/07/2013 - 30/06/2016)

Total budget in euro:

3,063,115.00

EC contribution in euro with %:

1,250,000.00 (40.81%)

Theme: Waste: Waste recycling

to make this a widespread practice, contributing to wider renewable energy goals.

Expected results

- Reduce the energy consumption for drying sewage sludge, manure and digestion residues from 800 to 200 kWh/tonne of (evaporated) water;
- Achieve 100% energy recovery from biogas - up from current rates of below 50%;
- Enable more energy to be generated from the biomass than is consumed in the treatment process - a positive energy balance;
- Demonstrate commercial feasibility of a full-scale process for energy recovery from biomass waste;
- Successfully extract phosphates from the ash produced by incineration of dry biomass for valorisation as fertiliser; and
- Reduce the amount of unvalorised biomass waste and associated risks of (nutrient) pollution of soils and waters.

Etanolix 2.0: Demonstrating Innovative Method for converting Industrial Waste to Ethanol in oil refinery for LIFE+

Project background

EU Member States have committed themselves to reducing greenhouse gas (GHG) emissions by 20%, increasing the share of renewables in the EU's energy mix to 20%, and improving energy efficiency by 20%, all by 2020. However, many renewable energy technologies need further development to bring down costs before they become commercially viable. The production of some potential long-term alternatives to fossil fuels, such as biofuels, have also been criticised for their poor overall environmental performance. Problems with biofuels stem from land-use changes to monoculture, which negatively affects biodiversity, and assessments that suggest they generate more GHG emissions over their life-cycle than they avoid.

Some sectors also present specific challenges in terms of switching to renewable energy sources. The EU transport sector stands out in particular, being the only major sector where emissions are still rising.

Project objectives

The project aims to demonstrate and promote the conversion of industrial food waste into ethanol for use as a renewable fuel in the transport sector. It thus hopes to provide a sustainable solution for the management of industrial food waste, while also contributing to reducing the EU's dependence on fossil fuels, thereby helping to reduce GHG emissions.

The project aims to demonstrate the first operational processing plant – at about 80% scale under real-life conditions – for the sustainable production of ethanol from organic waste, integrated with the production process of an oil refinery. This integration expects to take advantage of energy synergies between the two processes through the proximity principle – bioethanol production will harness heat from the refining processes and cooling from the refinery water supply facilities. This will improve the energy efficiency of the overall process and help ensure the economic feasibility of the technology.

The bioethanol produced in the pilot plant will be used as a bio-component, to be blended with fuels for use in vehicles. This will contribute to the development of the biofuels sector, increasing its economic and technical feasibility as an alternative to fossil fuels. Furthermore, the project will work to valorise residue from the etha-

LIFE12 ENV/SE/000529
Etanolix 2.0 for LIFE+



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Name of contact person

Linda Cecilia WERNER

Duration of project:

48 months (01/07/2013 – 01/07/2017)

Total budget in euro:

4,552,001.00

EC contribution in euro with %:

1,682,920.00 (50.00%)

Theme: Waste: Industrial waste

nol production process. The sludge by-product, made of non-fermentable solids and water, will be used as silage for animal feed, providing yet another economic and environmental benefit.

Expected results

- Demonstration of the first complete system for the production of bioethanol using industrial residues, integrated within an oil refinery;
- Processing of 15 000-21 000 t/year of food waste;
- 98-100% conversion efficiency when recycling and re-using industrial food waste;
- Production of 5000 m₃/year of ethanol for use in transport fuel;
- 90% CO₂ reduction from biofuel use compared to fossil fuels;
- Improved energy efficiency by harnessing 67 60 MWh/year from excess steam and 9 530 MWh/year from excess cooling water from the oil refinery; and
- Production of 25 000 t/year of silage for animal feed.

LIFE BIOGAS XPOSE - Maximized biogas potential from resource innovation in the Biogas Öst region

Project background

The EU has set ambitious goals to meet its climate change objectives, including a 20% reduction of greenhouse gas (GHG) emissions and a 20% share of energy from renewable sources by 2020.

Biogas is seen as a particularly important and useful area of investigation for achieving these goals. Sustainably-produced biogas can be used as vehicle fuel, replacing fossil fuels and substantially reducing CO₂ emissions. Furthermore, the very processes used to produce biogas from organic waste capture the natural emissions of methane (CH₄) and nitrous oxide (N₂O) from degeneration of organic materials. Finally, the by-product of biogas production - digestate - can be used as a bio-fertiliser, reducing the demand for chemical fertilisers.

Sweden's biogas development has been relatively successful, notably regarding the use of bio-methane (BM) as a vehicle fuel. However, BM production has not been able to match growing demand, reducing the likelihood of the market turning away from fossil-fuel alternatives on a long-term basis.

Project objectives

The LIFE BIOGAS XPOSE project aims to foster the development of BM as a viable alternative to fossil fuels. It will evaluate different forms of waste to identify the most efficient means for obtaining biogas. It thus aims to demonstrate how BM can substantially contribute to the 2020 targets of reduced GHG emissions, increase renewable fuels, energy efficiency and resource efficiency.

The project will work to maximise the extraction of biogas from already used waste streams by testing new technologies. Processes such as dry fermentation, methanation of syngas and small-scale upgrading will be tested as potential means for increasing BM production. In addition, new substrates – such as horse manure and sewage sludge – will be examined as potential sources for biogas extraction.

The project will address issues throughout the entire biogas cycle. These will include optimising systems of logistics for harnessing and valorising biomass, such as maximising the collection of regional waste resources. All actions will be implemented in the region of Öst, which will see its BM production increased and serve as a benchmark in this field for other regions in Europe.

LIFE12 ENV/SE/000683
LIFE BIOGAS XPOSE



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

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Name of contact person

Torbjörn ÅNGER

Duration of project:

60 months (01/07/2013 - 29/06/2018)

Total budget in euro:

8,308,568.00

EC contribution in euro with %:

1,600,000.00 (48.75 %)

Theme: Climate change – Energy: Energy supply

Expected results

The project expects Öst to become a showcase region of sustainable and maximised biogas production, achieving the following:

- A 1 000 Gwh increase in biogas production;
- 5% of the total regional vehicle fuel demand to be met by BM;
- A 400 000-tonne reduction in total CO₂ emissions by replacing fossil fuels in the transportation sector;
- A doubling of the amount of bio-waste collected in the region for BM production;
- Promotion of BM as a viable means of achieving EU and national environmental goals around renewable energy, resource efficiency and GHG emissions; and
- The establishment of at least five more production plants.

Strategies for Organic- and Low-input-farming to Mitigate and Adapt to Climate Change

Project background

Combating climate change is a key priority for: the EU, which has put in place specific targets for 2020 a 20% reduction in GHG emissions; 20% of energy from renewable sources; and a 20% increase in energy efficiency.

Agriculture is one of the most vulnerable sectors to the effects of climate change. However, it is also one of the main contributors to the problem: GHG emissions from agriculture accounted for 10.3 % of all GHG emissions in the EU in 2009.

Different agricultural practices and technologies have been developed to help mitigate GHG emissions. These include the improved management of arable and grazing land, and the restoration of degraded and cultivated organic soils. Whilst these approaches have shown some success, the overall impact is not sufficient and in some cases, measures undertaken can have adverse effects on other aspects of sustainability, such as biodiversity and food security.

Project objectives

The SOLMACC Life project aims to demonstrate a set of innovative, climate-friendly farm practices under experimental conditions. These practices will demonstrate benefits for climate change mitigation and adaptation, and coherence with other sustainability objectives. The project thus hopes to promote the wide adoption of more environmentally-friendly farming practices and inform the ongoing development of policy and debate around climate change and agriculture.

The project will demonstrate a set of four, innovative, climate-friendly farming practices: 1. Optimised on-farm nutrient recycling; 2. Optimised crop rotation with legume-grass leys; 3. Optimised tillage system; and 4. Agroforestry. These will be implemented on 12 organic farms in Sweden, Germany and Italy.

The project expects to show a reduction of around 15% in the carbon footprint of plant products and greater resilience to the consequences of climate change on the pilot farms. It also expects to show coherence with other sustainability objectives of the European Union, such as the control of soil erosion, biodiversity conservation and enhancement, and the efficient management of natural resources, such as water.

LIFE12 ENV/SE/000800
SOLMACC Life



Beneficiary:

Type of beneficiary

Professional organisation

Name of beneficiary

International Federation of Organic Agriculture Movements (IFOAM) - Regional EU Group

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Name of contact person

Maya HERNANDO CALVO

Duration of project:

60 months (01/08/2013 – 31/07/2018)

Total budget in euro:

2,140,121.00

EC contribution in euro with %:

1,070,060.00 (50.00 %)

Themes: Climate change – Energy: Adaptation to climate change - Reduction of greenhouse gases emissions / Industry-Production: Agriculture – Fisheries

By successfully demonstrating the technical and economic viability of the interventions, the project hopes to contribute to the mainstreaming of these, as yet, uncommon agricultural practices and, in turn, to the achievement of European environmental objectives.

Expected results

- The successful implementation of an innovative set of climate-friendly farm practices on 12 organic farms in Sweden, Germany and Italy;
- A 15% reduction in GHG emissions from agricultural activities;
- An improved capacity to adapt to the negative effects of climate change; and
- A richer debate on EU policy around climate change and agriculture.

Demonstration of separation and closed loop recycling of carpet waste into polymers for reuse in carpet production

Project background

The manufacturing of carpet is linear: virgin raw materials are used to make yarn, backing and other materials, which are then used to manufacture carpets. This process is not sustainable in the long run: it consumes large quantities of primary resources and adds considerably to waste sent to landfill. Europe discards annually approximately 1 600 kilotonnes of post-consumer carpet material. Some 60% of this material is sent to landfill, which is undesirable because the materials in carpets – especially nylon – are generally not biodegradable.

In 2009, DESSO established a take-back and recycling programme for used carpets in six EU countries. While the amount of carpet waste returned is steadily increasing, there are still some technical challenges in the separation of the waste material into reusable compounds.

Project objectives

The project will demonstrate the technical and economic feasibility of a separation line based on innovative shredding and cryogenic separation technology, capable of separating discarded carpet material into its primary resources, which can directly be used in the production of new carpets or for depolymerisation. The project expects to increase the purity of the final material from 85% to at least 97%. Since closed-loop carpet recycling is not possible without this process, this can be considered a breakthrough technology.

The project aims to:

- Develop a cradle-to-cradle manufacturing process for carpets;
- Produce recovered material of high quality, which is necessary for reuse in high-quality applications. For this, a sophisticated separation and purification line is required to ensure that the recovered materials, including polyamide (one of the main resources in carpet manufacturing), can be reused; and
- Recycle each output material as much as possible of into new high grade materials.

Expected results

The project will put in place a pilot separation and purification line with a capacity of 92 tonnes/yr carpet waste. The pilot installation will demonstrate the technical and economic feasibility of the separation of carpet waste, provide data on the separation of carpet waste into homogeneous polymers and be a basis for optimisation of

LIFE12 ENV/NL/000269
LIFE ClosedLoopCarpet



Beneficiary:

Type of beneficiary

Large enterprise

Name of beneficiary

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Name of contact person

Marco VAN BERGEN

Duration of project:

42 months (01/07/2013 – 31/12/2016)

Total budget in euro:

2,238,845.00

EC contribution in euro with %:

1,119,422.00 (50.00%)

Theme: Industry-Production: Plastic - Rubber -Tyre

the separation process. Following the demonstration, investment in two full-scale separation lines is foreseen, each with a capacity of approximately 4 100 t/yr carpet waste.

The pilot installation will process approximately 100 t carpet waste leading to the recovery and reuse of near pure streams of constituent materials (polyamide, polypropylene, PET, bitumen and other materials).

After upscaling, the overall expected benefits will include:

- Collection of 1% of the EU's carpet waste, i.e. 16 000 t/yr;
- Utilisation of 50% of this amount for material recycling, i.e. 8 000 t/yr, thereby diverting the same amount from landfill and also reducing the use of virgin materials by 8 000 t/yr;
- A reduction in energy consumption of 17.6 million kilowatt hours per year; and
- 8 500 t CO₂ equivalent emissions avoided per year.

Green plasma process technology for manufacturing of flexible electronics

Project background

The market for flexible electronic products is predicted to grow sharply. The manufacturing industry currently uses vacuum plasma deposition systems (vacuum PE-CVD) which have precursor-to-product ratio efficiencies of 20% at best. At least 80% of the raw materials leave the reaction chamber as exhaust or are deposited on reactor system components. As a consequence, the raw material waste stream of highly toxic precursor chemicals (aluminium oxide silane) is predicted to reach 12 000 tonnes by 2021. Moreover, the vacuum plasma process requires pumping systems and regular cleaning procedures to remove the depositions from reactor system components. Both aspects reduce the efficiency of vacuum PE-CVD in comparison with the new technology APG-CVD: atmospheric pressure glow plasma for chemical vapour deposition.

Project objectives

The main objective of this project is to demonstrate a new environmentally-friendly process technology for manufacturing flexible electronic components. This innovative technology platform has the potential to replace the traditional PE-CVD technology used for the deposition of thin functional coatings with electrical, optical, mechanical and moisture barrier properties. It is expected to lead to a reduction of raw material (precursor) usage and CO₂ emissions by more than 90%.

The specific project objectives include:

- Constructing an APG-CVD Process Demonstrator, as a moveable prototype system for on-site demonstrations of APG-CVD plasma process performance. It will demonstrate the quality of the product, robustness and process flexibility, efficiency of raw material use, safety and ease of operation, and the process's adaptability to specific customer requirements;
- Demonstrating the listed technical and environmental advantages of the APG-CVD plasma process for European industry active in the field of flexible electronics, through on-site demonstrations and comparison of the APG-CVD plasma process performance with the performance of traditional vacuum plasma systems;
- Quantifying environmental, technical and economic advantages of APG-CVD plasma technology through demonstration, product analysis and calculations based on specific customer situations;
- Scaling-up processes to a width of 120 cm in pilot plant process stability trials, leading to a robust process window setting; and

LIFE12 ENV/NL/000718

Life_Green_plasma



Beneficiary:

Type of beneficiary

International enterprise

Name of beneficiary

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Jan BOUWSTRA

Duration of project:

24 months (01/07/2013 – 01/07/2015)

Total budget in euro:

4,462,384.00

EC contribution in euro with %:

1,902,260.00 (49.90%)

Themes: Climate change – Energy: Reduction of greenhouse gases emissions / Industry-Production: Electric - Electronics - Optical

- Demonstrating large-scale manufacturing opportunities for different functional layer mixtures, varying aluminium oxide thickness (1-200 nm), composition (SiO_x, TiO_x, ZnO, SnO), porosity and surface hydrophobicity.

Expected results

The project's expected results include:

- Dissemination of the APG-CVD technology among Europe's photovoltaic and flexible electronic applications producers;
- A Demonstrator System of APG-CVD technology;
- The scaled-up process running at a pilot plant at a pre-manufacturing scale;
- Full product analysis benchmarked against thin layer deposited by PE-CVD; and
- Seven agreements for steps to substitute vacuum PE-CVD with APG-CVD.

Low Emission Asphalt Pavement

Project background

Road construction, maintenance and renovation (in particular, asphalt pavements for primary and secondary roads) have a huge environmental impact. Road and infrastructure construction consumes large quantities of raw materials. Raw materials needed for asphalt pavements consist of mineral elements such as stones, grit and sand (aggregates), filler and bitumen.

To produce one tonne of asphalt, approximately one tonne of natural resources, mainly aggregates, is needed. The demand for natural resources in road construction is enormous, and requires the transport of natural resources from mining areas to asphalt plants and road construction sites. As a result, such production is responsible for large amounts of hydrocarbon emissions. The most important sources of these emissions are the combustion of fuels and vapours from heated bitumen. Extra hydrocarbons are emitted during the heating of reclaimed asphalt.

At present, several innovations are taking place in different areas of the road construction sector: asphalt mixtures, construction techniques and the use of reclaimed materials. With regard to asphalt materials, for example, there are innovative developments in the areas of lower-temperature asphalt, low-traffic-noise asphalt and low-maintenance asphalt. However, the innovations occur on a product level. There is as yet no integration of the different innovations in order to realise optimal environmental performance of road (re)construction.

Project objectives

The main objective of this project is to demonstrate a convergence of cold asphalt technologies (a type of asphalt that retains its pliable properties when the temperature drops) and road construction technologies to significantly improve environmental performance of road construction and maintenance processes.

The project will demonstrate the following innovative asphalt technologies and paving techniques:

- Dry decomposition of reclaimed asphalt: milling and decomposing old asphalt layers with a cleaner dry process; and
- Production of a new and greener cold asphalt mix that contains at least 80% reclaimed asphalt and can be produced and used at 80°C.

LIFE12 ENV/NL/000739

Life+ LE2AP



Beneficiary:

Type of beneficiary

Development agency

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Name of contact person

Max VON DEVIVERE

Duration of project:

48 months (01/07/2013 – 30/06/2017)

Total budget in euro:

4,908,890.00

EC contribution in euro with %:

1,280,456.00 (48.99%)

Theme: Industry-Production: Building

Expected results

Construction of a 1 km road with over 80% of reclaimed materials. Using the cold asphalt and construction techniques developed by the project will lead to the following environmental improvements:

- An 80% reduction in hydrocarbons emissions;
- A 10% reduction in particulate matter (PM) emissions;
- A 50% reduction in NO_x emissions;
- A 35% reduction in CO and CO₂ emissions;
- An 80 reduction in odours;
- A 7dB reduction in rolling noise; and
- A 35% reduction in energy consumption.

Reversed Waste Collection

Project background

As the EU has become wealthier, it has produced more and more waste. Every year 3 billion tonnes of waste are disposed, of which 90 million tonnes are hazardous waste. Treating and disposing all this material, without causing environmental damage, poses a great challenge.

Currently, most waste is combusted in incinerators or processed in landfills (67%), resulting in air, water and soil pollution and the emission of greenhouse gases. Such waste not only contributes to climate change but it also represents a significant loss of raw materials.

According to the OECD, in 2020, 45% more waste will be produced in comparison with 1995 levels. To avoid this occurring, more efforts need to be made to reuse or recycle materials.

Project objectives

The main objective of the project is to demonstrate a new, more efficient and cost-effective waste collection system - reversed waste collection - in three different neighbourhoods of Arnhem. By offering a series of incentives to the local population, the reversed waste collection system is designed to encourage people to separate valuable household waste.

In order to recover more materials (resources), the service level for households in low-rise buildings will be increased. For inhabitants it will become easier to dispose of such resources (e.g. paper, plastics and organic kitchen and garden waste). These will be collected at their doorsteps. At the same time, large quantities of residual waste will be discouraged: waste has to be brought to an underground waste collection system.

The system will be implemented in three areas: a low-income neighbourhood, classified as an area to be developed by the Dutch government; a mixed neighbourhood with both low-rise and high-rise buildings; and a neighbourhood with only low-rise buildings.

Expected results

The project expects to implement an appropriate and effective reversed waste collection system in three different neighbourhoods of Arnhem, which will serve as a best practice example for other EU municipalities. This system will increase the amount of recycled resources in a cost-efficient way, achieving the following targets:

LIFE12 ENV/NL/000792
LIFE ReWaCo



Beneficiary:

Type of beneficiary

Local authority

Name of beneficiary

Gemeente Arnhem

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Name of contact person

Geert BOONZAAIJER

Duration of project:

37 months (01/07/2013 – 31/07/2016)

Total budget in euro:

2,173,617.00

EC contribution in euro with %:

775,383.00 (50.00%)

Theme: Waste: Municipal waste (including household and commercial)

- For low-rise habitations: collected waste to increase by the following amounts (kg/inhabitant/yr) within two years of implementation of the scheme: plastic (5.0 to 24.3); paper (42.8 to 75.8); organic waste (60.0 to 65.0);
- For low-rise habitations: residual waste to decrease from 247.0 to 176.7 kg/inhabitant/yr;
- For high-rise habitations: collected waste to increase by the following amounts (kg/inhabitant/yr) within two years of implementation of the scheme: plastic (5.0 to 7.0); paper (42.8 to 47.8); and
- A decrease in emissions of 1 500 tonnes CO₂/yr for an area with 20 000 inhabitants. The project will seek to develop improved systems for collecting waste in high-rise buildings in order to exceed this target.

ChildProtect-Life – Protecting Children’s Health from Endocrine Disrupting Chemicals

Project background

Endocrine disrupting chemicals (EDCs) can cause harmful health effects e.g. testicular, prostate and breast cancer and fertility problems. Yet they are found in many situations: Phthalates are used for floorings, toys, furniture and homeware. Brominated flame retardants used in curtains, upholstered furniture and mattresses are also likely to be endocrine disrupting. Bisphenol-A is used in plastics, papers and can linings, while parabens continue to be used in many cosmetics. Moreover, many pesticides and biocides contain EDCs and exposure occurs not only via food, but also via spraying in homes, gardens, playgrounds and public parks.

A number of environmental regulations include procedures for addressing EDCs. The main ones are the chemicals regulation, REACH, and the plant protection regulations. Many policy-makers, however, are not aware of EDCs and that existing EU regulations already contain procedures for addressing them in national legislation. Public authorities in charge of public health protection and food and product safety also need to be better informed about EDCs.

Project objectives

The project aims to speed-up implementation of EU environmental regulations with regard to the substitution of EDCs, in line with the EU 2020 goal of minimising adverse effects of chemicals on public health. The project seeks to develop innovative and multi-sectorial modular actions that speed-up policy measures and voluntary actions that protect children and pregnant women, in particular, from the harmful effects of EDCs. Such modules can then be replicated in other EU Member States.

Specific project objectives include:

- Providing information to policy-makers in order that they can proactively strengthen the implementation of EU chemicals and plant protection regulation, leading to a quicker replacement of products containing EDCs;
- Increasing voluntary substitution by the business sector of products containing EDCs, thus speeding up implementation of EU regulations;
- Increasing access to consumer information on EDCs in products in order to affect a change in consumption patterns and further acceptance for policy measures on EDC substitution; and
- Creating a ‘Health Sector Alliance’ that involves health

LIFE12 ENV/NL/000833
ChildProtect-Life



Beneficiary:
Type of beneficiary
NGO-Foundation

Name of beneficiary
Women in Europe for a Common Future

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Name of contact person
Sascha GABIZON

Duration of project:
30 months (01/07/2013 – 31/12/2015)

Total budget in euro:
701,068.00

EC contribution in euro with %:
349,184.00 (50.00%)

Themes: Information-Communication: Awareness raising – Information / Risk management: Human health protection

experts and health insurance companies with an interest in preventing health effects from EDC exposure.

Expected results

The project’s expected results will include:

- At least 200 policy-makers in the Netherlands, Flanders and Brussels will understand the need for (extended) requirements on EDCs and measures to speed-up implementation of EU chemicals and plant-protection regulations;
- Thirty key (national and EU) policy-makers from at least six different ministries will be involved in taking measures on EDCs;
- Ten NGOs will receive training and implement 10 actions;
- One thousand citizens and policy-makers will be actively involved and informed on EDCs; and
- At least 50 business/retailers will be informed about the benefits of voluntary substitution of EDCs in consumer products and encouraged to take action.

Demonstration of the next phase in shredder residue recycling: separating black plastics and minerals

Project background

Because of the multitude of different materials they are made from, end-of-life vehicles (ELVs) and electronic equipment (waste electrical and electronic equipment: WEEE) are especially hard to recycle. These two waste streams alone account for some 8 million tonnes of waste per year in Europe. Some ELV and WEEE components, such as glass and metal parts, can be recycled fairly easily. A recycling percentage of 80% can therefore be easily obtained. The challenge lies in the recycling or reuse of the remaining 20%, which is mostly automotive or WEEE shredder residue (SR), consisting of plastic, rubber and other substances. Recycling of SR is not common practice, for the following reasons:

- Lack of value of SR, and the low cost of landfilling of certain waste streams; and
- Lack of proper recycling facilities to handle the additional separation of the waste.

Notwithstanding these problems, EU legislation requires 95% of the ELV waste stream to be recycled by 2015. To further recycle SR, which is currently regarded as valueless waste, and to approach the 95% level, new technologies and processes are required.

Project objectives

The project will demonstrate an integrated recycling solution for automotive and WEEE shredder residue. Using an innovative separation process, this solution is able to separate and increase the recycling efficiency of SR waste streams to 97%, thus surpassing the 95% objective fixed by the European Union's ELV legislation. The process will be demonstrated in a first full-scale application.

The beneficiary will establish and demonstrate additional separation steps to recycle minerals and black plastics from SR. Finally, the organic residues resulting from this process will be used to make energy pellets. Once the integrated recycling solution has been implemented and demonstrated, the project will assess its cost-effectiveness, technical feasibility, and the environmental benefits that might derive from it.

Expected results

The project expects to achieve the following results:

- A fully constructed and tested automotive and WEEE SR waste recycling plant with a recycling efficiency of 97% and an eventual capacity of 150 000 tonnes/yr;

LIFE12 ENV/NL/000980
SRNEXT_4_LIFE



Beneficiary:

Type of beneficiary

Small and medium-sized enterprise

Name of beneficiary

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Name of contact person

Rene VASTERT

Duration of project:

30 months (01/07/2013 – 30/06/2016)

Total budget in euro:

2,131,278.00

EC contribution in euro with %:

826,371.00 (38.77%)

Themes: Industry-Production: Electric - Electronics - Optical / Waste: End-of-Life Vehicles (ELV's) and tyres - Waste from Electrical and Electronic Equipment (WEEE)

- Demonstration that the plant is capable of separating and recovering metals, non-ferrous material, non-recyclable plastics, wood and currently valueless waste streams such as black plastics, minerals and compressed fibres; and
- Fabrication of energy pellets from the organic residues.

NaturEtrade: creating a marketplace for ecosystem services

Project background

The value of ecosystems to humans and the wider environment has been given the name, 'ecosystem service'. For example, the role that forests and peatlands play in regulating and absorbing atmospheric CO₂ is an ecosystem service. EU environmental policies to address the wider issue of land-use change are increasingly focused on ecosystem services and in developing financial incentives for conservation. This would effectively make ecosystem services a tradable commodity.

Project objectives

The LIFENaturEtrade project aims to create a novel suite of easy-to-use tools and mechanisms to identify, map and create a marketplace for ecosystem services in Europe. It thus hopes to demonstrate a successful approach for enabling EU landowners to quickly assess the ecological potential of their land and then to trade the associated ecosystem services.

The project aims to use existing research outputs to develop an automated web-based tool that can upload information on land parcels and determine their ecological potential, based on the following ecological services: i) pollination; ii) clean water provision; iii) soil erosion protection; iv) carbon storage; and v) cultural services. The easy-to-use tools and technologies will automatically generate landscape-scale maps, indicating the key ecosystem services and their spatial configuration.

The project will also establish a web-based trading platform - 'NaturEtrade'. This will provide a structure through which parcels of land, and the ecosystem services they provide can be safely and securely traded. Marketing and awareness-raising will be undertaken to promote the use of this novel mechanism and the delivery of private and public-sector investment in the ecosystem services provided by EU land.

LIFENaturEtrade will conduct a study of land-use change before and after the introduction of these tools and technologies in four case-study regions in the UK, Romania, Croatia and Spain. It will examine satellite imagery of parcels of land every three months in order to show the impact of the project in helping to reduce the loss of ecologically diverse land in Europe.

The development of an ecosystem services market place ultimately aims to enhance the provision of environmental public goods. It will also contribute to the achieve-

LIFE12 ENV/UK/000473
LIFENaturEtrade



Beneficiary:

Type of beneficiary

University

Name of beneficiary

The Chancellor, Masters and Scholars of the University of Oxford

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Name of contact person

Katherine WILLIS

Duration of project:

60 months (01/07/2013 - 29/06/2018)

Total budget in euro:

1,829,416.00

EC contribution in euro with %:

914,708.00 (50.00 %)

Theme: Land-use and Planning: Spatial planning

ment of a number of EU strategic objectives, including those relating to a resource-efficient economy; climate resilience, a low-carbon economy; innovation for green infrastructure; and the creation of business opportunities, especially in the green economy.

Expected results

- Tools to enable landowners to easily assess the ecosystem service potential of their land;
- Collection of data on the ecosystem services provided by important blocks of land in Europe – including forests and peatlands – to support climate change mitigation;
- A web-based ecosystem services trading platform;
- Demonstrable uptake of both the assessment tool and the trading platform – by both buyers and sellers;
- A quantified reduction in the loss of biodiverse land in the case study regions; and
- A database of landowners and businesses with an active interest in and understanding of biodiversity conservation through ecosystem-service trading.

CollabOrAtive Local Engagement Strategies for our Climate

Project background

The risks to Europe from climate change are widely recognised, with impacts expected on the economy, infrastructure, health and the environment. Work is already underway at EU and national level to prepare for these impacts, notably through EU and national adaptation strategies, as well as the Europe 2020 strategy and associated environmental targets. However, there is still a significant gap between these policies and action on the ground.

A key issue is to promote adaptation at the local level that is undertaken: a) in a way that is consistent with national adaptation strategies; b) based on evidence derived from EU and national projects; c) at the right time and to a high quality; d) by the most appropriate organisations; and e) taking into account the interdependences between stakeholders and sectors. Without these elements, it is unlikely that adaptation will be effective or appropriate.

Project objectives

The LIFE CoaLESCe project aims to develop an innovative and replicable model for the process of building capacity for climate change adaptation at local level across Europe. It will focus on stakeholder engagement and knowledge transfer, targeting key local stakeholders - most notably local authorities and SMEs.

The project will undertake some key preparatory actions, which will deliver: a SWOT analysis of the project methodology; a scoping report on the impact of local-level interventions on the UK national adaptation plan (UKNAP); a stakeholder map and contact database of local and national adaptation stakeholders for each UKNAP theme; and a robust monitoring framework.

The main objective of the project is to create a network of local and national knowledge-transfer hubs, based on the "hub-and-spoke" model. To test the model, the project will implement sector-specific pilots, engaging local stakeholders on UKNAP priority themes and the interdependencies between them. It hopes to show that the knowledge-exchange model has the ability to support the transfer of knowledge between levels and across sectors.

The monitoring framework established in the preparatory phase will be used to assess the effectiveness of

LIFE12 ENV/UK/000542
LIFE CoaLESCe



Beneficiary:

Type of beneficiary

Development agency

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Duration of project:

40 months (02/09/2013 – 30/12/2016)

Total budget in euro:

6,428,976.00

EC contribution in euro with %:

3,214,488.00 (50.00 %)

Theme: Climate change – Energy: Adaptation to climate change

the pilot projects and knowledge-transfer activities on local adaptive capacity. It hopes to demonstrate the stimulation of local adaptive capacity in a manner that is coherent with the national adaptation programme. Dissemination of the results will enable other Member States to replicate the CoaLESCe model, and will also inform developing EU adaptation policy.

Expected results

- Establishment and operation of one national and nine local knowledge transfer and exchange hubs;
- Delivery of nine thematically based pilot approaches to building local adaptive capacity;
- Demonstration of the successful augmentation of local adaptive capacity within the framework of a national adaptation programme;
- Successful implementation of an Adaptive Capacity Monitoring Framework to monitor the project's impact; and
- An adaptive capacity report and recommendations.

Developing Resource Efficient Business Models

Project background

Domestic material consumption (DMC) in the EU reached 8.2 billion tonnes in 2007, 13% of all materials extracted globally. The annual average per capita material consumption in the EU was some 65% above the global average. The supply of stable, secure resources, however, is now constrained, while the global population continues to grow and the 'middle class', with increased levels of consumption, expands rapidly.

Many businesses are not fully aware of the potential risks or advantages of this increasing scarcity of natural resources. Although the economic and environmental benefits of implementing circular business models are known, many businesses are locked in to the existing 'take, make, use, dispose' linear business models. This is particularly true for SMEs. Business leaders face very significant barriers to adopting new business models or in making significant organisational changes to tackle resource efficiency.

Resource efficient business models (REBMs), however, can make a major contribution towards the EU's target of reducing domestic material use by 30% by 2020 and greenhouse gas emissions by 20%.

Project objectives

The LIFE REBus project will demonstrate how businesses and their supply chains can implement REBMs. It will focus on four key markets: electrical and electronic products; clothing; furniture; and construction products. These have a total annual value of more than €350 billion across the EU.

The project aims to:

- Implement 10 pilot REBMs in major organisations and 20 in SMEs with the aim of achieving 15% resource savings in the project lifetime;
- Measure and monitor the impact of each REBM pilot against the targets highlighted above to calculate its potential impact across the EU;
- Identify requirements for applying REBMs in public procurement by stimulating the demand side in order to motivate the production of resource-efficient products;
- Raise awareness of the outcomes amongst peer groups to promote a wider take-up; and
- Work with key organisations focused on this area to develop and disseminate information from the project across the EU.

LIFE12 ENV/UK/000608
LIFE REBus



Beneficiary:

Type of beneficiary

NGO-Foundation

Name of beneficiary

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Duration of project:

42 months (01/07/2013 – 30/12/2016)

Total budget in euro:

3,104,725.00

EC contribution in euro with %:

1,552,361.00 (50.00 %)

Theme: Environmental management: Eco-products design

Expected results

The 10 large and 20 small projects are expected to deliver the following cumulative benefits per annum:

- 5 000 tonnes direct material savings;
- 20 000 tonnes of GHG emissions savings; and
- Financial benefits of €12 million.

LIFE ObservaTREE - an integrated early warning system for tree pests and diseases using citizen science

Project background

Preserving tree health is vital to human health and the natural environment. It is also fundamental to combating climate change. However, trees in all situations are increasingly affected by health threats, with research showing across-the-board increases in damaging fungal infections. Around 11 million ha of EU forests (6%) are affected by forest damage, including many new pests and pathogens that have been introduced since 1900.

Project objectives

The LIFE ObservaTREE project aims to demonstrate an effective Tree Health Early Warning System (THEWS), based on public engagement. It seeks to mobilise the expertise and resources of landowners, industry, academia and governments to identify any significant impacts from new introductions of plants or trees. The system expects to enable early intervention to contain or eradicate identified pests, in a way that implies fewer environmental, landscape and economic costs.

The project will create a cadre of engaged, knowledgeable Tree Health Champion volunteers, by training citizens - as well as volunteers from within the forestry, horticultural and arboriculture sectors - to assist with the identification and verification of tree health incidents. In this way, the project aims to generate a tenfold increase in Tree Health Incident Reports, as well as a more general increase in bio-security awareness amongst citizens and civil society.

It will work to ensure that all tree health information is readily available at national level through a central web portal that incorporates the latest research findings, and links with EU information. It will produce a single, transparent and unambiguous database of Tree Health Incident Reports, based on a bespoke online reporting and verification system. It will also create and maintain a prioritised list of tree health risks, acknowledging likely climate change impacts.

To ensure the efficiency and effectiveness of the system, the project will employ dedicated NGO 'Engagement Coordinators' to filter all the expected incident reports on behalf of the public authorities. This will enable public sector diagnosticians to focus their attention and resources on the reports of greatest significance. The project thus targets the delivery of a coherent and integrated early warning system that avoids the prolifera-

LIFE12 ENV/UK/000731
LIFE ObservaTREE



Beneficiary:

Type of beneficiary

Research institution

Name of beneficiary

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Duration of project:

48 months (01/10/2013 – 01/10/2017)

Total budget in euro:

2,193,909.00

EC contribution in euro with %:

1,096,693.00 (50.00%)

Themes: Information-Communication: Public and Stakeholders participation / Land-use and Planning: Forest management

tion of different approaches across the country, enabling cheaper and more successful UK eradication or containment efforts, and a greater exchange of knowledge across Europe.

Expected results

- Demonstrating a 'best in Europe' Tree Health Early Warning System (THEWS);
- At least 100 Tree Health Champions trained;
- A tenfold increase in Tree Health Incident Reports – from around 5 000 people;
- A central information portal containing a central database of 10 000 Incident Reports and an 'Information Library' of critical UK tree health risks;
- Identification of damaging tree pests and pathogens at an earlier stage; and
- Practical multi-stakeholder and cross-border collaboration in England, Scotland, Wales and Northern Ireland.

Circular Economy Metrics

Project background

Throughout its evolution and diversification, our industrial economy has hardly moved beyond one fundamental characteristic: a linear model of resource consumption that follows a 'take-make-dispose' approach. Companies harvest and extract materials, use them to manufacture a product, and sell the product to a consumer, who then discards it when it no longer serves its purpose. For most materials, the rates of conventional recovery after the end of their first-functional life are quite low, when compared with primary manufacturing rates.

Project objectives

The LIFE+ CEMs project aims to demonstrate that the concept of a circular economy offers a practical alternative to the traditional waste-generating, resource-inefficient linear approach. Specifically, it seeks to design and develop a web-based tool to enable European businesses to measure their effectiveness in moving towards the circular economy. It thus hopes to encourage a shift to a circular approach.

Key aims of the project are to develop metrics for measuring the circularity of both companies and individual products. For example, this might be a performance score out of 100, based on aspects such as the need for new raw materials, the generation of waste, etc.

The project will create an online tool that companies can use to calculate the metric for a product. Although it is not planned to be able to develop a similar tool for the company-level metric at this stage, the project team will start to investigate what would be required to deliver such a tool in the future.

To demonstrate that the product-assessment tool and related metrics can deliver real performance improvements in practice, the project will work with participating companies to test their implementation. They will work to identify actual and projected environmental and economic performance improvements through a set of key performance indicators such as savings in waste, energy and cost. They will also look to develop a good understanding of how the metrics could be applied in other fields and how they can be used to inform future policy-making.

Expected results

- A tried and tested generic methodology for measuring how well a product performs within the context of the circular economy;

LIFE12 ENV/UK/000966
LIFE+ CEMs



Beneficiary:

Type of beneficiary

NGO-Foundation

Name of beneficiary

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Duration of project:

24 months (01/07/2013 – 30/06/2015)

Total budget in euro:

381,780.00

EC contribution in euro with %:

190,889.00 (50.00%)

Theme: Environmental management: Integrated management

- A tried and tested generic methodology for measuring how well a company performs within the context of the circular economy;
- An open source, unrestricted publication of the two methodologies;
- A tried and tested online tool for calculating the product-level circulatory metric;
- The technical scoping of an online tool for calculating the company-level circulatory metric; and
- A completed quantitative assessment of the environmental and economic benefits that could accrue from a large-scale adoption of the metrics.

Climate-proofing Social Housing Landscapes

Project background

Urban environments, with their high population densities, industries and infrastructure, are likely to suffer the most severe impacts of climate change. The anticipated increased pressure on hydrological processes and the growing prevalence of the urban “heat island” effect, especially during summer months, will cause significant additional stresses in urban areas. Threats include increases in flooding, pressure on sewer systems, diffuse water pollution and heat stress.

Project objectives

The project aims to develop climate change adaptation solutions for existing social housing landscapes. It specifically hopes to demonstrate a holistic package of measures, based around the retrofitting of blue and green infrastructure, and increased local stakeholder engagement. Ultimately, it hopes to demonstrate an integrated approach to addressing climate-related and wider socio-economic challenges in vulnerable urban environments.

The project will retrofit green and blue infrastructure covering the whole housing management cycle, such as Sustainable Urban Drainage Systems (SUDS), rain gardens, drought-resilient planting and micro green roofs supported by rainwater harvesting. This will provide effective, affordable and socially acceptable alternatives to heavy engineering approaches and achieve environmental and economic goals, such as reducing freshwater demand.

The project will implement the new measures in three selected sites that will reflect different social housing contexts, such as different property types and estate sizes. However, they will all be in areas characterised by high levels of multiple deprivation, including poor quality environments and consequently higher exposure to climate-related risks.

It is targeting in-depth community engagement and awareness-raising of climate change adaptation opportunities. This aims to result in local residents’ buy-in to the measures, and their involvement, wherever possible, in long-term maintenance activities.

Another aim is to demonstrate different mechanisms for resourcing the delivery of adaptation measures that can achieve multiple objectives for local communities. This is expected to include combining implementation with employment and accredited training programmes for long-term unemployed people, thereby creating local jobs.

LIFE12 ENV/UK/001133
LIFE Housing Landscapes



Beneficiary:

Type of beneficiary

NGO-Foundation

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Duration of project:

33 months (01/07/2013 – 31/03/2016)

Total budget in euro:

1,615,636.00

EC contribution in euro with %:

807,818.00 (50.00 %)

Theme: Climate change – Energy: Adaptation to climate change

Expected results

Among the expected results are:

- A transferable methodology for designing affordable, light-engineering climate change adaptation measures for social housing landscapes using green and blue infrastructure;
- A transferable methodology for resident stakeholder engagement, resulting in site-specific community adaptation action plans and practical involvement in retrofitting and maintenance activities;
- The use of employment programmes to engage local, long-term unemployed people in the implementation of project measures; and
- A set of training modules for housing and grounds maintenance professionals on the whole cycle of adaptation and green infrastructure.

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Luxembourg: Publications Office of the European Union, 2013

LIFE Publication / Environment Policy & Governance – Projects 2012

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ISBN 978-92-79-29479-2

ISSN 1977-2319

doi:10.2779/15028

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