



LIFE III

Environment



Best LIFE-Environment Projects 2005-2006



European Commission



European Commission Environment Directorate-General

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*Representatives of LIFE national authorities
from EU Member States at the Malmö meeting
in Sweden, April 2005*

This is the second review of completed projects funded through the EU's LIFE-Environment demonstration programme. The objective was to find out which projects were the 'Best of the Best' (BoBs) of those projects that completed their final reports before January 2006. This year, following an initial review carried out by the LIFE Unit's external monitoring team, Member States reviewed the top 21 of the 62 projects that finished within the reference period.

We used the same criteria as for the 2005 selection i.e., the LIFE national authorities used a set of criteria, agreed upon at a meeting in the city of Malmö in Sweden (on 27-28 April 2005) to identify the best projects from an initial list prepared by the external monitors. However, this year there were a few modifications made in response to comments by Member States last year. The projects were distributed among evaluators on a random basis in a workable language for the national authority and with only one review from the Member States where the project beneficiary was based.

Overall, the process ran much more smoothly than the first year's selection process with colleagues responding promptly to my many requests and queries. The results were encouraging: no projects were considered "below average" and although only five projects could be included in the final, 'Best of the Best' (BoBs) selection, the margin separating fifth place from eighth, was only 1.5%, which indicates just how close the decision was. I was also pleased to note that project managers are increasingly aware of the 'BoBs'.

We should not forget that the purpose of the evaluation exercise is to raise the profile of the work done through the LIFE-Environment programme and help ensure that policy officers and SMEs are aware of important results which could enhance their activities and benefit Europe's environment. With the selection and management of projects in the new LIFE+ Programme (2007-2013) likely to be moving from the Commission to Member States, I hope that the 'BoBs' can find a new role bringing together the outputs from national programmes, and identifying and rewarding projects, whose results are exceptionally significant at EU level.

For me this was also a sad occasion, as this was my last year coordinating the final selection process (I have moved to a new post within Defra – the Department for Environment, Food and Rural Affairs). From next year, the 'BoBs' will be coordinated by Nicole Kerkhoff of SenterNovem, an agency of the Netherlands Ministry of Economics Affairs, to whom I offer my best wishes.

I would like to express my gratitude to all my national authority colleagues who gave up valuable time. A special thank you goes to: Isabelle Lico, Eleni Stylianopoulou, Ralf Tegeler, Gabriella Camarsa and Pascal Magoarou. Thanks also to the staff from the LIFE Unit, the external monitors and to all the project beneficiaries.

Robbie Craig
UK LIFE Committee Member



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✳ "Best of the Best" projects

Introduction

EU Member States represented on the LIFE Committee and the European Commission's LIFE Unit have announced the Best LIFE-Environment Projects 2005-2006. The results of the selection (approved by the LIFE Committee on 15 May 2006), are the 21 projects featured in this publication. These projects represent the most successful of the recently completed LIFE-Environment projects in terms of their contribution to immediate and long-term environmental, economic and social improvements; their degree of innovation and transferability; their relevance to policy and their cost-effectiveness.

The 21 best LIFE-Environment projects 2005-2006

Land-use development and planning

SINESBIOAR	Portugal
AIRforALL	Romania
MicoValdorba	Spain
Ythan Project	United Kingdom
EcoMonte	Austria
ECOREG	Finland
CER-COM+	Italy

Water management

★ Dairy, no water	The Netherlands
ANPHOS	The Netherlands
Bothnian Bay	Finland

Impact of economic activities

★ RefinARS	Italy
★ DETECTIVE	The Netherlands
★ OSIS	Denmark
Stiim	Sweden

Waste management

★ PAROC-WIM	Finland
GENPLAST	Spain
REUSEOIL	Sweden
ENVACTCRB	Romania

Integrated Product Policy

ECON-tainer	The Netherlands
CLEAN DECO	Italy
GPPnet	Italy

★ "Best of the Best" projects

This, the second Best LIFE-Environment Projects' exercise, follows on from a lengthy identification and evaluation process based on a set of best practice criteria, developed by EU Member States in collaboration with the European Commission. The projects, from across the EU-25, cover all of LIFE-

Environment's main themes: land-use development and planning; water management; minimising the impact of economic activities; waste management, and Integrated Product Policy.

The objective of the exercise is to help improve the dissemination of LIFE project results by clearly identifying those projects whose results, if widely applied, could have the most positive impact on the environment.

Commenting on the results of this year's selection process, LIFE Committee Member Robbie Craig (Department for Environment, Food and Rural Affairs, UK) said: "We offer our heartiest congratulations to all the projects that were selected. We offer particular congratulations to the five selected 'Best of the Best' (BoBs), who, in the opinion of the LIFE Committee, represented the very best of this list."

He noted that once again there was a "very strong emphasis on eco-innovation" among the short-listed projects: "Word about these awards is beginning to spread. Throughout the EU, it seems beneficiaries of projects that are just about to close are asking for more information about the criteria for selection."

How were the best projects selected?

Scoring of completed LIFE-Environment projects began in the summer of

2004. The system was introduced by the Commission, following an initiative taken by Sweden and the Netherlands. After a meeting at The Hague on 11-12 May 2004, a set of 'best practice' criteria was developed in collaboration with the Member States. These criteria included: projects' contribution to immediate and long-term environmental, economic and social improvements; their degree of innovation and transferability; their relevance to policy and their cost-effectiveness. In view of the importance of these aspects to project success, project beneficiaries are also required to provide an After-LIFE Communication Plan and an Analysis of the long-term benefits of the project with their final report. This information forms an integral part of the evaluation process.

All completed projects are initially technically assessed by the LIFE Unit's external monitoring team (the Astrale consortium). The monitors ranked all the projects that ended during the reference period (autumn 2005 to spring 2006), to produce a first list. The final selection was undertaken by the Member States under the coordination of Mr. Craig, using the agreed criteria.

This publication presents the 21 best LIFE Environment projects 2005-2006, including the five Best of the Best projects selected by the LIFE Committee. It includes the beneficiaries' contact details and website addresses.



Land-use development and planning

The Commission's new Thematic Strategy on the Urban Environment calls for an integrated approach to environmental management, land-use and transport planning at the local and regional level. To be sustainable, land-use planning and development must harmonise a wide array of cross-cutting aims, ranging from water, air and soil protection to the promotion of economic development; from the conservation of natural habitats to the fulfillment of transport needs; and from managing local climate-protection measures to reducing social segregation. Entailing partly contradictory objectives, land-use planning processes are often conflict-ridden. Sustainable land-use therefore requires integrated approaches, which take into account the economic and social, as well as environmental concerns of the numerous different stakeholders involved.

Thematic Strategy on Urban Environment (adopted on 11 January 2006).
http://ec.europa.eu/environment/urban/thematic_strategy.htm

SINESBIOAR: Sustainable development of the Sines region, Portugal

The SINESBIOAR project implemented a multidisciplinary tool to manage air pollution and the impact of social pressures on an industrial area of the Portuguese south coast.



Beaches on the nearby coast provide an excellent opening for eco-tourism.

Identifying and evaluating an area's air pollutants is an important step towards managing the quality of air. Industrial activity in the Sines region of the Alentejo is located in clusters, and as a result it is difficult to determine the exact source of air pollution.

The project was set up to enable the Commission for Regional Coordination and Development of the Alentejo region (CCDR-Alentejo) to better evaluate the air quality of the Sines region. It provides a wide range of environmental data that allows the CCDR-Alentejo to implement a programme of sustainable industrial development and environmental management.

Since the 1960s the Sines area of the Alentejo has been a centre for industrial development. An industrial harbour was built, and the area attracted many companies related to the petrochemical and energy sectors. These industries have contributed to air pollution, however,

emitting sulphur dioxide, nitrous oxide and volatile organic compounds into the atmosphere.

The LIFE-supported project was set up in response to local demand for an improvement in air quality and the opportunity presented by the surrounding parks and coastal areas for eco-tourism. It recognised the urgent need for a monitoring tool that would take various types of data, such as emissions, traditional air-quality indicators, bio-indicators and information about land-use and climate, and provide the local authority with useful guidelines for sustainable development and land use.

The end result was a web-based system that provides relevant and up-to-date information to the public, industry and managers. The CCDR-Alentejo is responsible for keeping the system up and running, and monitoring facilities are a permanent fixture of the area.

A broad approach

Organisers attribute a good deal of the success of the project to the involvement of private companies, public bodies and research institutes. The project was supported by the Instituto Superior Tecnico (the largest Portuguese engineering faculty), the Lisbon University Foundation, and the ISCTE (Higher Institute of Business and Labour Sciences) as well as the

main companies in the area, Petrogal, Borealis, CPPE, Tránsagas, Atlântico e administração do Porto de Sines.

Another key to the project's success was its multidisciplinary approach: lichens that can accumulate several pollutants were used as bio-monitors, social problems were monitored and geostatistical models of pollutant dispersion were developed. This approach resulted in reliable and detailed monitoring and management of air quality.

The project has a positive legacy: trained personnel continue the monitoring work, and an active website and ongoing newspaper slot are part of the project's aim to address public concerns and include the local population in sustainable land use.

Project Number:

LIFE00 ENV/P/000830

Title: Implementation of a multidisciplinary tool for the evaluation... of air quality.

Beneficiary:

CCDR Alentejo, Portugal

Total Budget: €1,282,000

LIFE Contribution: €622,000

Period: 01-Dec-2001 to 30-Nov-2004

Website: www.ccdr-a.gov.pt/

Contact: Maria Augusta Machado Martins Campos

Email: maria.campos@ccdr-a.gov.pt



AIRforALL: Forecasting extreme levels of local ambient pollution

An early-warning system in the Romanian city of Baia Mare integrates meteorological and pollution data to predict extreme local contamination levels, thereby enabling authorities and polluters to inform citizens and take preventive measures.

Due to its topography and the presence of two large smelting facilities, the City of Baia Mare suffers from high levels of pollution from toxic substances such as sulphur dioxide and lead powders. The county of Maramures, in which Baia Mare is located, is one of the country's 20 most polluted areas (also known as "hot-spots"). Here the mortality caused by air-pollution related diseases is 15% higher than the national urban average.

Local weather conditions further increase the risk of incidences of high concentrations of pollutants that accumulate just above the ground level. The National Administration of Meteorology (NAM) is legally responsible for issuing warnings about adverse weather and ambient pollution. At the start of the project, however, air-quality forecasting was not

technically available in Romania, and the NAM had no method of predicting when and where exceptionally high levels of air pollution would occur.

The aim of the AIRforALL project was to develop a computerised system to forecast air-quality status in Baia Mare urban area and other neighbouring zones 24 to 48 hours in advance. Based on this warning, the local authorities, the polluters and the population can react to prevent the occurrence of high levels of pollutants and avoid high-risk areas.

The project created a scientific discussion ground for the central authorities, local authorities and the polluters, to jointly act to avoid increased air contamination.

Precisely predicting pollution

The project succeeded in developing a system which, based on remotely processed local meteorological and air-pollution data, is able to forecast ambient air-quality with a high degree of accuracy 24 hours in advance of the expected adverse event. One of the project's principal success factors was its close cooperation with a previous LIFE project, 'ASSURE' (LIFE99 ENV/RO/006746), which developed a Geographical Information System (GIS)-based land-use planning system to assess and forecast the environmental impact of anthropogenic activities.

The success of the pollution-forecasting system has encouraged further cooperation between local agencies responsible for environmental protection and other technical institutions, with a view to providing polluters with a sound scientific basis for steering their technologies in order to minimise the risk of excess pollution. The GIS-supported system is also a valuable instrument for developing zoning policies and industry plans, and the NAM is currently implementing a further LIFE project, 'AIR-AWARE' (LIFE05 ENV/RO/000106), which seeks to assist spatial planning, traffic management and pollution control in the Bucharest metropolitan area.

With the early-warning system operational, and its application in other high-risk areas probable, the most important long-term criteria for the scheme's success will be the number of pollution alerts that are reacted upon by industrial plants responsible for the emissions.

The forecasting system remotely processes local meteorological and air pollution data.

Project Number:

LIFE00 ENV/RO/000987

Title:

Air quality forecast and alarming system on pollution levels

Beneficiary:

National Administration of Meteorology, Romania

Total Budget:

€462,000

LIFE Contribution:

€201,000

Period:

01-Nov-2001 to 30-Apr-2005

Website:

<http://life-airforall.inmh.ro>

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MicoValdora: Sustainable management of wild fungus-producing forest ecosystems

Lack of control of mushroom picking is threatening the biodiversity of mushroom-producing areas in the Navarra region of Spain. A LIFE co-funded project to establish an integrated management system for the region has generated economic and social benefits.

Mushroom collection and cultivation provides great potential for rural economic development in the Valdorba region of Navarra. While most woodland mushroom areas are owned by local authorities and managed by the Navarra Regional Government, mushroom production and collection is generally not controlled. Lack of management often leads to conflicts between the landowners and mushroom collectors. Unsustainable picking practises threaten mushroom populations, soil fertility, plant development as well as the overall equilibrium of the natural ecosystems – mostly meadows, woodlands and traditionally cultivated land.

The project beneficiary, the city council of Leoz, one of seven municipalities comprising the Valdora region, set out to establish an integrated management system for mushroom-producing ecosystems. The aim was to ensure the conservation and enhancement of the ecosystem's biodiversity, while generating social and economic benefits for the region's rural population.

At the heart of the innovative project was the application of forestry practises and land management methods that combine sustainable management of mycological resources with rural economical development. The project developed tools aimed at integrating mycological resource management

concerns into official land-use policies and natural resources planning systems at local and county level.

Wide-ranging results

In total, 72 hectares of woodland were managed using forestry practises based on sustainable mycological resources management, and 17 ha of land were reforested with mycorrhized trees. The technical team employed for the LIFE project is now considered a specialist reference unit for mushroom-related project development. The team is regularly requested to provide support and advice to others.

The project produced manuals and guidelines for sustainable management tools and methodologies, such as innovative mycological management plans, technical plans and forestry programmes. Guidelines were established for the ecological labelling of truffle and mushroom production at European level.

A high level of media coverage was also achieved at local, regional and national levels. Numerous events were organised, including conferences, nine technical courses, tree-planting days and even cookery lessons. Around 250 landowners participated through seminars, courses and visits. Though not originally foreseen, an annual truffle fair was established, further spreading the project's results.

A tourism-based model for the sustainable use of mushrooms led to the creation of six routes for mushroom collecting and eco-tourism. The model combined accommodation, gastronomic offers focusing on mushrooms, courses and guided walks. The project contributed directly to an estimated 30% increase in the area's hotel occupancy. The region's mushrooms and truffles attract about 500 visitors a year.



Project Number:

LIFE00 ENV/E/000402

Title: Sustainable management of wild fungus-producing forest ecosystems in Valdorba, Navarra

Beneficiary: Leoz Council (Ayuntamiento de Leoz), Spain

Total Budget: €392,000

LIFE Contribution: €175,000

Period: 03-Sep-2001 to 03-Sep-2004

Website: www.valdorba.org/micovaldorba2/pagina.shtml

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Ythan Project: Community approach helps reduce pollution in Ythan estuary

Rising pollution is threatening bird life in the Ythan estuary, northeast Scotland. The Ythan project implemented a range of education and awareness-raising activities to involve local communities in the environmental protection of the river.



Protecting water courses required community involvement.

Aberdeenshire's Ythan estuary in northeast Scotland is an extremely important site for birds, and is designated as a Ramsar Site and as an Important Bird Area. Levels of nitrates and phosphates in the estuary have been increasing in recent years. This has led to a growth of green macroalgae in estuary waters that is a potential threat to the food supply of wading birds. Current regulation is only partially effective and does not protect the estuary site from activities further upstream.

The project promoted sustainable land and river management through raising public awareness and engaging the community in a range of measures that included:

- > Local farmers were shown around two farms that were established to demonstrate the benefits of agri-environmental schemes and nutrient budgeting.

- > The University of Hertfordshire designed computer software to enable local farmers to complete nutrient budgets.
- > Farmers were encouraged to join the Rural Stewardship Scheme (RSS), to support the development of buffer strips alongside streams and rivers.
- > Water quality data was collected over a three-year period. Local people, supported by Scottish Environment Protection Agency staff, were involved in water quality sampling at eight sites and in 50 river habitat surveys.
- > Local communities organised awareness-raising events in schools and community centres. They selected river restoration sites and completed work on 12 sites.

The project also monitored changes to the condition of the river and estuary through the use of aerial photography, and bird counts were carried out every two weeks for two years. In addition, social surveys assessed public attitudes to the project and to water management at the beginning and end of the project.

The project was an excellent example of a participatory project in a rural area. The outputs of the project were considerable. Contacts with around 200 farmers resulted in a rise in applications to RSS, and more than 70 kilometres of buffer strip had been established by project end.

The project worked with farmers to complete more than 100 water management plans for farms. Amounts of suspended solids in neighbouring streams were reduced and the nutrient budgets demonstrated that fertiliser use on farms could be cut by an average 15%. Another positive result was the establishment of a forestry management plan for the Gight Woods at Methlick, a large woodland site adjacent to the River Ythan. More than 2,000 broad-leaved trees were planted at 35 riparian sites.

The project organised around 50 events, including a major conference in October 2004. Many of these events were organised and/or supported by community volunteers. The project has provided a model for similar initiatives to clean up river catchments.

Project Number:

LIFE00/ENV/UK/000894

Title: ... sustainable land management in the Ythan catchment

Beneficiary: The Ythan Project, c/o Aberdeenshire Council, UK

Total Budget: €737,000

LIFE Contribution: €358,000

Period: 01-Aug-2001 to 28-Feb-2005

Website: www.ythan.org.uk

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EcoMonte: Environmental management in Austrian Alps

The Grosses Walsertal region of the Austrian Alps is tackling environmental problems related to the depopulation of the area. The LIFE co-funded EcoMonte project coordinated measures to raise the area's environmental status to attract tourism and encourage sustainable development.

In 2000, the alpine region of the valley of Grosses Walsertal was made one of the first UNESCO Biosphere Parks in Austria. The region faces great environmental challenges as a result of a declining local community and regional activity.

Given the steepness of the valley slopes, effective management of the protective forests and mountainside meadows is of prime importance. To guarantee their continued management, it is necessary to ensure the economic viability of land-use in the region. But opportunities are limited. Commercial logging operations, tourism and agriculture are the main pillars of the regional economy.

The project continued the initiatives of the past few years to ensure the sustainable development of the region. These included the development of policy documents with the participation of the local population, the implementation of environmental agriculture practices, and the introduction of eco-tourism and energy efficiency.

The objectives included: the introduction of Integrated environment management based on the EMAS Regulation for the public sector; the use of renewable regional resources and development of a sustainable structure for tourism; and the development of the six small project municipalities to achieve e2 (energy audit) status.

Results

The project helped the area gain an Eco-Management and Audit Scheme (EMAS)¹ certification, the EU voluntary instrument which acknowledges organisations that improve their environmental performance on a continuous basis. Following EMAS guidelines, the project team developed and applied innovative sustainability criteria for economic, social and cultural issues receiving the European Award for Sustainability Reporting in 2005. Says project manager Birgit Reutz: "The EMAS system is well designed and it helped us a lot to work with such a well-defined structure. Hopefully, the added-value of LIFE participation will enable other regions to learn from our experiences."

Dissemination of the project's results has been greatly enhanced by this European recognition. Another important achievement was obtained in the field of energy. The project area was certified e3 within the 5-rating scale for energy use, which means that at least 50% of the used energy is provided by renewable resources. The project demonstrated that the use of renewable resources can be increased on a permanent basis, reversing the trend seen in recent decades.

¹ http://ec.europa.eu/environment/emas/index_en.htm



PV (Photovoltaic) panels: helping to achieve e2 (energy audit status).

Ecomonte also successfully promoted ecologically sustainable tourism in the region aimed at long-term impact. The project brought together 37 hotels and restaurants in a Biosphere Reserve Partner Network. Four hotels received the Austrian Environmental Certificate for Tourism.

Project Number:

LIFE00 ENV/A/000249

Title: Integrated Environmental Management for Sustainable Development

Beneficiary: Regional Planning Association Grosses Walsertal, Austria

Total Budget: €1,065,000

LIFE Contribution: €504,000

Period: 01-Oct-2001 to 31-Dec-2004

Website: www.grosseswalsertal.at

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ECOREG: Regional eco-efficiency for sustainable development

The EU's sustainable development strategy is based on planning, in the words of the United Nations' Brundtland Commission: "to meet the needs of the present without compromising the ability of future generations to meet their needs". The Ecoreg project set out to provide a sound basis for this planning at regional level, by developing eco-indicators and a complementary monitoring tool.

For sustainable development to work, countries and communities must find ways of applying the concept of eco-efficiency coherently across the environmental, economic and social dimensions of development. Different levels of government are responsible for sustainable development policy, and have a major role to play in ensuring this policy is implemented in an informed way. In order to achieve this, reliable, up-to-date and quantified information is needed, as are assessment tools to interpret the information.

The Ecoreg beneficiary, the Finnish Environment Institute, sought to provide this information by considering regional economic, environmental and socio-cultural factors as part of an analysis of eco-efficiency for sustainable development. A series of eco-indicators across four categories was developed:

- > 21 socio-cultural indicators covering eight themes: population change, employment, social exclusion, health, safety, education, culture and local identity.
- > 11 economic and material-flow indicators across four themes: background factors, economic growth, economic welfare of the population and material flows.
- > 26 environmental indicators relating to issues such as atmospheric emis-

sions, water quality, transport, environmental accidents, biodiversity, consumption of natural resources and energy.

- > Eco-efficiency indicators, which were developed by combining the indicators in the above-mentioned three categories.

Planning for Kymenlaakso

The indicators developed by the project were demonstrated at Kymenlaakso, a region on Finland's southern Baltic coast with a population of around 186,000. Initial analysis showed the eco-efficiency of Kymenlaakso improved between 1995 and 2002, but that the region faced significant threats, chiefly contamination of soil and water resources, eutrophication of waters, risk of environmental accidents, climate change, ecotoxicity and biodiversity loss.

The project's results were included in the Regional Plan for Kymenlaakso, indicating the way in which the development of the eco-efficiency assessment mechanism brought together different interested parties, including the regional authorities and industry. The indicators and the analytical tool for assessing them are relevant to developing policy at all levels: the results are highly transferable

to both larger and smaller regions, municipalities, and even to companies or organisations in the context of their environmental management systems.

Indicators developed by the project were applied in the Kymenlaakso region.



Project Number:

LIFE02 ENV/FIN/000331

Title: The Eco-Efficiency of Regions - Case Kymenlaakso

Beneficiary: Finnish Environment Institute, Finland

Total Budget: €681,000

LIFE Contribution: €338,000

Period: 01-Sep-2002 to 31-Dec-2004

Website: <http://www.environment.fi/syke/ecoreg>

Contact: Matti Melanen

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CER-COM+: Environmental measures boost local economy in Northern Italy

Seven cities in northern Italy, Comunità Montana, have teamed up to implement a raft of environmental measures including the establishment of guidelines for sustainable development and the promotion of responsible tourism. LIFE co-funding helped the region achieve the EMAS environmental management certification, while also aiding economic development.

The Comunità Montana lies in an area of exceptional environmental importance in the Nure and Arda valleys of North Italy. The community set out to introduce environmental policies and bolster its reputation for environmental excellence as a way of attracting tourists and businesses to the area.

Achieving EMAS¹ (the EU's Eco-management and Audit scheme) certification is an important part of the region's development strategy. The community aims to boost tourism by improving the area's environmental reputation and to strengthen the brand value of its traditional agricul-

tural produce through designation of origin and quality labelling. Certification is key to the success of both of these ongoing initiatives.

In order to achieve this status, Comunità Montana, with the aid of LIFE programme funding, addressed the problems of waste, landslides, and wastewater dumping. It coordinated improvements in waste collection and the reduction of non-authorised disposal areas; it introduced policies to prevent landslides and control existing land movements, and it helped reduce pollution of water sources.

Initiatives to reduce the damage caused to industry and the environment by these problems have continued. Together with the local authorities, Comunità Montana has set targets to be reached by the end of 2007, as part of a €4,900,000 investment plan. In accordance with the drive to stabilise the third of the region's territory that is subject to landslides, the plan aims to add 100 hectares of forest. The plan also aims to increase waste collections to reach a quarter of all waste and to reduce by 25% the amount of wastewater not treated. New water purification (depuration) plants are being built and the sewer system is being extended to include previously unconnected settlements.



The project helped to reduce pollution of water sources.

This action plan is a direct result of the LIFE project. A coordinated approach that includes all the relevant stakeholders and cooperation between towns and cities has been a lasting legacy of the project. It encouraged local populations to take an active interest in environmental protection and reinforced the link between environmental certification and economic prosperity. EMAS registration will ensure continued efforts.

The economic benefit to Comunità Montana of the implementation of the action plan is estimated to be about €1.8 million annually, along with the creation of hundreds of new jobs. The LIFE project has served as a model for seven other mountain communities in northern Italy.

¹ http://ec.europa.eu/environment/emas/index_en.htm

Project Number:

LIFE02 ENV/IT/000092

Title: Comunità Montana EMAS II Certification

Beneficiary:
Comunità Montana, Italy

Total Budget: €187,000

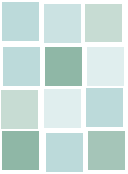
LIFE Contribution: €93,000

Period: 01-Oct-2002 to 31-Dec-2004

Website:
<http://cercomplus.sintranet.it>

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Water management

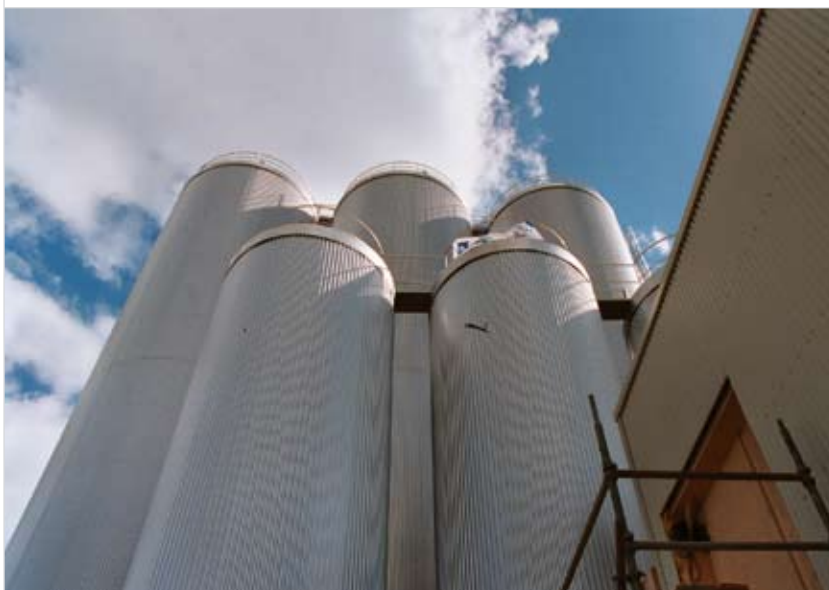
The Water Framework Directive 2000 sets out a timetable of actions for Member States to follow in order to achieve good status of waters by 2015. It has introduced the objective to achieve good ecological status for surface waters and has therefore emphasised the need to understand and monitor water resources from a different perspective.

Any activities which impact negatively on a water body in terms of it reaching good status must be identified and addressed. Intrinsically therefore, integrated river basin management is advocated, and issues such as water pricing, water and wastewater treatment and transport, flooding and irrigation; pollution prevention and planning are covered by the directive.

WFD Directive (2000/60/EC) <http://europa.eu/scadplus/leg/en/lvb/l28002b.htm>

Dairy no water: Towards self-sufficient dairy food production

Dutch dairy food producer, DOC Kaas, made great water savings in its cheese, whey and concentrated milk business by using condensate from the evaporators in the production process. The LIFE-Environment project cut the amount of water the company wastes by 35%.



At the new plant, the beneficiary sought to close the internal water cycle.

DOC Kaas aimed for its dairy plant in Hoogeveen in the Netherlands to be completely self-sufficient in terms of water. All the water needed for the production of dairy products would come from condensate fed back into the process. The LIFE project set out to achieve this aim and, as a consequence, greatly reduce the amount of water the company wastes.

Water present in milk is filtered off in the production of cheese whey, and this water can be used again in the process cycle. The project designed a method for extracting the water – ensuring it met the required standard for re-use in the process – and

a system for managing the process. A flow of water was created in the factory with water buffers of different temperatures and several heat/cold exchangers. By not having to pump water from a water supplier, energy savings were also possible.

Water and energy savings

While the beneficiary's ambitious targets were not completely realised – the new plant is not totally water self-sufficient – the project resulted in great reductions in the use of groundwater, drinking water and energy. The beneficiary estimates that around 70% of the water current being discarded is suitable for reuse. At the end of the project, the following results

were achieved with the first production line:

- > A reduction in water intake of 550 million litres per year (275 million litres short of the 825 million litres per year target).
- > A reduction in wastewater from 800 to 545 million litres/year.
- > The elimination of the need for groundwater intake.

This reduction in the amount of ground and drinking water used is particularly important in reaching the goals set by the Water Framework Directive¹.

Cost savings were also notable. The dairy producer saved €550,000 a year through a water intake reduction of 550,000 m³ at €1 per m³. The new methodology also produced impressive energy savings. The project achieved the following results:

- > For cooling, a reduction in energy use of 6,196,097 kWh/year. Such a result translates to a reduction of CO₂ of some 3.5 kton/year.
- > For heating, a reduction in energy use of 2,408,418 m³ gas per year. This translates to a reduction of CO₂ of around 4.3 kton/year.

¹ WFD (2000/60/EC) http://ec.europa.eu/environment/water/water-framework/index_en.html





Water management



Other cheese and whey factories could benefit from the technology.

DOC Kaas aimed for water self-sufficiency at its new dairy plant.



Water & milk

The European dairy industry produces more than 6,200 million kg of cheese from around 55,800 million litres of milk. Cheese consists of 42% water, in contrast with milk, which is 88% water. Traditional cheese factories, however, use 0.8 litres water to process 1 litre of milk and drain off 1.1 litres of wastewater. The water used can be divided into two types: internal process water and cooling water.

With the current installation, a total annual CO₂ reduction of some 7.8 kton has been achieved.

The main obstacles to achieving the project's objectives was the complexity of water management and a higher than expected demand for water at the new plant. The beneficiary is continuing efforts towards achieving the objective of becoming self-supporting in water. It is improving water management and identifying further ways to reuse wastewater.

Long-term effects

The potential for transferring the project's technology to other cheese and whey factories as well as other companies in the food sector is high. Implementing the new water management system is complex and will mainly interest companies about to build new production plants. Nonetheless, self-supporting plants will become increasingly attractive as discharge taxes and costs of drinking water and groundwater increase.

More investment is needed to make the Doc Kaas plant self-supporting in water. The project beneficiary, however, says that financial gains are too low to make such investments

economically viable. Groundwater is relatively cheap compared with the cost of re-using the water contained in milk.

The new dairy plant in the Netherlands took account of environmental concerns and sought to avoid costly later adjustments to its design. It was favourable to aim for a near water-self-sufficient plant. Protecting the environment gives the new plant a strong marketing position.

Project Number:

LIFE03 ENV/NL/000488

Title: A dairy industry which is self-supporting in water

Beneficiary: DOC Kaas BA Hoogeveen

Total Budget: €7,023,000

LIFE Contribution: €975,000

Period: 01-Dec-2002 to 01-Jul-2005

Website: www.dockaas.nl

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Email: info@dockaas.nl

ANPHOS: A new process for treating phosphate-rich wastewater

The ANPHOS project tackled the major environmental problem caused by phosphates in wastewater. When these pollutants enter freshwater systems, the unchecked growth of aquatic weeds and algae results in deoxygenisation of watercourses. The consequence can be 'dead zones' devoid of life.



Wastewater treatment demonstration plant at Kruiningen, the Netherlands.

LIFE beneficiary Lamb-Weston/Meijer V.O.F. (LMW), an international potato products company with a European base in Kruiningen, the Netherlands, was keenly aware of the problems caused by phosphate-rich wastewater. LMW's processes generate large effluent volumes, which were previously treated with metal salts, such as iron chloride. However, the main result of this was to transfer the problem from the effluent to a resulting sludge containing iron phosphates, which must itself be disposed of. Commonly the sludge was landfilled, incinerated or dumped at sea.

LMW carried out a successful research project with Dutch government assistance to approach the problem using a different technique – the struvite process. In this process, phosphate-rich wastewater is

treated with magnesium oxide and the resulting struvite can be used to produce magnesium ammonium phosphate crystal, which can be used as a fertiliser, thus closing the phosphorous cycle.

Large-scale challenge

The challenge was to apply the research on a large-scale to industrial effluents resulting from potato processing. The LIFE programme supported LMW in the ANPHOS project, which aimed to build a demonstration wastewater treatment plant at the Kruiningen facility, one of the largest in the world. As well as testing the process, the project would produce valuable data on operating conditions, providing a foundation for the application of the struvite process in other industrial plants.

The project opened a demonstration installation with a capacity of 100 m³ per hour in February 2004. Testing demonstrated clear environmental benefits:

- > Cutting the amount of phosphate per ton of potato processed from 0.3 kg to 0.05 kg
- > Reducing the phosphate content of effluent by as much as 90%
- > Possible recycling of 75% – almost 1.5 million m³ per year – of effluent
- > Keeping heavy metal residues in the struvite to legal limits

Cost-cutting benefits

In addition, LMW calculated substantial cost benefits from the new technology: operating costs were expected to be reduced from €275,340 to €203,800 per year.

Enabling companies to cut costs while introducing new technologies also promises future benefits in terms of employment growth, especially as struvite technology has the potential to be applied across a number of food manufacturing processes, including starch, milling and sugar.

Project Number:

LIFE03 ENV/NL/000465

Title: Environmentally friendly phosphorus removal in anaerobe effluent ...

Beneficiary: Lamb-Weston/Meijer V.O.F., The Netherlands

Total Budget: €965,000

LIFE Contribution: €170,000

Period: 01-Dec-2002 to 01-Jun-2005

Website:

<http://www.lambwestonmeijer.nl/>

Contact: Cees van Rij

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Bothnian Bay: Managing the common sea

Human activities pose a threat to the marine environment of Bothnian Bay in the Baltic Sea. The Bothnian Bay LIFE project developed a database for the exchange of information about the bay's water quality and introduced a plan for the sustainable management of this important conservation area.

Located between Finland and Sweden, Bothnian Bay is the most northern basin of the Baltic Sea. The bay, which freezes over for several months of the year, is particularly vulnerable due to the scarcity of species living in it, its arctic conditions and its shallow, brackish waters (average depth 40 metres). Moreover the bay is exposed to pollution from the local steel, pulp and paper industries as well as from sewage treatment plants. And even more importantly, the bay is affected by agricultural and forestry practices, peat mining, and to a certain extent, by localised construction work related to sea transport.

Tools for managing the sea area

Many different national and regional bodies monitor environmental conditions in the bay, and the project identified the need to pool together various information sources. To achieve this aim, the project built up an extensive online database under the guidance of the beneficiary, the North Ostrobothnia Regional Environment Centre (NOREC) in Finland. The database features various indicators of water quality in the bay:

- > Physical and chemical data from 62 observation points.
- > Results of mobile automatic water quality monitoring.

- > Data on the material transport and water discharges of 31 rivers and use of the land in their catchment area.
- > Information about the 52 industrial plants and wastewater treatment plants discharging into the bay, including annual loading data.
- > Top ten lists of pollutants for rivers, industries and wastewater treatment plants.

In addition to the database, the project also developed a web-based Best Available Technology (BAT) information exchange system for the metal industry and produced a versatile exhibition for dissemination purposes.

The project, which began at the end of 2001, also developed a model for estimating the impact of human actions on the coastal areas. The Bothnian Bay Water Quality and Ecosystem Model allows experts working in the area to assess the impact of loading on water quality. Assessments are made by calculating likely changes to the concentration of soluble nutrients and algae. Human activity has caused nutrient enrichment that disrupts the bay's ecosystem.

The project surveyed the views of a wide range of experts and stakeholders to produce an action plan for Bothnian Bay. The plan outlines targets and priorities for sustainable development and sets guidelines for monitoring and status assessments.



Information stand: spreading knowledge about the bay's water quality.

It also aims to meet EU and national environmental requirements and to improve information exchange and cooperation in the Bothnian Bay area. NOREC is continuing to cooperate with the project partners to implement the action plan and maintain databases.

Project Number:

LIFE00 ENV/FIN/000646

Title: Integrated Management System for the Bothnian Bay

Beneficiary: North Ostrobothnia Regional Environment Centre

Total Budget: €1,049,000

LIFE Contribution: €520,000

Period: 01-Aug-2001 to 31-Jan-2005

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Minimising the environmental impact of economic activities

European Union policy on the environmental impact of economic activities is implemented through a wide range of instruments. The most important legislation includes the 1996 Directive on Integrated Pollution Prevention and Control (IPPC), which aims at minimising emissions to water, air and soil from industrial point sources throughout Europe. The directive defines common rules on the authorisation of permits for industrial installations, which have to be based on Best Available Techniques (BAT). BAT refers to the most advanced techniques that can be used to achieve a high level of environmental protection for the industrial sector in question.

Directive 96/61/EC <http://ec.europa.eu/environment/ippc/index.htm>



RefinARS: Reducing the environmental impact of refineries

The process of obtaining light oils from heavy ones creates sulphur dioxide. The Italian RefinARS project developed a means of using an absorbent to recover sulphur and reduce the overall environmental impact of the refining process.

Fluid Catalytic Cracking (FCC) is a frequently used process in refineries for separating oils. During the process, carbon deposited on the surface of the catalyst is burnt, transforming the sulphur content into sulphur dioxide, a strong pollutant. Alkaline solutions (sodium hydroxide and calcium hydroxide), which are used to absorb the sulphur dioxide, create sulphates and sulphites that are damaging to the environment.

The RefinARS project aimed to "desulphurise" flue emissions resulting from the refining process, using an absorbing buffer that allows sulphur to be recovered and regenerated. This buffer solution contains sodium hydroxide and phosphoric acid. It was implemented at ENI's Sanazzaro refinery plant in northern Italy, which has a capacity for processing 10 million tons/year of crude oil.

The project's chief task was to optimise the process for regenerating the buffer used to scrub the flue gas coming from a FCC unit. To perform this task, a regeneration plant was constructed and connected to the FCC plant.

The buffer regeneration process is based on the evaporation of the solution coming from the FCC flue gas desulphurisation. The process produces a



Photo: Marco Roccato

Buffer regeneration plant at ENI's Sanazzaro refinery.

gaseous stream (containing SO_x, sent to the sulphur recovery unit), the regenerated buffer that can be recycled to the FCC flue gas desulphurisation, and a minor solid waste.

Construction work on the buffer regeneration plant began in July 2002 and was completed in May 2003. Optimisation of the process began in September 2004 when charges with different sulphur content were fed into the FCC unit and the circulating buffer flow rate was changed.

Setting the standard

Tests were carried out to compare performance and analyse the overall environmental impact. The following results were achieved:

- > Sulphur dioxide emissions reduced to 250 mg/Nm³ in flue gas (about 1/6 of the legal limit).
- > The efficiency of sulphur dioxide removal raised to above 85%, with corresponding recovery of saleable sulphur.
- > Achieving 460 kg/day of solid waste, eliminating any impact the industrial plant has on transportation and soil.



- > The concentration of sulphates and sulphites in wastewater reduced to negligible amounts.
- > Saving of 97% on absorbing solution replacement and 25% on energy.
- > 40% saving in FCC operating costs.

The results achieved at the plant were stable over time, an important factor for the feasibility of the technology. RefinARS showed that it is possible to feed refinery plants with high-sulphur content without increasing pollutant emissions. It demonstrated that high quality refined products can be obtained from poor raw materials and that plants struggling to meet environmental targets can improve their performance. High investment costs may be an obstacle, but it is estimated that the initial outlay will be recovered through financial savings within five years

Spreading the word

The environmental and economic benefits of the RefinARS project render it a Best Available Technology (BAT) for FCC flue gas desulphurisation. The technology can be implemented in the other 53 cracking plants (FCCs) in the EU and in 49 sulphur recovery plants.

The technology is highly reproducible and can be applied to other industries with similar emission problems (sulphuric acid production, metallurgy).

A license to use the patent can be obtained from the company, and the Valero Company has asked for permission to implement the project in one of its refineries in the US.

In fact, the dissemination programme to reach potential interested parties at a local, regional, national and EU level was an important aspect of the project. Public administrations and institutions were contacted as well as relevant industrial sectors.

According to the beneficiary, "The possibility of updating EU environmental policy and legislation in light of the introduction of the new proposed technology might also be assessed." Implementing the RefinARS methodology could help refineries comply with the IPCC directive¹ and the Auto-Oil II Programme² that set a limit on the amount of sulphur in petrol.

¹ Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control. <http://eippcb.jrc.es/pages/Directive.htm>

² COM (2000)626 http://ec.europa.eu/environment/docum/00626_en.htm

Inside the refinery: desulphurised flue gas stack.

Photo: Marco Roccato



Details of the new plant showing the stripper (top) and evaporator (bottom right).

Project Number:

LIFE00 ENV/IT/000012

Title: Absorption & recovery of sulphur from flue gas of the Fluid Catalytic Cracking...

Beneficiary: ENI Spa, Italy

Total Budget: €8,767,000

LIFE Contribution: €1,274,000

Period: From October 2001 to September 2004

Website: www.agip.eni.it/rmit/agip/internal.do?mnselected=agip_refinars&channelId=-1073758245&menu=false&mncommand=openById&mnparam=agip_refinars&lang=en&sessionId=1114203

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Photo: Marco Roccato



Minimising the impact
of economic activities

DETECTIVE: Dry-cleaning with liquid carbon dioxide

The Netherlands-steered Detective project has achieved remarkable success in developing a new dry-cleaning technology. Involving partners from five EU Member States, the three-year LIFE co-funded project successfully demonstrated that textile cleaning with liquid carbon dioxide (LCO₂) is a safer, more eco-friendly and competitive alternative to perchloroethylene (perc), the current first-choice dry-cleaning solvent in Europe.

Dry cleaning operations release more than 70,000 tonnes of perc per year in Europe. The VOC Solvents Directive¹ on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations, is the main instrument for the reduction of VOC emissions in the European Community. The dry-cleaning sector is specifically addressed in this directive. Used by 95% of EU dry cleaners, perc is also thought to carry risks to human health and reproduction and shows toxic effects (neuro-toxicological impairment, kidney damage and carcinogenetic effects).

At the beginning of the project in 2000, textile cleaning with LCO₂ was emerging as a promising new technology. But at that time only bench-scale tests were available and full-scale experiments had still to be conducted.

The project consortium (including Electrolux and Aga/Linde of Sweden) was steered by the beneficiary Krom Stomerijen, a Dutch dry-cleaning company. The team sought to optimise full-scale application of the new technology.

¹ 1999/13/EC of 11 March 1999
<http://eur-lex.europa.eu/LexUriServ/site/en/consleg/1999/L/01999L0013-20040430-en.pdf>



At the end of the project (June 2004) the project had met its prime objective: demonstrating dry-cleaning of textiles using LCO₂ two full-scale pilot units – one in Denmark and the other in the Netherlands.

The project also supported the establishment of a franchise textile-cleaning organisation – Hangers Cleaners Europe www.hangerseurope.com by project partner AGA/Linde AG. Although the new technology is just starting to establish itself in the market, the team believes it is sufficiently developed to receive policy incentives and that its emergence provides a sustainable alternative to perc.

At the beginning of the project in 2000, textile cleaning with LCO₂ was emerging as a promising new technology.

Performance advantages

LCO₂ is non-toxic and non-flammable. It is produced in an almost pure form in oil refining and ammonia production. It also causes no groundwater contamination. As a renewable resource, LCO₂ has an advantage over perc, which is made from exhaustible mineral reserves. It is separate from the combustion processes and not released as a greenhouse gas.



The full scale pilot demonstration testing took place at the beneficiary Krom Stomerijen, in Gorredijk the Netherlands and at project partner Kymi Rens, in Aalborg, Denmark. LCO₂ is distilled and recycled in a closed system at these pilot sites. Each pilot has a rotating drum with a volume of 120 litres and a garment load capacity of 15 kg in the Netherlands and 17 kg in Denmark. The project achieved excellent results in both countries using 38 different textile materials and nine different garment articles.

The performance of industrial LCO₂ textile cleaning machines in the Netherlands and Denmark was compared to that of conventional perchloroethylene (perc) dry cleaning as regards stain removal, effect on textile properties, energy, safety and cost price. In addition, several comparisons were made with three other alternatives for perc: wet cleaning, hydrocarbon cleaning and cyclosiloxane cleaning.

The cleaning performance of LCO₂ ranged from 60% to 100% to that of perc depending on the nature of the stain. Cleaning performances in relation to the three other potential alternatives to perc dry cleaning were even better. In several cases LCO₂ was found to be more effective.

Other advantages of LCO₂ textile cleaning over perc dry cleaning were also found. The method causes less:

- > Dimensional change to sensitive fabrics.
- > Fabric colour loss (especially for pigment colours).
- > Direct colour bleeding from one fabric to the other.
- > Loss of glitter glued on basic fabrics.
- > Loss of oily/fatty finishes.
- > Damage to coatings or laminates that swell in perc.



LCO₂ technology could replace perc completely within the next 10-20 years.

- > Loss of textile fibres during the cleaning cycle, leading to longer garment lifetime.

The development of detergents for LCO₂ is still in its infancy. Available detergents for LCO₂ textile cleaning have been shown to increase cleaning performance, but results depend on the type of stain. Further improvements to detergents and machine input methods are expected.

Drawbacks

The project identified, however, certain drawbacks to LCO₂ textile cleaning compared to perc dry cleaning. It found that there was greater diffuse greying or soil re-deposition of fabrics during LCO₂ textile cleaning. This effect can be reduced by adding dummy fabrics made from (di-)acetate with each cleaning cycle. These fabrics provide preferential sites for re-deposition and greying. Another option is to filter LCO₂ during cleaning, similar to filtering common in perc dry cleaning.

LCO₂ textile cleaning also resulted in sharp creasing of fabrics susceptible to cold conditions (typically 5°C) during cleaning and decompression. Creasing can be minimised if the latter step occurs at a higher temperature during the last 10 minutes. To be comparable in price with perc, LCO₂ cleaning requires greater quantities. Such quantities may be prohibitive for smaller dry cleaning outlets.

Cost analysis

The project arrived at the following conclusions:

- > LCO₂ textile cleaning is more efficient than perc in resource use and waste disposal once the minimum quantities are used.
- > Costs of make-up solvents and detergents are comparable to perc dry cleaning.
- > LCO₂ textile-cleaning labour costs are comparable to those of perc dry cleaning.



Minimising the impact of economic activities

- > Investment-related costs of LCO₂ textile cleaning per year are higher, but equal per kg of cleaned garment. This is due to the higher annual capacity of the LCO₂ textile cleaning machine, at two cycles per hour, compared to perc dry cleaning at two cycles per 1.5 hour. These values were confirmed by professional use. The conventional perc dry cleaning times were confirmed by measurements at KROM.
- > The overall costs of LCO₂ textile cleaning are 20% lower than those of perc dry cleaning: €1.17 per kg of textile versus €1.43. This result is mainly due to the shorter turnaround time of LCO₂ textile cleaning. These values were partially validated by TNO's (the Netherlands Organisation for Applied Scientific Research) annual surveys of the textile cleaning sector. Values for individual companies can deviate by 10%, occasionally up to 20%, mainly driven by internal logistics.

In the comparison trial, LCO₂ technology scored the highest of the five methods.

Detective posted excellent results for LCO₂ textile cleaning.

LCO₂ safety

Several safety aspects have to be considered during installation and operation of the LCO₂ textile cleaning process.

- > Safety valves installed in the LCO₂ storage vessel and cleaning unit. Valves also have to be checked regularly.
- > The pressure vessels have to be checked according to national regulations.
- > LCO₂ textile cleaning units have to be manufactured according to CE mark provisions.
- > Extensive monitoring of indoor LCO₂ levels is required to detect any unanticipated LCO₂ release. If levels exceed 0.5%, LCO₂ alarms must go off and machines must be shut down. This level is equal to the eight hours' exposure threshold limit.
- > When filling storage vessels, LCO₂ gas expansion cold traps must be prevented as they can block piping.

Combination of wet and dry cleaning points the way

LCO₂ textile cleaning is best combined with wet cleaning to clean the entire spectrum of consumer garments and textiles including curtains and sheets. Combined LCO₂ and wet cleaning can competitively replace current hazardous perc dry cleaning methods and has several environmental benefits. Replacing perc by LCO₂ eliminates annual emissions of 70,000 tonnes of perc into the atmosphere.

It also improves working conditions and allows pregnant women to work in textile cleaning.

While still only recently introduced to the market, the technology has the potential to replace perc completely within the next 10 to 20 years. The speed with which it will replace perc depends on the obsolescence of current perc machines, the price and control of perc, available investment funds, knowledge transfer and governmental regulations.



Project Number:

LIFE00 ENV/NL/000797

Title: Demonstration Textile CO₂ Treatment Introduction Validation Effort

Beneficiary: Krom Stomerijen B.V.

Total Budget: €804,000

LIFE Contribution: €241,000

Period: 01-Jul-2001 to 30-Jun-2004

Website: www.krom.nl and www.hangerseurope.com

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OSIS: Improving oil spill detection in the North Sea

Ships and offshore installations are the most common sources of more than 500,000 tons of oil spilled into the marine environment every year. The OSIS new surveillance system, developed thanks to LIFE co-funding, is helping to identify leaks and plan corrective action.



OSIS oil spill detector sensor is now being developed for ships.

Europe is the world's largest market in crude oil imports, representing about one third of the world total¹. A very high percentage of oil and refined products are transported to and from Europe by sea. Inevitably, some of this oil makes its way into the marine environment.

Accidents that had massive environmental consequences, such as the "Prestige" or "Erika", powerfully illustrate the devastation that can be caused by ship pollution. However, even routine ship operations pollute the sea through ballast water, tank washings and engine room effluent discharges.

Every day, large amounts of oil deliberately pumped into the sea by ships along almost the entire coast-

line of Europe. Together with large oil spills, such pollution constitutes a major threat to the environment and places enormous demands on national authorities responsible for rapid response and clean-up operations. Tackling this environmental threat is the 1992 Convention for the Protection of the Marine Environment of the Northeast Atlantic, the OSPAR Convention. OSPAR defines special areas with tough emission limits for oil pollution

¹ Source: Energy Information Administration <http://www.eia.doe.gov/emeu/ipsr/t31.xls>

² Source: Global Marine Oil Pollution Information Gateway <http://oils.gpa.unep.org/facts/sources.htm>

OSIS improves oil spill detection in the North Sea.

Effectively controlling oil pollution has, however, proved difficult. Airborne Surveillance Systems currently used to control outlets of oil are too expensive to be utilised efficiently against the large number of offshore installations. Together with ships such installations are the most common sources for the more than 500,000 tons of oil spilled annually into the marine environment². The lack of monitoring systems means that offshore installations have not yet been included in the strict OSPAR rules governing oil pollution in designated special areas.

OSPAR call for technologies

"In the late 1990s, OSPAR called for technologies, such as OSIS (Oil Spill Identification System) to be developed so that they could enforce a new type of regulation in those special areas," said project manager Peter Moeller-Jensen of OSIS International, a privately owned Danish SME. The OSIS team thus sought to demonstrate a potential solution to this widespread





Minimising the impact of economic activities



OSIS sensor system shown here at the front of the oil rig.

tem allows improved and continuous monitoring that is more effective and less costly than the current use of planes. OSIS is also cheaper and more accurate than systems based on conventional satellite imagery.

Raising awareness

Additionally, the OSIS team carried out exemplary awareness-raising activities directed at decision-makers. In 2003, OSIS was presented at the OSPAR/Helsinki Convention ministerial meeting (June 2003), the IMO Marine Environment Protection Committee (July 2003) and a GIS Remote Sensing Symposium (July 2003). In 2004, OSIS contributed to the OSPAR technical working group meeting, InterSpill2004 Conference and Exhibition and the Offshore Northern Seas Conference. Finally, OSIS attended the EU Management Committee on Marine Pollution (MCMP) in Brussels where all parties involved in national pollution prevention were present.

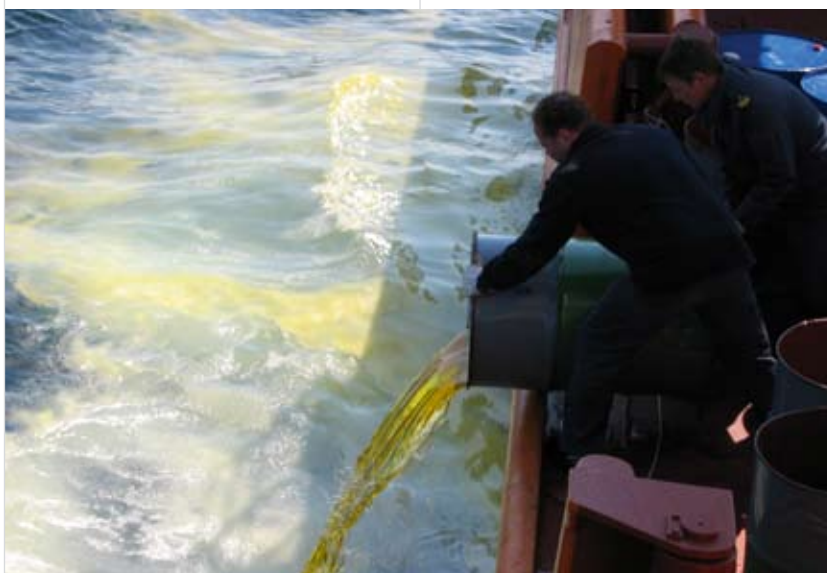
problem of international concern by developing online remote monitoring of offshore installations in any location based on new sensor technology. The new system would use a new generation of communication satellites and the Internet.

The project, which began in January 2002, aimed to demonstrate the technology required for the implementation and enforcement of programmes and measures adopted under the OSPAR strategy. It would also provide a tool required to implement Community environment policy and legislation concerning the marine environment, as specifically stated in Danish national law from 1998.

Taking up the challenge of helping to develop a new generation of sensor technologies, aside from project beneficiary OSIS, were the partners, the Danish agencies for trade and industry, environmental protection and energy.

North Sea tests with oil substitute

The project's fully achieved the objective of demonstrating the viability of a permanently mounted sensor system to identify oil discharges from offshore installations in those parts of the North Sea designated as 'special areas' by the International Maritime Organisation (IMO). This was achieved by the development of technology providing 24-hour online surveillance. According to the beneficiary, the OSIS sys-



OSPAR

The OSPAR Convention [<http://www.ospar.org/eng/html/welcome.html>], which entered into force in March 1998 and includes the participation of the EU, develops new programmes and measures required to identify, prioritise and monitor the emissions, discharges and losses of substances to the marine environment.

These activities were supplemented by a media campaign that led to numerous articles in relevant trade publications.

Over a three-year period, numerous tests were conducted including missions with the Danish Environmental survey ship as well as with German and Dutch oil combat services in the North Sea. The OSIS sensor is able to identify oil-films from a thickness of 0.01 to 1.5 mm on the water surface. It can estimate the leaked volumes with +/-25% accuracy in normal weather conditions and with some +/-50% accuracy on rough seas. The extension of the leak can be monitored up to a distance of up to 5 kilometres from the sensor.

Latest sensor aboard "Cunнар Seidenfaden".

Data gathered by OSIS is also transferred via satellite to onshore decision-makers and can be used in conjunction with the geographical information system (GIS). This provides further information as to the context of a leak and helps the planning of corrective actions. "This will enhance the information for decision-making concerning corrective action and also provide opportunities for efficient clean-up operations," says Mr Moeller-Jensen.

This demonstration project, which closed in April 2005, was able to post impressive results from tests for the detection of spills surrounding oils rigs in the North Sea. OSIS technology, designed for fixed offshore structures such as oil platforms, is also proving attractive for maritime transport.



Close-up of the permanently-mounted sensor.

A new LIFE-Environment co-funded project, launched by the same beneficiary in 2004, "Oil Spill Identification System for Marine Transport" (LIFE04 ENV/DK/00076) is currently adapting the OSIS sensor and transmission system for ships.



Project Number:

LIFE02 ENV/DK/000151

Title: Sensor for identification of oil spills from offshore installations

Beneficiary: OSIS International, Denmark

Total Budget: €3,359,000

LIFE Contribution: €867,000

Period: 01-Jan-2002 till 30-Apr-2005

Website: www.osis.biz

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Stiim: Traditional thermo techniques to treat cereal seeds

Project Stiim implemented a new system for treating cereal seeds in a Swedish plant using traditional thermo-techniques. It showed that it is commercially viable to ensure seeds are disease free without the use of pesticides.



Treating cereal seeds using traditional thermo-techniques.

Researchers in Sweden have looked to the past for inspiration. Using traditional thermo techniques to treat cereal seeds, a non-chemical system was devised and implemented with the assistance of the LIFE programme.

The former technique placed seeds in baths of hot water to kill off pathogens with low heat resistance. It was a time-consuming, energy-intensive and unpredictable process. Chemicals, though not without their risks, were a viable and attractive alternative. The use of chemicals, however, could be harmful to groundwater and eco-systems and posed health risks, especially to employees in the sector and animals.

Back to the future

For these reasons, researchers from Acanova AB (now Seedgard AB), a Swedish company specialising in inventions for the agriculture and forestry sectors, worked with colleagues from the Swedish University of Agricultural Sciences to develop a more environmentally friendly technique. They devised a thermal seed treatment process, ThermoSeed, which uses hot humid air as a heating medium and fluid bed technology to ensure even exposure of thick seed layers. Small-scale testing in several countries of Scandinavia and central Europe has produced promising results.

A larger scale demonstration was necessary, however, in order to develop the system for commercial use. In 2004, Acanova began work on the LIFE-supported project, Stiim, with the beneficiary Svenska Lantmännen, the cooperatively owned leader in the Swedish seed market.

The Stiim project successfully tested a prototype treatment plant with heating and cooling systems, sensing devices, system control software and transportation facilities. The system was capable of processing 30 tons of cereal seeds per hour and is expected to reduce use of seed treatment chemicals by some 2.5 tons of active ingredients per year – equivalent to 4% of Sweden's annual use of these chemicals.

After evaluation by sampling, testing, and quality control of the prototype, a full-scale processing system was developed that has the capacity to treat more than 200 tons per day. As a result of the effectiveness and low energy consumption of the system, ThermoSeed has been approved by the Swedish Seed Testing and Certification Institute as an alternative to chemical seed treatment. The first ThermoSeed plant was opened in Skara, Sweden in September 2005.

Though the new technique is not suitable for all cereal types, it has been shown to be highly effective for most strands of barley, wheat, oats and rice seeds. It is cost effective and testing on other seed types, such as vegetable seeds, has been promising.

Project Number:

LIFE03 ENV/S/000600

Title: Thermal Seed Treatment – An Integrated Approach ...

Beneficiary: LIFE03 ENV/S/000600

Total Budget: €1,431,000

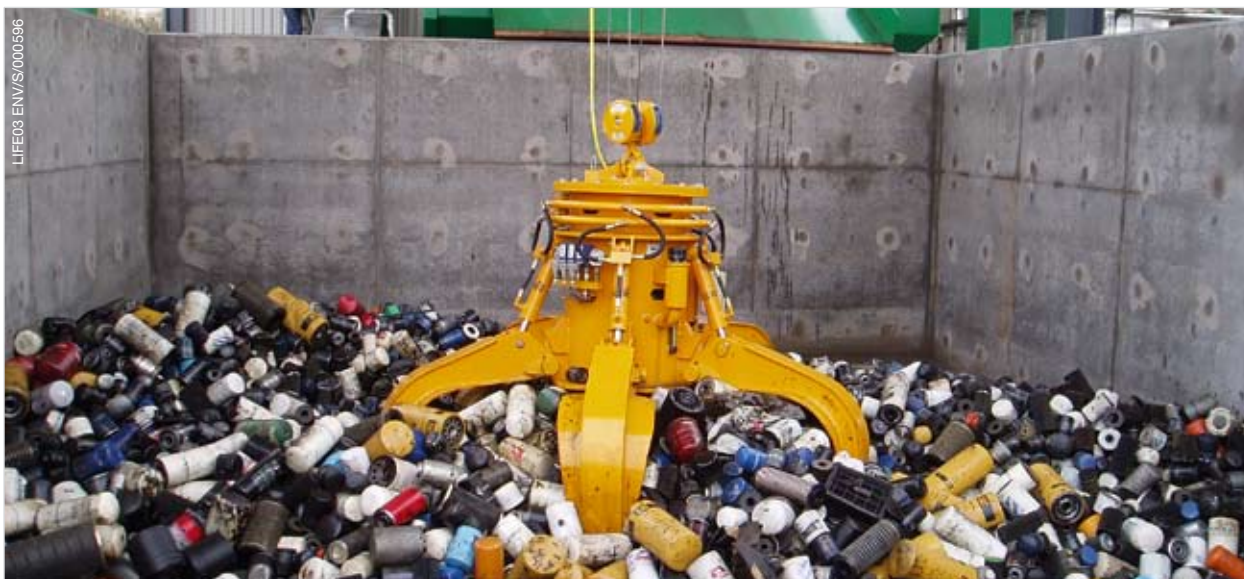
LIFE Contribution: €254.000

Period: 01-Jan-2003 to 30-June-2005

Website: www.thermoseed.com

Contact: Lage Ringstad

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Waste management

The Commission's Thematic Strategy on the Prevention and Recycling of Waste is one of the seven thematic strategies set by the Sixth Environmental Action Programme (6th EAP). The approach to waste management is to contribute to reducing the environmental impacts of using material resources by avoiding waste generation (prevention) and increasing the amount of recycling and recovery of materials and energy from the waste we produce. This long-term policy is having significant results. Over the past ten years, the EU has doubled the amount of municipal waste recycled to more than 80 million tons per year, and several EU countries have managed to achieve recycling rates for packaging waste of over 60%.



PAROC-WIM: Recycling waste boosts stone wool melting

The PAROC-WIM project developed an alternative recycling process for mixing waste with cement to make briquettes. The new system fed process waste back into the melting furnace, making optimal use of raw material, reducing harmful emissions and offering cost savings.

The main objective of the LIFE co-funded project was to minimise the amount of waste from the manufacturing of stone wool by injecting the process waste, which is fine fractioned material, into the melting furnace. The Waste Injection into the stone wool Melting (WIM) process developed a system for feeding the waste material back into the furnace. This new system also allowed other fine fractioned materials, in particular fine fractioned coke, to be fed into the furnace. As a consequence, the system reduced the amount of fuel (mainly coke) needed to heat the furnace, thus lowering emissions resulting from burning coke.

The key environmental advantage of the project, however, is the reduction of waste. The total amount of waste generated in the European stone wool industry is estimated to be between 160,000 – 480,000 tons, roughly 20-60% of product output. Most waste is produced when the molten material of the furnace – a mixture of different types of rock – is spun into fibres. About 10-20% of this material is not completely turned into fibre and consequently rejected from the production process. A stone wool line with an annual wool production of 20,000 tons generates 2,000 to 4,000 tons of fiberizing process waste per year.

This waste is usually ground and mixed with cement to make briquettes. The machinery required for turning waste into briquettes represents a high investment cost and uses an extra raw material, cement. As a result of impurities in cement, melting briquettes creates high emissions of particulate matters and sulphur oxides into the atmosphere.

The Paroc project

In this context Paroc, an international company based in Vantaa, Finland, that produces building material, in particular mineral wool insulation, set about investigating an alternative use for the waste material in its stone wool production process.

The process was first introduced in Oulu, Finland, and the apparatus used in that plant served as a prototype for the system implemented at a larger plant in Hässleholm, Sweden. Teething problems at the Swedish plant included needing to replace a grinder with one that requires less maintenance. However, the team working on the project has been able to overcome these difficulties, and consequently the amount of waste material that is recycled has steadily increased.

Mats Olsson, technical support manager for Paroc, says that it didn't take long to optimise the process. "After about a year of improving the



Cupola furnaces are used for melting stone material.

process, it worked fine, and now we have more or less the solution," he says. The company's goal of 100% recycling is not unrealistic.

In Finland, the amount of waste recycled has been lower than in Sweden, but it is also increasing. The system's design has needed to take into account the limitations of the machinery and location, but improvements



have been made to optimise their use. "The time yield in Finland was low at first," Olsson says, "but it has been improved now." In fact, a year into the project, the plant at Oulu was already recycling nearly 80% of the spinning waste as raw material corresponding to over 7% of the total amount of mineral raw materials.

Refining the process

Results at the Swedish plant are still improving. In 2005, 93% of the total amount of waste (2,421 tons) was recycled, a significant increase on 88% of the previous year. Such steady improvements represent enormous savings over the course of the project. At the beginning 50 kg of waste per ton of product was injected into the melting furnace. Now, double that amount is recycled.

Fuel savings are also considerable. The energy required for melting is dramatically reduced when raw materials are replaced with "pre-melted materials". Such energy conservation has the benefit of reducing the need for coke. In the Oulu prototype the use of coke has been reduced by 8%, when about 7% of raw material is replaced with production waste.

The larger scale machinery in Hässleholm has made a greater reduction in coke consumption possible. The replacement of 5% of pure raw material with production waste results in a more than 10% reduction in the use of coke. Such a reduction of coke consumption generates a significant saving in the melting costs, as well as a decrease in the emissions of carbon dioxide and sulphur oxides.

The advantages over briquetting and other ways to recycle fibre process waste as a new material are considerable. Depending on the sulphur content in the rock and cement used, making briquettes can cause an increase of about 50% in emissions of sulphur oxides. Another key advantage of the WIM process over briquetting is its ease of implementation. Investment in waste injection costs roughly a fifth of the amount of the cost of the equipment required for making briquettes.

A bright future

Paroc says that WIM will be a standard feature of any new plants that it will build. "Now we know it's a commercially viable process, we will implement it at our other plants," says Olsson. The Hässleholm plant was built in 1975, and there was no problem introducing the new system. "The process is a simple one," he says. "You don't need to build new plants. Maybe in 10 years time, we will have it at all our plants."

The experience of implementing WIM in Finland and Sweden also offers the company a competitive advantage. "Next time [the system is implemented], because we know how to make it, the costs will be much less," Olsson says.

A final objective of the project is to make the system commercially available to other stone wool producers. It can be applied in the stone wool producing industry where cupola furnaces are used for melting stone material. Also, in the context of EU environmental policy, WIM can help meet targets for the reduction of waste and greenhouse gas emissions in a cost-effective way.

Summary of WIM's environmental benefits

- > It reduces the amount of land-filling of waste from the production process;
- > It requires less coke as a result of energy savings;
- > The amount of gas emissions caused by burning coke is reduced;
- > It saves natural resources (virgin rock, coke); and
- > New possibilities for the use of fine fractioned raw materials have been created.

Fine fractioned materials can be fed back into the melting furnace.



Project Number:

LIFE02 ENV/FIN/000328

Title: Waste Injection in the Stone Wool Melting Furnace

Beneficiary: Paroc Group, Finland

Total Budget: €871,000

LIFE Contribution: €194,000

Period: 01-Dec-2001 to 30-Nov -2004

Website: www.paroc.com/channels/com/about+us/customer+benefit/innovativeness/life.asp

Contact: Patrick Johansson

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GENPLAST: Integrated recycling plant for agricultural plastics

With the aid of LIFE programme funding, Genplast demonstrated that plastic products could be recycled as films for agricultural usage. The new technology reduces plastic waste and the environmental impact of its disposal.

The agricultural industry produces a large amount of plastic waste and its disposal has great environmental consequences. Plastic waste is commonly disposed of by incineration or by dumping in landfill sites in contravention of a European Directive (99/31/EC)¹ on the landfill of waste.

¹ http://ec.europa.eu/environment/waste/landfill_index.htm



Project Number:

LIFE03 ENV/E/000076

Title: Integrated recycling plant for agricultural plastics

Beneficiary: Genplast, S.L., Spain

Total Budget: €3,741,000

LIFE Contribution: €656,000

Period: 01-Jun-2003 to 31-May-2005

Website: www.lifegenplast.com

Contact: Rafael Cuenca Caceres

Email: rafaelcuenca@genplast.telefonica.net

Screen-shot of the informative GENPLAST website.

LIFE project beneficiary Genplast, a Spanish company that produces plastics for horticultural purposes, aimed to reduce this waste through recycling at its plastic plant. The company aimed to create new products using recycled materials that are adapted to the location in which they are used. In this way, the lifespan of the used material is maximised.

The project designed a process that uses recycling and transformation technology. It focused on the transformation of chippings – from the petrochemical industry or from the plant itself – as a raw material.

The environmental benefits of the project included:

- > Eliminating 7,000 tons of abandoned or dumped plastic waste per year as well as removing the environmental costs of transporting to landfill sites such as emissions, noise, risks and use of fossil fuels.
- > Saving on consumption of non-renewable energy sources.
- > Reducing air pollution by avoiding the need to produce new plastic and reducing the incidence of uncontrolled waste material burning.
- > Raising awareness of the problem of agricultural plastic waste management.



Transforming technology

The project achieved its objective to construct a pilot agricultural plastic recycling plant that can serve as a catalyst for the construction of similar plants in other European countries. It demonstrated the technical and financial viability of the innovative process for recycling plastic waste.

Across Europe the use of plastics in the horticultural sector has grown in recent years and is producing an increasing amount of waste. The lack of appropriate disposal of this waste in Spain and in other countries emphasises the significant impact the technology could have.

Genplast is continuing the recycling initiative of the LIFE project. It is also developing an integrated waste management system for integrated plastic film production and transformation processes.

REUSEOIL: Reducing hazardous waste by recycling used oil filters

Regularly replacing used vehicle oil filters generates a high amount of hazardous waste. The REUSEOIL project demonstrated an innovative recovery technique for used oil filters that produces recyclable oil and metal.

Europe uses an estimated 250 million oil filters a year, resulting in the disposal of up to 150,000 tonnes of metal and 75,000 tonnes of oil. The disposal of such material is subject to strict EU and national legislation.

The REUSEOIL project aimed to separate this oil and metal waste for reuse as recovered materials. Such a practice is in line with the Council Directive on end-of-life vehicles (2000/53/EC)¹ and Directives on waste oils (5/439/EEC)² and on landfills (99/31/EC)³. The beneficiary, Swedish-owned company Ragn-Sells, developed a new technique for this process that generates cleaner recyclable metal and waste oil, while eliminating fluid nitrogen and emissions of oil vapour.

The project was implemented in the following stages:

1. Pre-installation procedures.
2. Construction and installation of the recovery plant.
3. Testing of the prototype, including meticulous evaluation of measurement tests.

¹ http://ec.europa.eu/environment/waste/elv_index.htm

² <http://ec.europa.eu/environment/waste/oil/consultation.htm>

³ http://ec.europa.eu/environment/waste/landfill_index.htm

Results

The project created a fully operational pilot plant for the treatment of used oil filters with a capacity of two tonnes per hour. The plant consisted of a bunker to receive used filters, grabber, conveyor belts, shredder, granulator, centrifuge, magnet as well as supplementary facilities to store the treated oil, metal and other hazardous components.

The treatment of filters resulted in a recovery rate of 99.5% of the metal component and 98% of oil. Remains consist of mostly filter paper with a low oil and metal content. Recovered metal and oil fractions are sufficiently clean for both re-melting and regeneration.

The project also paid close attention to the filter collection system, which is essential for improved functioning of the process. The beneficiary is further developing the process and considering extending the process to its branches in Estonia and Latvia.

The results were communicated to specific target groups such as suppliers of oil filters, producers of motor vehicles and machines, hazardous waste management and treatment companies as well as local and national authorities, whose representatives were part of the project reference group.



Bunker to receive used filters and conveyor belt.

Project Number:

LIFE03 ENV/S/000596

Title: Recovery of used oil filters generating recyclable...

Beneficiary: Ragn-Sells Specialavfall AB, Sweden

Total Budget: €2,042,000

LIFE Contribution: €442,000

Period: 01-Sep-2003 to 30-May-2005

Website: www.ragnsells.se/reuseoil

Contact: Lena Stridh

Email: lena.stridh@ragnsells.se



ENVACTCARB: Producing activated carbon from xylite

The ENVACTCARB project developed a clean technology for producing activated carbon from recovery of xylite waste from brown coal mining. Xylite-based activated carbon is an environmentally friendly adsorbent that can be routinely used in the purification processes of gases or water.



Prototype plant at Gorj County.

Adsorbents are increasingly used to purify gases and water. Among them activated carbon, which effectively attaches itself to particles, has become highly popular. Demand for activated carbon has increased significantly in recent years – up 30% in the last decade – particularly as a result of the need to rapidly reach environmental targets set in the EU sustainable development policies.

The production of activated carbon is therefore a promising industry, also in terms of reusing mining waste and addressing potential cleaning up liabilities of pollution. The objective of the project was to demonstrate a technology to use the xylite as raw material for activated carbon production. The result of the pilot action was xylite-based activated carbon, which is a uniformly porous structure that proved

higher adsorption capacity than conventional activated carbon. The technology itself is a non-polluting one.

Romania supplies abundant amounts of low-grade coal – known as xylite – which due to its wood-like characteristics is an excellent material for the production of adsorbents. Since the launch of the project in 2002, the beneficiary, the Metallurgical Research Institute (ICEM), together with its partners, developed the technology of production of the activated carbon from xylite that proved both technically and economically viable.

Wide-reaching benefits

In the first stage, the beneficiary engineered and installed a prototype small-scale plant of nominal capacity of 50 tons of activated carbon per year. The chosen location – Gorj County (a traditional mining area) enjoys abundant local land-filled xylite. In a further stage, the project investigated ways to use the residual heat and refined the efficiency of the technical processes.

Turning this xylite into useful activated carbon leads to significant environmental benefits. These include:

- > A reduction of beech wood deforestation (50 hectares of wood are needed to produce 1,000 tons of activated carbon);

- > A further reduction of the greenhouse effect (1 ha wood consumes around 14 tons a year of carbon dioxide and generates approximately 15 tons of oxygen);
- > A limit to the use of a waste material, which adversely affects the combustion process in power plants;
- > Prevention of air and soil pollution by the powders (fly ash) resulting from the incomplete combustion of xylite at the power plants; and
- > A decrease of wood flour and other wastes produced by wood processing, which represent precious renewable raw materials in the process of activated carbon manufacturing.

Project Number:

LIFE02 ENV/RO/000461

Title: Activated carbon manufacturing using xylite...

Beneficiary: Metallurgical Research Institute - ICEM

Total Budget: €699,000

LIFE Contribution: €328,000

Period: 01-Jul-2002 to 30-Jun-2005

Website: <http://www.icem.ro/life1/SiteLife/index.html>

Contact: Georgeta Predeanu

Email: Gpredeanu@metal.icem.ro



Integrated Product Policy

The Commission's strategy on Integrated Product Policy (IPP) aims to reduce the environmental impact of goods and services at the most relevant stages of a product's life-cycle. The approach covers all issues related to a product, from its design and development, to the consumption of natural resources as raw materials, its manufacture, assembly and transport, its marketing and sale, its subsequent use and, finally, its recycling or disposal. An integrated approach for products implies involving many different actors and stakeholders along the product chain, aiming to improve the environmental performance of the product. As part of this process, IPP seeks to promote the coordination and exchange of information/knowledge between the relevant groups.

IPP strategy <http://ec.europa.eu/environment/ipp/>



ECON-tainer: new container plant at the Port of Rotterdam

The ECON-tainer project established a new container degassing and fumigation plant in Rotterdam with the aim of eliminating methyl bromide emissions. It successfully demonstrated four zero-emission techniques, two of which are economically viable.

The LIFE-supported project set up the world's first zero-emission container degassing and fumigation facility. The project was implemented by Europe Combined Terminals (ECT), which handles 60% of containers passing through the Port of Rotterdam, and aimed to demonstrate a new environmentally friendly technique for treating containers for pests.

ECON-tainer established four new techniques at its new container plant. In the start-up phase (2003-2004), it reduced emissions of methyl bromide, an odourless, colourless gas that is used to control several pests, in the Netherlands by approximately 15%. Methyl bromide is harmful to humans and a significant ozone-depleting substance.

Project Number:

LIFE02 ENV/NL/000124

Title: An environmental friendly cargo handling plant in the Port of Rotterdam

Beneficiary: Europe Combined Terminals, the Netherlands

Total Budget: €2,999,600

LIFE Contribution: €623,000

Period: 01-Mar-2002 to 31-Dec-2004

Website: www.rest.rotterdam.nl

Contact: Jan Nater

Email: jan.nater@ect.nl

The plant was completed at the end of 2002 and became operational at the beginning of 2003. Twelve new gas-tight chambers were built and equipped with the required heating, conditioning and monitoring installations, and four types of treatment were performed:

1. Treatment with the EcO2 QPS (Quarantine and pre-Shipment) heat treatment. This technique was developed to treat wood, and to stow wood materials and packaging materials together with their goods.
2. Gassing with methyl bromide in a controlled environment.
3. Treatment with EcO2 controlled atmosphere technology. This technique is mainly used for pest control purposes in food stocks.
4. Degassing containers with methyl bromide in a controlled environment.

Zero-emission techniques

All four zero-emission techniques used for gassing and degassing containers were technically feasible; the first two treatments were also economically viable. The results of the project have generated a lot of international interest, particularly in view of a recent regulation to cut down on methyl bromide emissions. Delegations from other European countries and North America visited the plant, and the ports of Antwerp, Felixstowe and Hamburg are considering setting up similar facilities.



New zero emission container facility at the Port of Rotterdam.

The Montreal Protocol calls for an end to the production of substances that deplete the ozone layer, and the new FAO-guideline for regulating wood packaging material in international trade, ISPM15, is expected to lead to an increase in the use of methyl bromide. The ECON-tainer project demonstrated that the EcO2 QPS heat treatment is a certified and acceptable alternative within ISPM15 for gassing with methyl bromide.

CLEAN DECO: Green coatings for taps

Galvanisation, used for example in chrome-plating of taps and other decorative components, is very polluting. It produces alkaline and acid emissions, polluted effluents and sludge. But there is a less-polluting alternative: physical vapour deposition (PVD), which has been used in industry for more than two decades. The CLEAN DECO project sought to demonstrate how PVD techniques could be applied to tap decoration processes.

PVD is a term covering a set of techniques that use a vacuum chamber to convert coating materials such as titanium or chromium into an ion vapour before coating surfaces with the vaporised material. The project beneficiary, based in Caselette, Turin, had the skills to apply PVD techniques through its specialist subsi Genta-Platit, which was able to offer thirty years' experience and relevant ISO certification.

The project aimed to show that PVD for decorative plating would generate both environmental benefits and be economically viable. With LIFE programme assistance, the beneficiary built a demonstration plant that it was hoped would reduce chromium content in wastewater and in toxic sludge; would lessen the reliance on chromium anhydride, a hazardous raw material; and would save both energy and water. In addition, Genta-Platit aimed to show that PVD techniques could produce better quality finishes compared to galvanisation, opening up market opportunities.

Less polluting and longer-lasting

The project achieved all of these goals. Three decorative coating colours were tested – gold, grey and anthracite – with similar characteristics in terms of look and shine to galvanised coatings.



However a major benefit was discovered in terms of durability of coated components. PVD coated taps were found to last three to four times longer than galvanised ones.

Environmental benefits were combined with cost benefits:

- > Raw material consumption decreased by 80%.
- > Basic wastes were reduced by 40%.
- > Chromium wastes were eliminated.
- > Considerably lower liquid volumes were required for the processes.
- > Use of hazardous chemicals was greatly reduced or even eliminated.

The success of the project ensured interest among other manufacturers, who asked to test their own tap components in the demonstration plant. European Union legislation discouraging use of dangerous substances such as chromium is also contributing to the interest in cleaner and more efficient techniques, which have the



PVD-coated taps can last 3-4 times longer than galvanised ones.

potential to be used for products such as jewellery, spectacles and tools. The technology is already being used commercially, with tap components produced using PVD available on the market.

Project Number:

LIFE00 ENV/IT/000213

Title: Development of clean coating technology pvd for decorative applications...

Beneficiary: Trattamenti Termici Ferioli & Gianotti S.p.A., Italy

Total Budget: €4,873,000

LIFE Contribution: €1,005,000

Period: 01-Sep-2001 to 31-Aug-2004

Website: <http://www.ferioliegianotti.it/>

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GPPnet: Networking to promote green public procurement

The GPPnet project promoted green public procurement (GPP) among Italian local authorities, providing them with a handbook to integrate environmental requirements into tendering procedures and with guidelines for developing GPP action plans.

Public authorities spend around 16% of the EU's gross domestic product. By using their purchasing power, they have the potential to not only improve their own environmental performance, but even to influence the market for 'greener' goods and services itself. GPP can cover areas such as energy-efficient computers, office stationary and furniture made of renewable or recycled materials, eco-labelled appliances, organic food for canteens, electricity from renewable energy sources, municipal vehicles that run on alternative fuels and environmentally certified suppliers.

Nevertheless, only a small minority of public organisations systematically consider environmental criteria when selecting suppliers, service providers and contractors. One of the main barriers to GPP is the lack of skills and information among public procurement officers for including environmental requirements into tendering procedures. The GPPnet project therefore aimed to provide public authorities with simple rules for their procurement decision-making and processes.

National network on GPP

The initiative involved the creation of a GPP network with the participation of the project beneficiary, the Provincial Administration of Cremona, and 13 municipalities seeking to improve their environmental performance and

thereby set an example to influence the behaviour of other organisations and individuals.

A 300-page handbook was published containing background information on GPP and describing its step-by-step introduction into a public administration's procedures. The publication includes a set of environmental criteria to be included in calls for tender, together with relevant procedural instructions and detailed form-sheets. The environmental specifications for 189 goods and service were compiled from 14 existing ecological labels and from guidelines established by national bodies such as the environment agencies in the United States and Denmark.

The handbook is an excellent instrument for public administrations seeking to introduce GPP and has been formally adopted by the local authorities involved in the project. Politicians and executives across all departments of the Province of Cremona were encouraged to promote its dissemination within their administrations. Suppliers and service providers were also kept informed of developments, in order to be able to comply with upcoming contract stipulations. All the public administrations involved prepared calls for tender in accordance with the GPP manual's recommendations, in sectors such as furniture, paper, office equipment, services and public works.

Based on the project's results, a national working group on GPP was established in Bologna in March 2005. The working group has been invited by the Ministry of the Environment to participate in the consultations for the drawing up of the National Plan on GPP. Under the auspices of the Italian Agenda 21 Coordination agency¹, it is expected that the results of the GPPnet project will be widely disseminated to local and provincial governments in Italy.

¹ ambiente@provincia.cremona.it



Project Number:

LIFE02 ENV/IT/000023

Title: GPPnet Green Public Procurement Network

Beneficiary: Amministrazione Provinciale di Cremona, Italy

Total Budget: €850,000

LIFE Contribution: €398,000

Period: 01-Dec-2002 to 30-Nov-2004

Website: www.compraverde.it

Contact: Pesaro Mara

Email: ambiente@provincia.cremona.it

Available LIFE publications

LIFE-Focus brochures

A number of LIFE publications are available on the LIFE website:

LIFE and European forests (2006 - 68pp. ISBN 92-79-02255-5 - ISSN 1725-5619) http://ec.europa.eu/environment/life/infoproducts/forests/forest_lr.pdf

LIFE in the City – Innovative solutions for Europe's urban environment (2006, 64pp. - ISBN 92-79-02254-7 - ISSN 1725-5619) http://ec.europa.eu/environment/life/infoproducts/urban/urban_lr.pdf

Integrated management of Natura 2000 sites (2005 - 48 pp. – ISBN 92-79-00388-7) http://ec.europa.eu/environment/life/infoproducts/managingnatura_highres.pdf

LIFE, Natura 2000 and the military (2005 - 86 pp. – ISBN 92-894-9213-9 – ISSN 1725-5619) http://ec.europa.eu/environment/life/infoproducts/lifeandmilitary_en.pdf

LIFE for birds - 25 years of the Birds Directive: the contribution of LIFE-Nature projects (2004 - 48 pp. – ISBN 92-894-7452-1 – ISSN 1725-5619) http://ec.europa.eu/environment/life/infoproducts/lifeforbirds_en.pdf

The air we breathe - LIFE and the European Union clean air policy (2004 - 32 pp. – ISBN 92-894-7899-3 – ISSN 1725-5619) http://ec.europa.eu/environment/life/infoproducts/focusair/lifeair_hr_en.pdf

LIFE-Nature: communicating with stakeholders and the general public - Best practice examples for Natura 2000 (2004 - 72 pp. – ISBN 92-894-7898-5 – ISSN 1725-5619) http://ec.europa.eu/environment/life/infoproducts/naturecommunicating_lowres_en.pdf

A cleaner, greener Europe - LIFE and the European Union waste policy (2004 - 28 pp. – ISBN 92-894-6018-0 – ISSN 1725-5619) http://ec.europa.eu/environment/life/infoproducts/lifewaste_en.pdf

Alien species and nature conservation in the EU - The role of the LIFE programme (2004 - 56 pp. – ISBN 92-894-6022-9 – ISSN 1725-5619) http://ec.europa.eu/environment/life/infoproducts/alienspecies_en.pdf

Industrial pollution, European solutions: clean technologies - LIFE and the Directive on integrated pollution prevention and control (IPPC Directive) (2003 - 32 pp. – ISBN 92-894-6020-2 – ISSN 1725-5619) http://ec.europa.eu/environment/life/infoproducts/cleantechnologies_en.pdf

LIFE and agri-environment supporting Natura 2000 - Experience from the LIFE programme (2003 - 72 pp. – ISBN 92-894-6023-7 – ISSN N° 1725-5619) http://ec.europa.eu/environment/life/infoproducts/agrienvironmentreport_en.pdf

LIFE for Natura 2000 - 10 years implementing the regulation (2003 - 108 pp. – ISBN 92-894-4337-5) http://ec.europa.eu/environment/life/infoproducts/lifepournatura2000_en.pdf

A sustainable approach for the environment - LIFE and the Community Eco-Management and Audit Scheme (EMAS) (2003 - 32 pp. – ISBN 92-894-0543-0) http://ec.europa.eu/environment/life/infoproducts/emas_en.pdf

Water, an essential resource - LIFE and the new European water policy (2002 - 28 pp. – ISBN 92-894-0538-4) http://ec.europa.eu/environment/life/infoproducts/water_en.pdf

A number of printed copies of certain LIFE publications are available and can be ordered free-of-charge at: <http://ec.europa.eu/environment/env-informa/>

Other publications

Best LIFE-Environment Projects 2004-2005 (2005, 44 pp. – ISBN 92-79-00889-7) <http://ec.europa.eu/environment/life/infoproducts/bestlifeenv/bestenv.pdf>

LIFE-Environment 1992 – 2004 “Demonstrating excellence in environmental innovation” (2005, 124 pp. – ISBN 92-894-7699-3 – ISSN 1725-5619) http://ec.europa.eu/environment/life/infoproducts/bilanlife/lifeenv1992_2004_en.pdf

LIFE-Environment in Action. 56 new success stories for Europe's environment (2001 -131 pp. – ISBN 92-894-0272-5) http://ec.europa.eu/environment/life/infoproducts/successstories2001_en.pdf

LIFE-Environment Projects 2006 compilation (2006, 56 pp.-ISBN 92-79-02786-7) http://ec.europa.eu/environment/life/infoproducts/lifeenvcompilation_06.pdf

LIFE-Nature Projects 2006 compilation (2006, 67 pp. – ISBN 92-79-02788-3) http://ec.europa.eu/environment/life/infoproducts/lifenatcompilation_06.pdf

LIFE-Third Countries Projects 2006 compilation (2006, 20 pp. – ISBN 92-79-02787-5) http://ec.europa.eu/environment/life/infoproducts/lifetcycompilation_06.pdf

LIFE-Environment Projects 2005 compilation (2005, 97 pp.-ISBN 92-79-00104-3) http://ec.europa.eu/environment/life/infoproducts/lifeenvcompilation_05_lowres.pdf

LIFE-Nature Projects 2005 compilation (2005, 55 pp. – ISBN 92-79-00102-7) http://ec.europa.eu/environment/life/infoproducts/lifenatcompilation_05_lowres.pdf

LIFE-Third Countries Projects 2005 compilation (2005, 19 pp. – ISBN 92-79-00103-5) http://ec.europa.eu/environment/life/infoproducts/lifetcycompilation_05_lowres.pdf

Name LIFE ("L'Instrument Financier pour l'Environnement" / The financial instrument for the environment)

Type of intervention co-financing of actions in favour of the environment in the twenty-five Member States of the European Union, in the candidate countries who are associated to LIFE and in certain third countries bordering the Mediterranean and the Baltic Sea.

LIFE is made up of three thematic components: "LIFE-Nature", "LIFE-Environment" and "LIFE-Third countries".

Objectives

- > with a view to sustainable development in the European Union, contribute to the drawing up, implementation and updating of Community policy and legislation in the area of the environment;
- > explore new solutions to environmental problems on a Community scale.

Beneficiaries any natural or legal person, provided that the projects financed meet the following general criteria:

- > they are of Community interest and make a significant contribution to the general objectives;
- > they are carried out by technically and financially sound participants;
- > they are feasible in terms of technical proposals, timetable, budget and value for money.

Types of project

- > Eligible for LIFE-Environment are innovative pilot and demonstration projects which bring environment-related and sustainable development considerations together in land management, which promote sustainable water and waste management or which minimise the environmental impact of economic activities, products and services. LIFE-Environment also finances preparatory projects aiming at the development or updating of Community environmental actions, instruments, legislation or policies.
- > Eligible for LIFE-Nature are nature conservation projects which contribute to maintaining or restoring natural habitats and/or populations of species in a favourable state of conservation within the meaning of the "Birds" (79/409/EEC) and "Habitats" (92/43/EEC) Community Directives and which contribute to the establishment of the European network of protected areas – NATURA 2000. LIFE-Nature also finances "co-op" projects aiming to develop the exchange of experiences between projects.
- > Eligible for LIFE-Third countries are projects which contribute to the establishment of capacities and administrative structures needed in the environmental sector and in the development of environmental policy and action programmes in some countries bordering the Mediterranean and the Baltic Sea.

Implementation National authorities in the Member States or third countries send the Commission the proposals of projects to be co-financed (for LIFE-Environment preparatory projects, the applicants send their proposals directly to the Commission). The Commission sets the date for sending the proposals annually. It monitors the projects financed and supports the dissemination of their results. Accompanying measures enable the projects to be monitored on the ground.

Period covered (LIFE III) 2000-2006.

Funds from the Community approximately EUR 638 million for 2000-2004 and EUR 317 million for 2005-2006.

Contact

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