



LIFE III

focus



LIFE-Environment 1992-2004

*"Demonstrating excellence
in environmental innovation"*



European Commission



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LIFE UNIT
The team



In 1992 when the LIFE Programme was launched, the general public was becoming increasingly aware of the pressures that modern-day living were placing on our environment. It was also becoming clear that environmental problems were extremely diverse and therefore required tailored solutions. This was precisely where the LIFE programme stepped in – offering actions and solutions that would be complementary to those already undertaken by the European Commission, notably on the legislative front.

Between 1992 and 2004, LIFE-Environment funded over 1,400 projects across all the Member States, for a total investment of EUR 2.286 Billion with an average Community contribution of 30%. This means that one euro invested at European level has leveraged two or more euros from private and/or other public contributions. After 12 years of the LIFE-Environment Programme, the European Commission's LIFE Unit Team felt that the time was ripe for an assessment of the programme's achievements. The following chapters summarise this work.

Under LIFE I and II, the dissemination of the results of LIFE-Environment projects was mostly undertaken by the 'beneficiaries', or project promoters. As a result, these projects were generally only known individually, via their own dissemination efforts. However, an external evaluation of the LIFE programme pointed to a need for a better integration of these results: that the success of LIFE should not only be assessed according to the results of individual projects, but also through the overall effect of those projects on a sector-by-sector basis. Furthermore, the study indicated that there was a need for more transparency and that the Commission could better communicate the use of the public money that it was managing on behalf of the European taxpayer.

To rise to this challenge, in recent years, the Commission has developed various analytical and dissemination tools, so that it is now possible to capitalise better and to draw some key general conclusions on the LIFE-Environment project results. The main aim of this publication is to highlight some of these results and to draw some preliminary conclusions. This consolidation of project results shows the positive role that the LIFE instrument has played in various environmental fields – helping to contribute to the development of innovative technologies, to methodologies and tools and to raising public awareness in Europe of environmental issues.

The DG Environment LIFE Unit Team is charged with the selection of the best project proposals on an annual basis, and with the monitoring and support of project development and finances. Here we must pay here tribute to the individual projects and to the dedication of the many partners who have accepted to work closely with the Commission and contributed in their fields, to the improvement of our common environment.

Bruno Julien
Former Head of LIFE Unit



summary

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Introduction

Since its launch in 1992, from LIFE I through to LIFE III in 2004, the European Commission has been implementing a programme that aimed to be, and still is, the financial instrument for the implementation of EU environmental policy. Its mission in particular, has been to fulfil the goals defined within the Fifth and then the Sixth Community Environmental Action Programmes¹.



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Reflecting the need for this more integrated instrument for funding projects, the successful programme has been prolonged and adapted three times: LIFE II (1996-1999), LIFE III (2000-2004) and the extension of LIFE III for a further two years of funding (2005-2006). Over the 12-year period, the LIFE-Environment programme has taken on board candidate countries and new Member States, starting with 13 Member States and now encompassing the current 25 Member States, plus one candidate country, thus extending widely its geographical scope.

The LIFE programme has co-funded over 1,400 LIFE-Environment projects in various sectors tackling many environmental issues, developing methods and tools, new cleaner technologies and helping to make the public and decision makers more aware and therefore concerned about sustainable development.

This publication aims to present the impressive sum of achievements and work undertaken by LIFE-Environment actors in a relatively short period of time (in environmental terms).

Given the diversity and multiplicity of environmental themes covered by the LIFE-Environment programme, it is difficult to make a comprehensive evaluation. Although some general figures and results are highlighted, it is important to consider projects on an individual basis and to examine the extent to which they have contributed to environmental improvements. This is one of the reasons a strong and relevant dissemination of project progress and results, for each individual project, is such an important part of the programme.

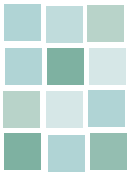
For more information on all the closed and on-going projects, visit the database of projects from the LIFE website at: <http://europa.eu.int/comm/environment/life/>

European Flower Week-Campaign on the EU Eco-label.

In **Chapter 2**, a brief history and highlights of the LIFE programme will provide an overview of the programme and present some key moments.

Chapter 3 will identify the main actors of LIFE: the project holders, or so-called 'beneficiaries'. This will focus on the level of involvement of each main working sector of the LIFE I to III programme (public, private and mixed), and will examine the generic themes into which they have put their efforts.

¹ The Fifth EC Environmental Action Programme [OJ L 275 of 10/10/1998]; the Sixth EC Environmental Action Programme [OJ L 242 of 10/9/2002]



Before entering the most substantial part of the brochure (Chapter 4) general data on funding and numbers of projects and their distribution will be presented.

Chapter 4 illustrates the main LIFE general themes providing detailed information on: land-use development and planning, water management, environmental impact of economic activities, waste management and integrated product policy. In addition to this standard classification according to the usual thematic group categories, a secondary approach has been included to provide another layer of classification. Projects have also been identified by their main type of activity e.g. “technology-oriented projects”, “methods-oriented projects” and “awareness-raising and participatory” projects.

Throughout the thematic sections reference is made to the 5th and 6th EAP, which take a wide-ranging approach and provide a strategic direction, to the Commission’s environmental policy over the next decade as the Community prepares to expand its boundaries.

For each of these themes, we have considered three main questions:

- > “**What field are we in?**” provides the background to each of the thematic sections and examines the specific environmental issues within that field. This information is supported by key facts and figures from the LIFE database and the LIFE Unit, as well as pertinent data from recent European Environment Agency (EEA) publications.
- > “**How was LIFE funding allocated?**” will be answered by tables and figures outlining the distribution of funding and number of projects for each generic sub-theme.
- > “**What were the main impacts of the LIFE programme?**” As the brochure aims to provide an assessment of LIFE’s contribution to our environment, this question is answered wherever possible, with quantifiable data. Successful projects, reflecting the pan-European spread of the

LIFE-Environment programme, and the range and type of beneficiaries, are presented to illustrate these assertions. Many of these selected projects have been followed up with recent ex-post evaluations, to ensure the latest available news of their progress and to ensure that they have indeed provided a life after LIFE, in complying with sustainability criteria. It is important to highlight that these are all examples of the way LIFE has contributed to innovation, but that there are many other successful examples to choose from. (See the LIFE homepage link on p.3).

Chapter 5 is the logical next step: following the thematic insight chapter it addresses several horizontal issues. Notably, these sections will:

- > Examine increasing evidence that LIFE-Environment is acknowledged as a “programme of international excellence”.
- > Look at the important innovative aspect of the programme – and in particular its capacity to support innovative environmental ideas, at the right time, so that they were able to go on and become successful. These sustainable projects have both positive economic and environmental impacts and can be considered as ‘win-win projects’.

> Show that LIFE is above all a financial instrument that fills a gap in the innovation chain, where the public and private sectors are usually absent. R&D projects are usually followed by a real scale demonstration phase which if successful will then attract financial investors for the marketing phase. This demonstration phase does not attract investors in that field and therefore LIFE has played a crucial role during the last 12 years.

- > Look at the important impact of LIFE in providing long-lasting, sustainable, local environmental success.
- > Highlight that LIFE has also always paid attention to the importance of integrating a good deal of information dissemination through the project promoters themselves, or through EC staff direct actions. The Information society has evolved rapidly since the start of LIFE in 1992, and LIFE has adapted itself to this (r)evolution by developing its information needs and requirements.

To conclude, **chapter 6** will summarise the achievements and main outcomes of the LIFE programme over the past 12 years.

*Wise Use of Floodplains:
see chapter 4 for land-use
development and planning projects
for specific areas e.g. wetlands.*

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The LIFE Programme – a brief history of EU environmental financing

During the late 1980s, public awareness of environmental threats grew rapidly. Large scale environmental disasters such as the Chernobyl catastrophe focused attention on the need for higher levels of environmental protection. Issues such as the holes in the ozone layer over the poles and global warming prompted acceleration in European environmental policy-making and institution-building.

The LIFE Programme

After several smaller initiatives at European level, a decision was made to create a more integrated instrument for financing environmental projects. LIFE I (Council Regulation 1973/92¹) was born, a new, all-encompassing programme with an initial budget of ECU 400 million.

During its first phase, LIFE had a number of components:

- > Promotion of sustainable development and quality of the environment (new monitoring techniques, clean technologies, waste disposal, restoring contaminated sites, land-use planning and management, aquatic pollution, urban environment) – indicative allocation: 40% of the programme budget
- > Protection of habitats and of nature (protecting endangered species and threatened habitats: combating desertification, erosion, etc.; marine conservation; freshwater conservation) – indicative allocation: 45% of the programme budget
- > Administrative structures and environment services (cooperation and network development) – indicative allocation: 5% of the programme budget
- > Education, training and information (professional training, environmental education and understanding, dissemination) – indicative allocation: 5% of the programme budget
- > Actions outside Community territory (third country assistance) – indicative allocation: 5% of the programme budget



The rates of Community assistance for projects ranged from 30% for income-generating investments to 100% for technical assistance measures. For most projects in the first two categories described above, the level of assistance was limited to 50% of project cost. These rates of assistance remained in place for subsequent phases of the programme.

Detailed priorities were set each year. For example, in 1993, the sustainable development and quality of the environment component of LIFE I focused on projects relating to the textile, tannery, paper and agro-food industries; waste reduction and recycling demonstration projects; decontamination of polluted sites; sustainable development in agriculture, transport and tourism; urban transport; and modernisation of environmental monitoring networks.

LIFE promoting long-lasting consumption patterns.

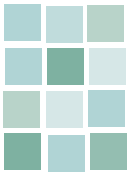
LIFE II (1996 – 1999)

The first phase of LIFE was succeeded by LIFE II, also running for four years but with an increased budget of ECU 450 million, covering an enlarged EU (Austria, Finland and Sweden joined in 1995). During LIFE II, the split of the programme into three categories – LIFE-Nature, LIFE-Environment and LIFE-Third countries – was completed.

The Regulation amending the previous Regulation that had established LIFE I² stated that 46% of the programme

¹ OJ L 206 of 22.07.1992

² Regulation (EC) No 1404/96, amending ibid OJ L 181 of 20.07.1996 p. 0001 - 0005



budget should be dedicated to nature conservation actions – the programme strand that became LIFE-Nature. A further 46% was dedicated to 'other actions designed to implement Community environmental policy and legislation.'³ This strand of the programme became LIFE-Environment.

A third strand (5% of the budget) addressed actions in Mediterranean and Baltic Sea countries – later LIFE-Third countries – and accompanying and technical assistance measures (3% of the budget).

The scope of the restructured programme was broad. **LIFE-Environment** projects had to contribute to innovation or policy implementation in the fields of environmental monitoring, clean technologies, waste management, the identification and rehabilitation of contaminated sites, the integration of environmental concerns in town and country planning, aquatic pollution reduction and the improvement of the urban environment.

The objective was to demonstrate new methods and techniques that would have the potential for pan-European application and would pave the way for implementation of existing policies in different environmental fields, or for the future development of policy.

LIFE-Nature meanwhile sets out specifically to contribute to the implementation of the Birds and Habitats Directives, in particular the Natura 2000 network, which promotes the conservation of natural habitats and the habitats of wild fauna and flora while taking into account the economic, social and cultural requirements and specific regional and local characteristics of each Member State.

Nature conservation projects that contribute to maintaining or restoring natural habitats and/or species populations to a favourable conservation status within the meaning of the Habitats Directive are eligible for financial support. Projects must concern Special Protection Areas or Sites of Community Importance and the species listed in the Directives.

Examples of actions supported include protection of wolves, bears and bats in Italy, restoration of coastal meadows and wetlands on Baltic Sea islands, and removal of non-native species such as American mink in the Scottish Hebrides.

The objective of **LIFE-Third countries** is to contribute to the development of environmental policy and action programmes in the applicable countries. Projects must be of interest to the Community, promote sustainable development and provide solutions to major environmental problems.

As LIFE II came to a close in 1999, participation was opened to EU accession countries. The first to get involved was Romania, followed by Slovenia, Hungary, Estonia, Latvia and Slovakia. In June 1999, 'LIFE week' was held, to bring together those involved in LIFE projects. This was a one-off event but was considered a success and led to the European Commission establishing an annual 'Green Week' in Brussels.

An independent evaluation of the LIFE programme, carried out by consultants Arthur Andersen in 1998, concluded that LIFE had become an 'important' element of European environmental policy and contributed to the promotion of sustainable development across the continent, to 'innovation in industries relating to waste, water and air,' and to innovation in the operations of local authorities.

Furthermore, the evaluation found that LIFE 'helped introduce a participatory approach', reinforced information sharing and empowered civil society, improved the state of European waters and contributed to the prudent and rational use of natural resources.

LIFE III (2000-2004) and the extension of LIFE III until the end of 2006

The third phase of the LIFE programme ran for a five year period, though it was implemented in four rounds due to late adoption of the legal base. Its budget was increased to EUR 640 million.

In September 2004 with the publication of Regulation (EC) No 1682/2004⁴, LIFE III was extended for a further two years (2005 and 2006), with an additional budget of EUR 317 million. The intention of the extension was to avoid a legal gap between the close of LIFE III at the end of 2004, and the adoption of new Community financial perspectives in 2007⁵.

In total, between 1992 and 2004, the different strands of the LIFE programme made commitments of EUR 1.3 billion on almost 2,500⁶ projects covering 40 countries and territories. The total estimated cost of projects to which LIFE contributed financially from 1992-2004 was EUR 3.6 billion. LIFE therefore provided around 36% of the total investment, stimulating additional investment in excess of EUR 2 billion up to the end of 2004.

Finally, an independent evaluation of the LIFE programme was carried out in 2003 by AEA Technology plc (AEAT). The evaluation concentrated on LIFE II, as when it was carried out few LIFE III projects had been completed. AEAT found that LIFE-Environment had demonstrated and proven a variety of clean technologies in key areas, such as improving water quality and recycling waste. It was also noted that Member States valued the programme, feeling that it complemented and filled the gaps in national programmes. However, the report did highlight some areas of concern, notably in the areas of 'preparatory actions' and in dissemination (see also chapter 5, section 5.1). These shortcomings have, and are being addressed under LIFE III onwards – as is the nature of an evolutive programme such as LIFE.

³ Regulation (EC) No 1404/96

⁴ OJ L 305 of 5.10.2004, p.1

⁵ European Parliament Legislative Observatory

⁶ Figures supplied by EC Life Unit 25-04-2005

Participants in LIFE: Useful facts & figures

Identifying the main actors of LIFE: the project promoters, or so-called 'beneficiaries', this chapter focuses on the level of involvement of each main working sector of the LIFE I to III programme; and examines the generic themes into which they have put their efforts.

CleanMag team (LIFE99 ENV/GR/000567) meet members of the LIFE Monitoring Team and the LIFE Unit.



3.1 Over 1,200 'beneficiaries', or project promoters, benefited from LIFE-Environment co-funding

From LIFE I to LIFE III in 2004, 1,404 LIFE-Environment projects have been co-funded by the European Commission. A total of 1,279 different project promoters – known as 'beneficiaries' (main contracting party with the EC) – have benefited from support. Some beneficiaries have had several projects selected. Leading the field in this respect is ADEME, the French Agency for the Environment and Energy Control (Agence de l'Environnement et de la Maîtrise de l'Energie), which has implemented seven successful projects.

3.2 LIFE beneficiaries normally work in 'partnerships' to implement projects

Beneficiaries normally work in partnerships with other parties, who bring their own 'know-how' and capabilities to the projects: project partners, technical assistance, subcontractors. The LIFE programme database of partnership information from some 400 running projects, indicates that a total of 279 partners were from

outside their home country. The LIFE-Environment programme strongly encourages EU co-operation implementing selection criteria that reward EU-wide partnerships. **LIFE has therefore benefited a large number of organisations and many more stakeholders, and has strengthened EU cooperation.**



3.3 Public and private sectors work hand-in-hand in implementing LIFE-Environment projects

Although some projects are run by private or public stakeholders working alone, most projects involve a mix of partners from the private and public sectors.

Public or private universities and research institutes often advise the industrial sector, or are the place where, for example a prototype is tested. Cities and regions often require the services of consultants. LIFE projects offer ongoing, fruitful collaboration between the private and public sectors.

3.4 Private and public-sector beneficiaries are equally represented in the LIFE-Environment programme

As shown in the following table, private and public sectors are equally represented in the programme.

The mixed sector includes public companies, universities and research institutions. For these two last categories, the data does not show whether the beneficiary is private, public or both, therefore they have been integrated into a 'mixed category'.

Type of beneficiaries along LIFE: main sectors: Public-Mixed-Private



Figure 1. LIFE-ENV beneficiaries 1992-2004 by main sectors – public, public/private, private.

Public sector beneficiary Graz department of Environment steered this successful project. (LIFE00 ENV/A/000240)



3.5 LIFE-Environment beneficiaries come from many different sectors

Reflecting the variety of environmental issues and problems to be tackled in our modern industrial and leisure worlds, LIFE-Environment beneficiaries come from a wide variety of sectors. These include: international and national NGOs (REC, Royal Society for the Protection of Birds, WWF); renown international groups (Airbus, BASF, Cargill, Du Pont de Nemours, Elf, Fuji Film, General Electrics, KLM, Peugeot, Philips, Rank Xerox, Rhone Poulenc, Siemens, SmithKline Beecham...);

lesser known companies; capitals (Athens, Brussels, Copenhagen, Dublin, Ljubljana, London, Vienna...); cities (Barcelona, Florence, Graz, Lyon, Rotterdam, Tampere, Thessalonica...); regions (Abruzzi, Aquitaine, Emile Romagna, Rioja...); local authorities in urban or rural areas, port authorities (Antwerp, Le Havre, Livourne, Rotterdam, Valencia), universities, hospitals, research institutes, national authorities (mainly environmental ones); insurance companies; and professional sector associations.

Industrial participants have come from a range of sectors: agro food, chemicals, construction, high-tech (e.g. semi-conductors), leather, paper, pharmaceuticals, printing, textile, plastic, steel, vehicles and their components, transport, petroleum, mining, energy, renewable energy etc.

3.6 SMEs, international enterprises and local authorities make up the greatest proportion of LIFE beneficiaries

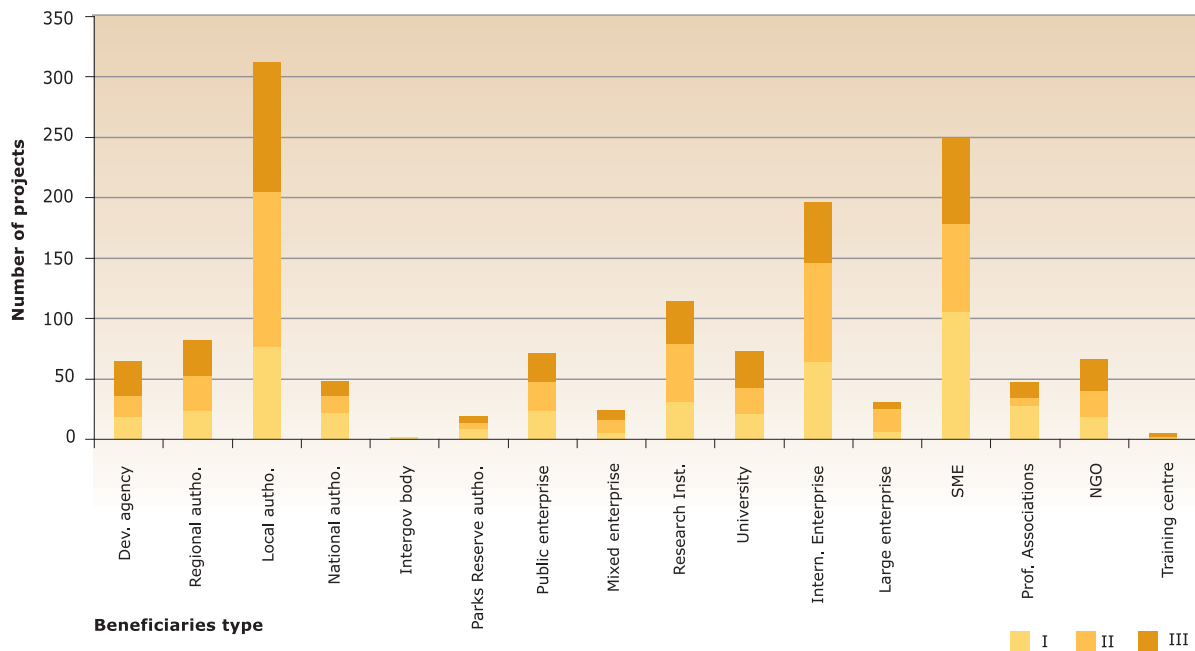
SMEs, international enterprises and local authorities together account for 54% of the projects and respectively 18%, 14% and 22%. Research institutes are next with 8%.

Distribution of LIFE beneficiaries in percentages per policy group.

	Public	Mixed	Private
Land Use Development and Planning	70,2	12,1	16,7
Water Management	45,8	17,4	36,8
Impact of Economic Activities - Industrial Processes	26,1	15,9	58,0
Waste Management	33,1	14,7	52,3
Life Cycle Management - integrated Product Policy Environmentally Sound Consumption	46,8	15,1	38,1

Figure 2. Number of LIFE-ENV projects 1992-2004 by type of beneficiary.

Type of beneficiaries in LIFE: main sectors: Public-Mixed-Private



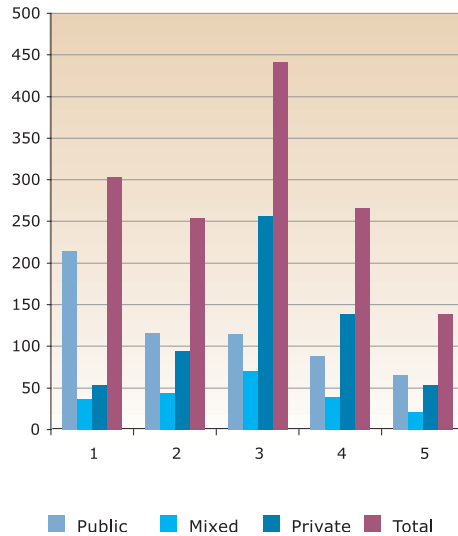


3.7 Different sectors have different interests in relation to LIFE Generic Themes (Policy Groups)

Further analysis shows that the private and public sectors' main interests diverge when it comes to the main LIFE policy groups, although they are both present in all the policy groups. PG 1: 'Land-use development and planning' is mainly dealt by regional and local authorities, while PG 3: 'Impact of economic activities and industrial process' is a matter managed by private companies: SMEs, international and large national companies.

Therefore, the private sector's main focus is on PG 3 and 4, while the public sector concentrates on PG 1 is also represented strongly in PG 2 and 5. The mixed category has a rather constant involvement in all PGs, which is logical because of the nature of their activities.

Distribution of projects per Policy Group



3.8 Beneficiary distribution evened out from LIFE I to LIFE III

As the final table show, the private sector 'did better' under LIFE I but the public sector caught up under LIFE II and III.

Figure 3. Number of LIFE-ENV projects 1992-2004 by different sectors: public, public/private, private.

Beneficiaries distribution main sectors: Public-Mixed-Private

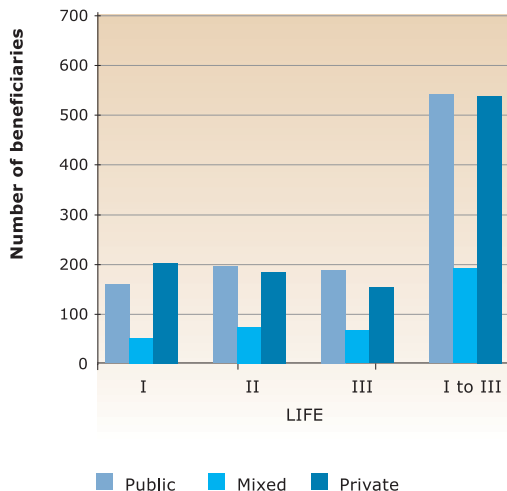


Figure 4. Number of LIFE-ENV beneficiaries 1992-2004 by main sectors – public, public/private, private.

LIFE-Environment main themes

During its 12 years of existence, the LIFE-Environment programme has supported a wide variety of projects, tackling problems and developing solutions across a number of sectors. LIFE has addressed most key environmental issues, in line with EU environmental policy priorities.



Water and its management accounted for 254 LIFE-Environment projects 1992 - 2004.

The following classification provides an overview of the range of projects covered by these sections:

1. Land-use development and planning (304 projects)
2. Water management (254 projects)
3. Impact of economic activities – Industrial processes (441 projects)
4. Waste management (266 projects)
5. Integrated Product Policy – Life Cycle Management – Environmentally sound consumption (139 projects)

Both in terms of number of projects and of budget (Fig. 5), around one third of the projects supported by LIFE invested in reducing the impact of economic activities and of improving industrial processes through clean technologies, environmental manage-

ment, risk management and restoration measures. Around one fifth of the projects concerned land-use planning, improvement of the urban environment, water management or waste management.

Proportion of projects by theme

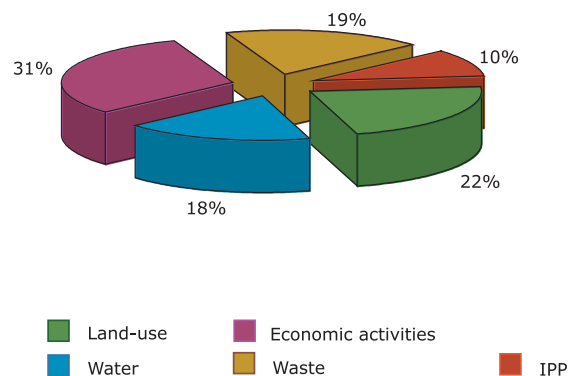
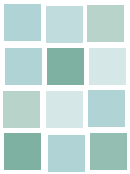
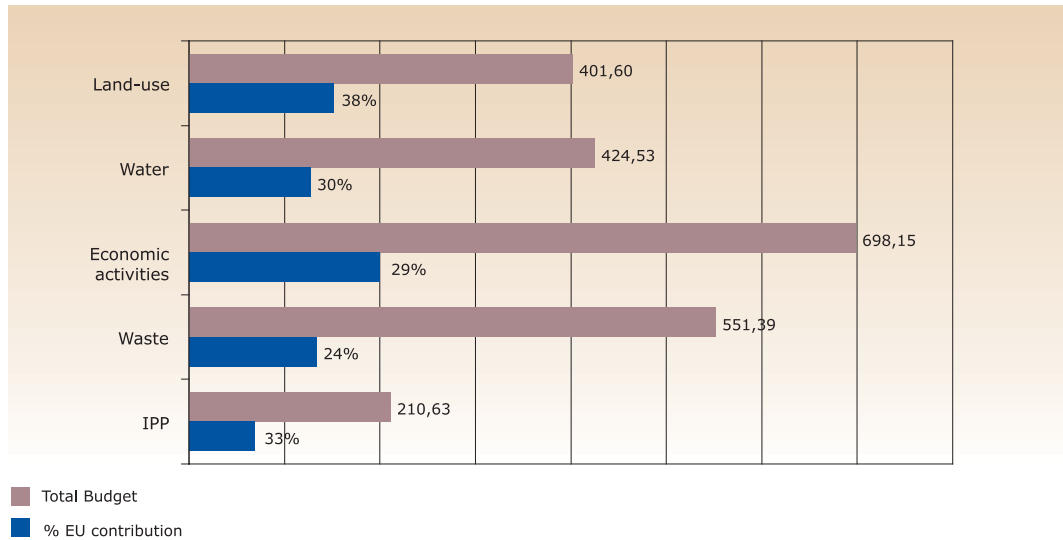


Figure 5. Percentage of LIFE-ENV projects 1992-2004 devoted to each thematic category.



LIFE-Environment Budget (in EUR Million and in % of total)



The total budget invested over 12 years is EUR 2.286 Billion, with an average EU contribution of 30%. As (Fig. 6) shows, this contribution was proportionally largest for the themes where non-material aspects are more present, (such as land-use planning) and in emerging sectors such as IPP (see also Fig. 8). There is no immediate return on investment for these kinds of projects, and therefore it is difficult to find financiers aside from the LIFE instrument.

Analysing the trends of the projects as a whole, it appeared that LIFE beneficiaries developed three approaches in addressing the environmental issues in their sector of concern. Although many projects combine several approaches, they usually focus on one specific area e.g. technologies, methods and tools, or awareness raising and participation.

1. Technology-oriented projects

LIFE-supported projects have contributed to the improvement of production processes in order to minimize the impact of industrial activities on the environment and to strengthen business competitiveness.

LIFE has also supported the development of a global approach to product design and better management of raw material flows, throughout the product lifecycle.

In terms of downstream processes, technologies and techniques have been developed for pollution treatment, remediation and decontamination.

More specifically, projects have dealt with:

- > Clean technologies: elimination of polluting components or substances, treatment of waste and effluents, reduction of waste production, water and energy consumption;
- > Waste treatment, pollution remediation and decontamination techniques;

Figure 6. Total budget invested

- > Creation of new products or technological processes, based on IPP and Life Cycle Management: green building, eco-design, alternative products;
- > Technology transfer and application of results from other sectors; and
- > Building and testing of prototypes.

During the three phases of the programme, technology projects represented on average 47% of the total number of projects and 60% of the total budget invested.

2. Methods-oriented projects

A further 45% of projects, representing 36% of the total budget, were involved in the design or application of new methodologies and tools.

They defined and implemented development plans and restoration measures.

They added significantly to the armoury of environmental tools helping companies and local authorities by the following:

- > Assessing the local environmental situation through surveys, enquiries, inventories etc.;
- > Planning sustainable development strategies;
- > Integrating environmental measures and policies; and
- > Implementing environmental management schemes, quality charters and certifications (such as ISO 14000, EMAS and Eco-label);

In supporting to these actions, a wide range of tools were developed including:

- > Decision-making support for analysis, modelling, planning, forecasts etc.;
- > Monitoring devices, sets of indicators, assessment procedures;
- > Information systems, networks and online services; and
- > Support and information material such as guidelines, manuals and good practices.

Tailored environmental training schemes, the construction of excellence centres and the creation of new jobs facilitated the transfer of new knowledge, shared know-how and increased capabilities.

3. Awareness-raising and participatory projects

Eight percent of the projects focussed on social processes, targeting either the public or professional sectors, with the aim of increasing understanding of environmental issues and changing citizens' attitudes and behaviour. This represents a financial investment of 4% of the total budget. This included:

- > Initiating public awareness campaigns targeting local populations;
- > Informing and raising awareness in specific sectors about environmental risks and opportunities;
- > Stimulating democratic procedures based on Agenda 21¹ participation, informal negotiation, consensus building and conflict management; and
- > Promoting co-operation between different stakeholders to share experience, build alliances and develop common strategies.

These projects developed an extensive range of information and communication materials.

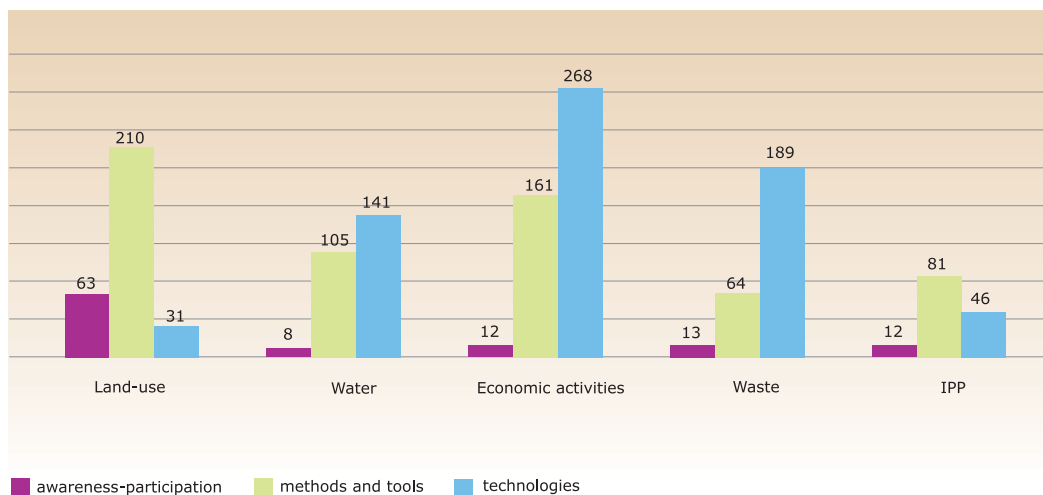
Link between the themes and chosen approach

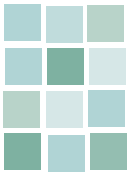
As (Fig. 7) shows, some approaches are more related to specific topics than others. For example, participatory and awareness raising approaches have proved particularly relevant for territorial projects about land-use planning and urban environment, but were seldom used in other thematic areas. Tools and methods were developed predominantly in land-use planning and IPP. Technologies were more closely linked with economic activities, waste and water.

¹ Agenda 21 as it emerged from Rio, calls for local authorities to adopt by 1996, a local Agenda 21 focusing on sustainable development strategies at the local level. The agenda should involve partnerships with all sectors of the local community and propose a variety of tools and approaches.

Figure 7. Number of LIFE-ENV projects for each thematic category by specific approach – awareness-participation, methods and tools, technologies.

Approaches by theme





Over time, the proportion of projects involved in each theme and each approach altered, but the main trends remained the same. As (Fig. 8) shows, the main differences are in land-use which decreased, while IPP was taken up. The same proportion of each approaches was dedicated in LIFE I and III, but the importance of technologies and of awareness projects was more important in LIFE II.

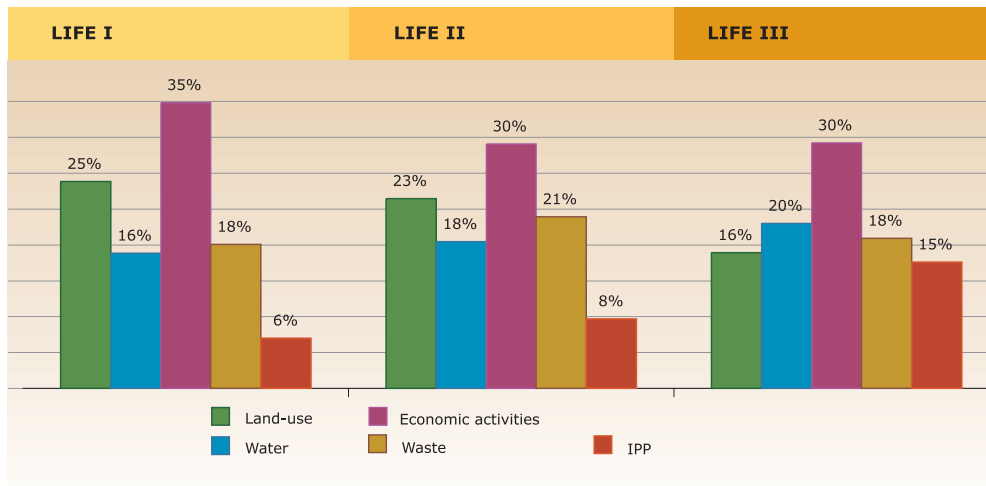
Figure 8. Chronological overview of LIFE-ENV projects 1992-2004, by themes and by different approaches - in percentages.

On considering competitiveness, and specifically the Commission's Communication on ETAP (Environmental Technologies Action Plan)², one usually thinks more in terms of technology-oriented initiatives than in methods-oriented ones. But, it is important to note that aside from technological innovation, a significant number of environmental improvements actually derive from methods and awareness-raising, or participatory activities. It is important to emphasize that many LIFE-Environment projects concentrated on these less commercial fields, where there is nevertheless a real need.

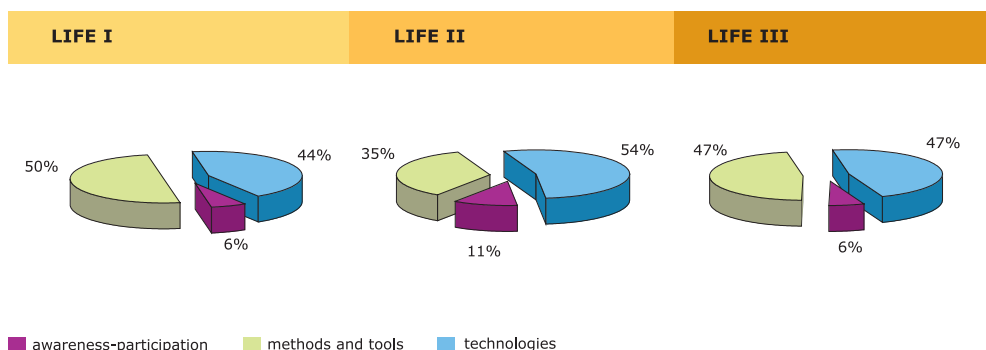
Finally, as the LIFE project results' show, and the following thematic sections illustrate: the multiplier effect of LIFE projects has been significant - as requirements of environmental relevance, a capacity to reproduce or implement the results elsewhere, and dissemination are key requirements of the programme and have been consistently applied.

² COM/2004/0038 final: Communication from the Commission to the Council and the European Parliament - stimulating Technologies for Sustainable Development.

LIFE-Environment projects 1992-2004 by themes



LIFE-Environment projects 1992-2004 by different approach



4.1: Land-use development and planning projects

1. What field are we in?

With an average of 113.95 people living on each of the EU-25's 3.93 million square kilometres it is easy to see why land-use planning and management is such an important environmental issue for the Union. The way we use our land space can have major impacts on environmental conditions. These can be direct, such as the destruction of natural habitats and landscapes, or indirect, such as increasing the amount of traffic on our roads leading to more congestion, air pollution and greenhouse gases.

Land-use planning and management decisions are usually made at local or regional level. However, the European Commission has a role to play in ensuring Member States take environmental concerns into account when putting together their land use development plans.

The Commission has four major goals in this area. These are to:

1. Devise methods and environmental tools to analyse the impact of proposed development.
2. Improve the information flow between policy-makers and citizens about land-use issues.
3. Develop and implement a European urban environment strategy.
4. Improve the planning, management and use of Europe's coastal zones – often the most vulnerable area.

[Source: DG Environment website]

Beyond these, other areas of EU intervention are important for the planning of Europe's land space, but are undertaken mostly within the scope of the Structural Funds. These include the following:

- > Regional development within the framework of ERDF (European Regional development Fund).
- > The development of rural areas, which is undertaken in the frame-

work of the Rural Development Regulation and the LEADER (Links between Actions for the Development of Rural Areas) Initiative, using EAG-GF (the European Agricultural Guidance and Guarantee Fund).

- > Urban regeneration, in the framework of the URBAN II Initiative with ERDF.
- > The European Spatial Development Perspective (ESDP) overall exercise of planning of European land, undertaken in the framework of The European Spatial Planning Observatory Network (ESPON), also with ERDF funding.

The initiatives taken in the framework of LIFE-Environment can be considered as complementary to the policies mentioned above. Either they explore areas that are left untouched by the mainstream programmes, or they act as innovators, preparing the ground for the mainstream programmes.

Five fields are included under the 'Land-use development and planning' thematic category:

- > Urban design – including 'quality-of-life', transport planning etc.
- > Air-quality management and noise-abatement

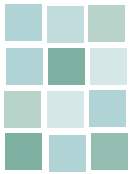
- > Sensitive area management – including Integrated Coastal Zone Management (ICZM)
- > Forest management – Soil and landscape protection – Desertification prevention
- > Others - including rural protection

One common feature is that they are all based on a territorial approach i.e. they are active in a clearly-defined area and the projects must therefore include a strong component of participation from the local population to be sustainable.

Yet, the LIFE projects in this field don't usually go as far as aiming at an overall action in a specific area, as with initiatives for say, Local Agenda 21. The scope (and funding) of the LIFE projects is more narrowly focused – concentrating on a specific environmental problem that needs to be solved. It is when they aim to provide local communities with the tools and the know-how to solve their local problems that these projects are most efficient.

ECO-LUP: an integrated approach to municipal development planning.





2. How was the LIFE funding allocated?

As the table illustrates, 304 out of 1,404 (22%) LIFE-Environment I, II and III projects are related to land-use development and planning or another between 1992 and 2004. The total investment planned by those projects (many are still ongoing) is EUR 401.60 million with a Community contribution of EUR 151.25 million. The “leverage” capacity of this type of project means one euro invested by the EU will be matched by nearly 2 euros from other private and public funds.

Urban design, quality-of-life and transport together draw the highest number of LIFE projects in the land-use development and planning sector – 97 projects (32%), reflecting the diversity of problems to be tackled in this area. Projects in this field typically include an integrated approach to urban traffic, creating ‘greener’ spaces in inner cities, or ecologically-sound development of urban planning strategies.

The second main cluster of projects is that of ‘sensitive area management’, including coastal and other protected zones, accounting for 89 LIFE projects between 1992 and 2004. This includes projects focusing on the sustainable development of European coastal regions; projects covering environmental integration of ports; and projects examining the management of regional urban planning.

The third largest cluster of projects is air-quality management and noise abatement jointly accounting for 73 projects between 1992 and 2004. This sector includes the development of management systems for urban air quality and noise; projects examining the development of low-cost monitoring methods for air pollution in Europe; and projects looking at action on local climate protection in Europe.

Analysing the trends of land-use projects as a whole, it appeared that of the three approaches identified, LIFE beneficiaries mainly invested in methods-oriented projects (69%), followed by awareness-raising and participatory projects (21%) and technology-oriented projects (10%).



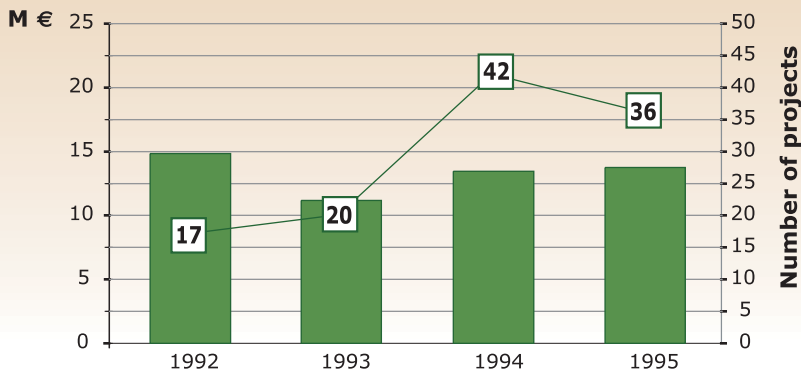
GOAL's aim was to cut the general level of noise and air pollution from motorised traffic in Graz.

Table 1: Land-use development and planning projects financed by LIFE-Environment 1992-2004

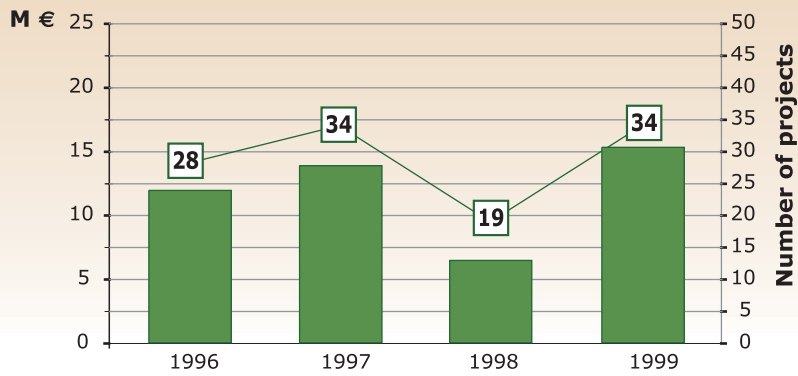
Land-use development & planning projects by sector (1992-2004)	Number of Projects financed	Total cost of projects (EUR Million)	Total EC Contribution (EUR Million)	Percentage EC contribution	Average cost per project (EUR Million)
Urban design – Quality of life – Transport planning	97	133.16	47.11	35%	1.37
Sensitive area management (coastal, protected)	89	103.39	45.06	44%	1.16
Air quality management and noise abatement	73	118.48	39.76	33%	1.62
Forest management – Soil and landscape protection – Desertification prevention	39	44.60	18.25	41%	1.14
Other area - Land use development and planning	6	1.97	1.07	54%	0.33
TOTAL/MEAN	304	401.60	151.25	38%	1.32

Land use development and planning projects

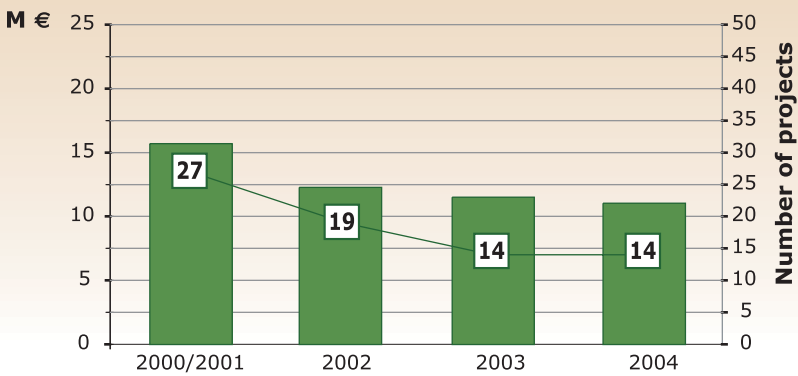
LIFE I



LIFE II

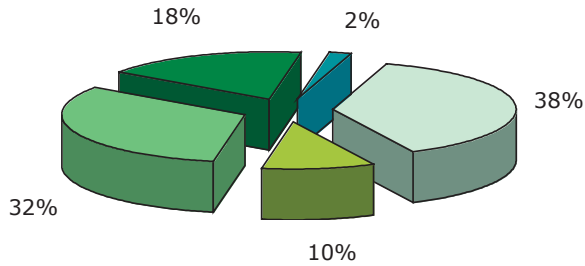


LIFE III

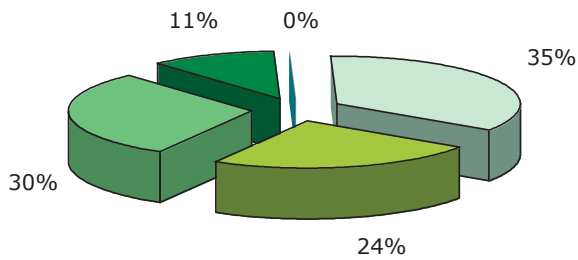


X Number of projects
 EU contribution in Million EUR

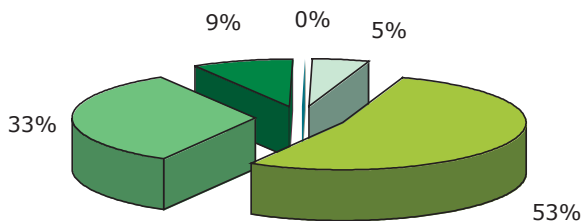
Figure 9-a. Land-use development and planning projects in EUR million for LIFE I to LIFE III to 2004, with line superimposed to illustrate the total number of projects in this field for that year.





**LIFE I -
EU total funding in %**



**LIFE II -
EU total funding in %**



**LIFE III -
EU total funding in %**

 Urban design, Quality of life, Transport planning
 Air quality management and noise abatement

 Sensitive area management (coastal, protected)
 Forest management, Soil and landscape protection, Desertification prevention
 Other area - Land use development and planning

Figure 9-b. Land-use development and planning – percentage of EC co-funding by sub-sector in LIFE I to LIFE III to 2004.

3. What were the main impacts of the LIFE programme in this area?

3.1. LIFE showed that area-based projects are most efficient if they take a 'participatory approach' involving both stakeholders and the local population.

In the 1990s, the ideas of participation and of territorial approaches raised a good deal of interest and a number of LIFE-Environment projects were undertaken to support local people in the design of their own community-based development policies. This 'bottom-up' approach was seen as leading to more sustainable development than 'top-down' approaches - where policies designed in a centralised manner would be applied in a uniform fashion across a range of different areas. A number of international organisations such as the World Bank, the Organisation for Economic Co-operation and Development and United Nations (UN) agencies (UNDP - the UN Development Programme, FAO - Food and Agriculture Organisations of the UN, etc.) also took up these approaches for their own development activities.

Between 1992 and 2004, LIFE co-funded 108 'participatory and awareness' projects, 63 of which were concerned with land-use planning.

A successful LIFE example is provided by the **ECO-LUP** project for an environmental management system for four municipalities in the Lake Constance region in southern Germany, on the Austrian and Swiss borders - an area with a population density more than twice as high as the average for the rest of the EU.

LIFE example: a 'participatory approach'

"Environmental Management for local land-use planning"

The attractive, international region around Lake Constance in southern Germany (on the Austrian and Swiss borders) is an area rich in natural resources and in cultural interest. The four participating municipalities: Dornbirn and Wölfurt (Austria), and Constance and Überlingen (Germany) felt that an integrated municipal approach was needed to cope with trends in water and soil protection, air-quality, local climate change, transport demands, waste-management, and protection of natural habitats. The communities are also responsible for the protection and quality of drinking water for some 4.5 million people.

The project successfully introduced an environmental management system for the four municipalities. This was achieved by the preparation of a detailed analysis of the strengths, weaknesses, opportunities and threats (SWOTs) for each municipality through a series of local and regional workshops. These workshops addressed all municipal (and regional) activity areas of relevance. (These were closely linked to Local Agenda 21 initiatives.) The project team then carried out the trial certification of municipal development planning processes, according to European environmental management standards (EMAS II).

An excellent handbook and supporting software for "Environmental Management for Municipal Development Planning" was also developed and published for use by municipalities throughout Europe.

The project successfully demonstrated that it was possible to apply an environmental management system to a community's planning processes. In October 2004, the City of Überlingen gained the first EMAS (the Eco-Management and Audit Scheme of the European Commission) - certified communal land-use planning in the EU. For further information, contact: <http://www.ecolup.info>. In the longer term, the project aims to establish environmental management as a standard feature in any municipal development planning process.

Project Number:

LIFE00 ENV/D/000326

Beneficiary: Bodensee-Stiftung - Internationale Stiftung für Natur und Kultur (development agency)

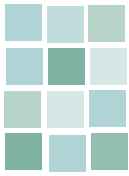
Total eligible cost: EUR 694,620.00

EC Contribution: EUR 347,310.00

Period: 01-Jul-2001 to 31-Mar-2004

Promoting 'greener' building by using solar energy panels on roofs.





3.2 LIFE provided decision-makers at regional / local-level with tools designed to help them make the right decisions in local-area planning.

Decentralised decision-making is often considered as a key to better governance in Europe. The principle of subsidiarity has been enforced and has led to a multi-level system where the decisions are taken at the most appropriate level, often closer to the field and to citizens.

However, having more responsibility at local level means that local or regional actors must have the capacity to manage new tasks. To achieve this, new tools and methodologies must be made available to local actors, to provide them with the means to carry out their new role.

A large cluster of LIFE projects - 137 have embarked on the development of these new methodologies and tools. One successful example is provided by the French-steered "RESPECT" project, which developed and implemented an evaluation methodology for environmental policies among 30 local authorities from five European countries.

LIFE example: methodologies for local-area planning (1) "Demonstration of a master chart, indicators and methods to evaluate environmental policies of local authorities-RESPECT"

Since 1994, different observation and data-collection tools dedicated to helping local authorities manage policies in the environmental field have been set up by a core group of pilot cities, under the co-ordination of the CNFPT branch in Montpellier - a major training institution in France, specialising in training for local authorities.

Launched in 1997, the project aimed to implement and validate an evaluation tool for environmental policies among 30 local authorities from five European countries: France, Spain, Italy, Belgium and the UK. To achieve this, a set of indicators, originally identified by a core group of pilot cities was tested, modified, or validated by the local authority project partners.

A manual was also published, detailing the steps needed to use these indicators, in order to create an 'environment dashboard' to utilise this tool for the evaluation of environmental policies. The project software was developed in French and English, allowing the local authorities to organise the data in a consistent manner according to their range of responsibilities and the availability of information.

The project was successful: each member of the network has implemented aspects of these indicators.

Examples include:

- > Toulouse, France: the environment dashboard is used to evaluate local policies and represents today the environmental chapter of the city's local Agenda 21.
- > Lyon, France: set up an inter-service working group to support the implementation of RESPECT in administration. Several policies have been developed, including measures to combat the negative impact of greenhouse gases.
- > In Ipswich, UK: the indicators were used to develop a local transport plan.
- > In Oxford, UK: a policy on air-quality was implemented, based on the RESPECT indicators. [This is linked to a separate LIFE project "Environmental Monitoring of Integrated Transport Strategies - EMITS" (LIFE95 ENV/UK/000595).]

More recently, the RESPECT association was set up to continue the activities of the network beyond the end of LIFE funding. It can be contacted via its website at: <http://www.respect.asso.fr/> from where the software can also be downloaded.

Project Number:

LIFE97 ENV/F/000201

Beneficiary: CNFPT-Centre National de la Fonction Publique Territoriale

Total eligible cost: EUR 1,032,687.39

EC Contribution: EUR 488,729.71

Period: 01-Mar-1997 to 30-Dec-1999

Demonstration of a master chart, indicators and methods to evaluate the environmental policies of local authorities (RESPECT).



A second example is provided by the Italian "CLEAR" project, which developed and implemented a transferable accounting and reporting tool for improved economic and environmental decision-making at local and city levels.

LIFE example: methodologies for local-area planning (2)

"City Environmental Accounting and Reporting – CLEAR" is the first Italian project for environmental accounting, applied to local authorities.

Its main aim was to create a transferable environmental accounting tool for improved economic and environmental decision-making at local and regional authority levels. The tool was intended to enhance multi-stakeholder and partnership territorial management processes, by providing greater legitimacy to environmental accounting and reporting.

Pilot studies at the local level were implemented by the beneficiary, together with the 17 partner Italian municipalities and provinces. An assessment of their experiences and dissemination at the national and international level (through workshops and seminars), was carried out with the support of the French association Les EcoMaires and the Emilia-Romagna Region.

Environmental accounting of the participating local administrations was carried out throughout the project. By means of this, the partners sought to improve the processes of local governance by: integrating policies; focusing on the management process; improving the quality of public accounting; and by improving transparency and stakeholder participation.

The main result was to involve, for the first time in Italy, 18 local authorities in developing and implementing an 'environmental accounting system'. This single tool for environmental budgeting uses monetary and physical indicators to monitor and manage environmental impacts caused by activities and policies adopted at local level. The new tool can be incorporated in more traditional financial and economic planning tools at local and city level.

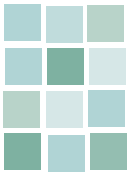
Following the termination of the project, the 18 partner local authorities have continued to cooperate and to maintain their environmental budgeting systems. The working group "Facciamo i conti con l'ambiente" has also been set up to support any municipalities wishing to apply CLEAR procedures.

A follow-up interview carried out by the LIFE monitoring team in 2004, reported that the use of the project methodology is underway in a further five municipalities and that the system has been successfully extended to private firms with substantial public participation involved in the transport, water and waste sectors.

The beneficiary concluded that, thanks to its demonstrative nature, the LIFE programme provided the possibility to test new ideas and instruments that were needed to drive regional policies towards sustainable development. "Co-financing programmes like LIFE are highly necessary, if not vital, for all local authorities who remain excluded from applied research and are offered no other alternative." See the project website at: <http://www.clear-life.it/>

Project Number: LIFE00 ENV/IT/000144
Beneficiary: Municipality of Ferrara
Total eligible cost: EUR 1,928,664.00
EC Contribution: EUR 964,315.00
Period: 01-Oct-2001 to 01-Oct-2003





Graz residents participate in 'fun' exercises at local tram stops.

3.3 The LIFE programme has contributed to improving quality-of-life.

The protection of the environment can often also lead to an improvement in quality-of-life, as shown by a number of LIFE projects. These include:

- > projects aimed at improving mobility, which also make life more comfortable for city and rural dwellers, while helping reduce the use of fossil fuels; and
- > projects aimed at measuring the impact of road traffic on air-quality, which also contribute to improving the overall wellbeing of town and city dwellers.

By using new monitoring tools to assess the impact of new roads or building on general noise levels, some projects also contribute to easing the high stress levels of city life.

Over the period 1992-2004, LIFE co-funded 170 projects focused on improving urban design and quality-of-life. Of these, 66% developed tools and methods, 22% focused on awareness-raising and social participation, and another 11% invested in technologies.

© Schiffer

LIFE example: improving quality-of-life (1)

“Graz: Noise and emission reduction through the promotion of alternative means of transport for citizens’ personal well-being”

In a representative survey carried out in the city of Graz, Austria in 1999, the effect of traffic on the environment was ranked among the most severe of community problems, with 93% of the population deeming the consequences of car traffic “hardly acceptable” or “not acceptable at all”.

This problem is common to nearly all major European cities. With this in mind, the beneficiary aimed to make major traffic generators and transport providers more aware of their customers’ needs. GOAL aimed to reduce both the general level of noise and air pollution resulting from motorised traffic, to save land and increase the general well-being of Graz’ residents.

To do this, target groups were identified (e.g. employers and their staff, residents, professional drivers, the elderly and those with reduced mobility) and various initiatives were introduced to meet their needs in an environmentally-friendly way. These included the following:

- > Following a pilot study in a typical residential area, the speed limit was reduced from 50 km/h to 30 km/h for 40 major roads. As a result, residents’ satisfaction relating to the noise was increased by 30%.
- > A mobile ‘noise-awareness-laboratory’ was set-up on a city bus. The bus was equipped with several computers providing information on theoretical and practical know-how for noise-abatement.
- > Mobility action programmes were initiated for companies and organisations. Health check services were provided in co-operation with an insurance company and people were encouraged to improve their health, by changing their mobility habits e.g., by sometimes walking instead of driving..
- > The awareness programme was disseminated to local schools and nurseries. This resulted in a 20% increase in the numbers of children walking, or being taken to school, on foot.

- > The project trained 14 local agenda managers in selected residential areas. Around 11,000, ‘significant improvements’ in the living environment were achieved by establishing structures in which decisions were taken in a collaborative manner.
- > A public transport scheme was carried out to encourage people to participate in easy and fun exercises while waiting for their trams or buses: this resulted in a subjective impression that waiting-times had been shortened.
- > 350 taxi drivers and over 200 bus drivers were introduced to driving in a ‘low noise’ style. This has now been fully integrated into training of professional drivers.

Finally, the project beneficiary states these schemes helped to save an impressive 861,000 km worth of car journeys. This is equivalent to savings of 120 tons of CO₂, 0.47 tons of Nitrogen Oxides (NO_x) emissions and 0.39 tons of Volatile Organic Compounds VOCs.

More recently the beneficiary, together with project partner Graz Transport Services, (Grazer Verkehrsbetriebe) is collaborating on another LIFE project, launched in 2004, to reduce airborne pollution in the cities of Graz, Klagenfurt and Bozen. This involves measures to cut traffic and to install pollution monitoring instruments on public buses. It will be accompanied by PR activities aimed at making the public more aware of urban pollution from traffic. The new project is based on the results and methods employed in the earlier GOAL project. See the project website at: <http://www.goal-graz.at/>

Project Number: LIFE00 ENV/A/000240
Beneficiary: Stadt Graz-Umweltamt (Graz department of Environment)
Total eligible cost: EUR 1,012,757.00
EC Contribution: EUR 504,474.00
Period: 01-Jan-2001 to 30-Jun-2003

"As 80% of EU citizens live in towns and cities, it is very important to improve the quality of urban life," said former Environment Commissioner Margot Wallström in a statement in early 2004. "Pollution, noise, heavy traffic and many other environmental problems are concentrated here. Meeting environmental targets and objective is vital to making cities healthy places to live in. This is why we need a coordinated and coherent strategy." (Reference: IP/04/204 Date: 16.02.2004)

The following Hungarian project is an example of the benefits of networking in the LIFE programme. It was launched as a direct result of another successful LIFE project: **EuroBionet**, based on work by the Institute for Landscape and Plant Ecology at the University of Hohenheim, Stuttgart, Germany (LIFE ENV/D/000453). This project (see p.115) used 'bioindicator' plants, such as tobacco, poplar, grass cultures and curly kale, to monitor urban air pollution. (Bioindicators are organisms that react to environmental effects by changing their vital functions and/or chemical compositions.) The project set up demonstrations of its work in towns and cities throughout Europe. The idea was that if people saw for themselves these negative environmental effects, it might influence future behaviour or attitudes. When the project closed, the team released a detailed manual so that other countries could benefit from its methods. This led to the creation of the East Hungarian Biomonitoring Network (EHBN) and the launch of the Hungarian project.

EuroBionet project logo

LIFE example: improving quality-of-life (2)

"Establishment and operation of a regional biomonitoring network for the assessment of air quality"

The goal of this project was to promote a new approach to air pollution assessment in Hungary. To achieve this, a bio-monitoring network was established in the five largest cities in the Hungarian eastern frontier zone, based on the EuroBionet methodology. Prior to the launch of the project, because of deficiencies in the air pollution monitoring network operated by local authorities, decision-makers had only limited information on air pollution. The EHBN was the first system, able to provide large, quantitative data for municipalities.

The project beneficiary was responsible for managing the network and for disseminating the project's findings and other information to the national authorities and local government decision-makers.

As with EuroBionet, this recently-closed project demonstrated to the public, as well as decision-makers, the pollution situation in cities. The data gathered on the pollutants in the five Hungarian cities - sulphur dioxide, nitrogen dioxide, ozone and several others - was monitored using Geographic Information Systems (GIS).

The data was used to produce 'air-quality' maps that were sent to each local authority. One of the most worrying environmental aspects of the project's work was that the EHBN results indicated that 10 years after the phasing out of leaded petrol, lead had still not disappeared from the atmosphere.

As a result of the work, hundreds of air pollution maps were sent to the participating cities. These so-called 'pollution pictures' helped local officials better understand the pollutant problem in their respective cities, and provided them with evidence for the argument for creating changes in industry and in city infrastructures e.g. in future transport and land-use planning.

The public too was given a clear idea, via these pollution pictures and the use of bioindicators placed at monitoring sites, to illustrate the harmful effects of pollution in their cities (e.g. leaves on the plants became partially grey at a certain level of pollution). This awareness campaign was accompanied by information on ways of reducing urban pollution (e.g. by walking, cycling or car-pooling to work, school etc).

As a direct result of this project, the participating cities have increased their green areas in sites, which according to the EHBN, were "highly polluted". The project officially closed in January 2005. But, the beneficiary says its dissemination work will continue. The longer-term goal is to see the success achieved developing into lasting change in Hungary. See the project website at: <http://www.tikofe.hu/>

Project Number:

LIFE00 ENV/H/000936

Beneficiary: Environmental Protection Inspectorate of the Transiszanian Region

Total eligible cost: EUR 886,720.00

EC Contribution: EUR 431,610.00

Period: 06.01.2001 to 02.01.2004





© Martin Stock

The unique Wadden Sea area falls within 7 regional administrations in 3 countries increasing the need for a 'participatory' approach.

- > A proposal for a European Parliament and Council Recommendation concerning the implementation of Integrated Coastal Zone Management in Europe (COM/00/545 of 8 Sept. 2000). This Recommendation was adopted by Council and Parliament on 30 May 2002.

The LIFE programme funded 14 of the demonstration projects between 1996 and 1997, while others were funded by INTERREG IIC (TERRA programme) or PHARE (the programme of assistance for central and eastern European countries). Overall, the projects represented the diversity of the ecological, economic and social problems of Europe's coastal regions. The geographical distribution and range of problems encountered in the areas selected for the projects also provided a good basis for the demonstration programme. The projects provided the practical means of assessing the impact of proposed measures, and enabled a consensus on actions to be easily reached.

An example of the range of problems encountered in coastal zones is demonstrated by a LIFE project for the Wadden Sea area - the largest wetland area within the EU, covering almost 10,000 square kilometres along the Danish, German and Dutch North Sea coastlines. The project aimed to develop an action plan on the development of sustainable tourism in this area. Particular emphasis was placed on involving key stakeholders and in promoting a 'bottom-up' approach in the decision-making process. It is also of considerable interest for EU policy development, both in the context of the ICZM programme and in the general context of promoting cross-border inter-regional cooperation.

3.4 LIFE has contributed directly and indirectly to European policy-making in coastal zone management

In the mid-1990s, the LIFE-Environment programme took part in a multi-DG experiment aimed at developing working methods to support Integrated Coastal Zone Management (ICZM).

Many of Europe's coastal zones face problems of deterioration of their environmental, socio-economic and cultural resources. They are often major providers of food and raw materials (e.g. fishing, farming, oil etc.) provide vital links for transport and trade and are often the location of valuable habitats. Yet at the same time they are popular residential areas, and favoured tourism and leisure destinations.

Coastal zones are facing serious problems of habitat destruction, water contamination, coastal erosion and resource depletion. The challenge for land-use planners therefore is to find ways of meeting these, often conflicting demands, over use of space.

Concern over this issue prompted the EU to run an exploratory programme to identify possible collective solutions to these problems. Between 1996 and 1999, the Commission operated a Demonstration Programme on Integrated Coastal Zone Management (ICZM) based on a series of 35 demonstration projects and six thematic studies. This programme aimed to:

- > provide technical information about sustainable coastal zone management; and
- > stimulate a broad debate among the various actors involved in the planning, management or use of European coastal zones.

It was intended to lead to a consensus regarding the measures necessary in order to stimulate ICZM in Europe. In 2000, based on the experiences and results of the demonstration programme, the Commission adopted two documents:

- > A Communication from the Commission to the Council and the European Parliament on "Integrated Coastal Zone Management: A Strategy for Europe" (COM/00/547 of 17 Sept. 2000)

LIFE example: coastal zone management (1)

“Integrated Co-operation on Sustainable Tourism Development and Recreational Use in the Wadden Sea Area”

The 10,000 sq Kilometre Wadden Sea area, along the Danish, German and Dutch North Sea coastlines, is one of the largest NATURA 2000 sites currently being run according to the ICZM (Integrated Coastal Zone Management) principles set by the EU. It has vital commercial significance for large parts of Europe, encompassing some of Europe's largest cities and industrial areas. It is also an area attracting millions of tourists every year. The fact that this unique area falls within seven regional administrations in three countries increased the need for the development of a participatory and co-ordinated approach.

The national authorities of the Netherlands, Germany and Denmark had already been co-operating on the protection of the area since 1978. But, in 1994, the Inter-Regional Wadden Sea Corporation (IRWC) was established. In 1996 this body decided to use the LIFE programme to intensify the co-operation.

The LIFE project set out to create a communication model, involving key stakeholders in order to forge a joint vision and produce concrete proposals for sustainable tourism. The project beneficiary was the Danish county of Sønderjylland in South Jutland. Special emphasis was placed on promoting a ‘bottom-up’ approach in the decision-making processes.

It successfully met all its objectives. In the first phase, a fairly complex communication and cooperation model consisting of 18 experts, coordination teams, a secretariat, advisory boards was established. This succeeded in taking into account the different democratic structures in the three countries. A key element in the success of this communication model was derived from its base in existing networks and its integration into existing democratic structures.

In the next phase, the report on “sustainable tourism” prepared by the 3rd Interregional Wadden Sea conference (October, 1997) was politically endorsed. This report documented the current situation and set out proposed guidelines. These were further elaborated through a series of NetForum workshops (18 members representing different political levels in the three countries). The outcome was a common vision on a number of points on developing sustainable tourism in the following: Nature and recreational activities; Culture and cultural tourism; and Transport and accommodation.

In the final phase the report was handed over to the Interregional Wadden Sea Cooperation, which selected priority actions and initiated the development of a detailed action plan, indicating clear political and technical responsibilities for each activity. This plan was finally endorsed first at inter-regional level before being approved formally by the 9th Governmental Wadden Sea conference in Esbjerg in October 2001.

The 10,000 Km² Wadden Sea area is the largest wetland area within the EU.

The environmental benefits of the project were indirect: it paved the way to providing a methodology for achieving sustainable tourism in complex politically divided regions. As a result, it is of considerable interest for EU policy development, both in the context of the ICZM programme and in the general context of promoting cross-border interregional cooperation.

The project closed in December 2000. A follow-up ex-post evaluation, carried out by the LIFE monitoring team in May 2004, concluded that the project's main objectives – to create a communication model between stakeholders and to use this to create a joint vision for sustainable tourism – have lasted and are being continually utilised by the project stakeholders.

The beneficiary reported that the original Netforum has now been dismantled to make way for a new larger network, the Trilateral Wadden Sea Forum. The aim of this network is to use the experiences gained under the LIFE project as a model for cooperation over a wide range of issues beyond the tourism sector.

Project Number:

LIFE96 ENV/DK/000012

Beneficiary: Sønderjyllands Amtsråd

Total eligible cost: EUR 663,761.31

EC Contribution: EUR 328,636.47

Period: 01-Aug-1996 to 31-Dec-2000





A second LIFE project concerns an initiative for sustainable management of dunes and beaches in the north and northwest of Ireland. The resulting management plan was used as the basis of a dissemination programme designed to inform and influence coastal policy at the European level.



Dune erosion due to tracks by a quad-bike or similar off-road vehicle at Lisfannon, County Donegal, Ireland.

The beach at Narin, County Donegal, Ireland, with the drift lines of seaweed that are an important part of the dune-building process.



LIFE example: coastal zone management (2)

“Implementing alternative strategies in Irish beach and dune management : community involvement in sustainable coastal development”

Coastal zone management in Ireland traditionally involves the use of engineering structures to stabilise the shoreline. The construction of such structures has resulted in beach loss, beach lowering and erosion of adjacent beaches.

The environmental goals of this project included beach and dune management plans for seven beaches in the north and northwest of Ireland and the dissemination of good practice in rural beach management.

The beneficiary was the University of Ulster, Northern Ireland. During the project seven management plans were successfully completed through a process of public involvement in data gathering, consultation via several public meetings at each site, and participation in the selection of options, following distribution of a consultative document. The project took an integrated, cross-sectoral approach to management of the coastline for the first time. This involved the collaboration of local authorities, the University and local communities.

Most of these plans were successfully implemented to form part of the “County Donegal County Development Plan”, a statutory document that guides development in the Donegal district.

Good practices were disseminated through a “Good Practice Guide”, written by the project staff and published by Donegal County Council. It has been promoted widely to local authorities throughout the United Kingdom and Republic of Ireland, and elsewhere in Europe. It can be downloaded at: <http://www.science.ulster.ac.uk/ccmr/downloads.html>

A follow-up questionnaire, completed recently by the beneficiary, added that several further studies have been undertaken, on the basis of the relationship between the local authority and the University, and the experience gained by both organisations. One example was a study undertaken by the University, funded by the local authority, to assess coastal erosion and to provide management recommendations. Ongoing collaboration has also been supported by the SEUPB (EU Peace and Reconciliation Fund) in the area of beach management in Donegal (Republic of Ireland) and Limavady (Northern Ireland) on a cross-border basis. The beneficiary is also developing closer links with other local authorities and community groups to undertake specific studies in coastal management.

In conclusion, the beneficiary stated that there was “no better alternative than LIFE for funding of this project” as it was very much at the interface between research and implementation. “Coming at the beginning of the formalisation of an EU approach to Coastal Zone Management, it preceded national and regional initiatives in this field and enabled the establishment of a partnership between a local authority and a research institution. The benefits to both organisations have been much greater than anticipated...”

Project Number:

LIFE96 ENV/UK/000404

Beneficiary: University of Ulster

Total eligible cost: EUR 1,312,006.72

EC Contribution: EUR 630,403.23

Period: 20-Mar-1997 to 20-Sep-2000

LIFE example: specific tools for specific areas (1) “Water data Acquisition in real Time for coastal Ecosystems”

The Italian WATERS project was developed to tackle problems related to environmental monitoring of pollution parameters in the Venice lagoon, and to help improve surveillance of the lagoon environment and pollution recovery practices. This included improving the potential for prompt intervention in the event of pollution, in order to reduce the negative environmental impact, and for decision support in the environmental management of water resources.

The project was undertaken by AMAV – (Azienda Multiservizi Ambientali Veneziana), a development agency in charge of environmental protection of the Venice region. Fifteen boats from AMAV’s operating fleet were equipped with special monitoring and data transmission devices and made daily systematic trips covering the entire lagoon system, an area of approximately 550 km².

The technical solutions developed by the project were particularly innovative and contributed to significantly advancing water monitoring technology. The project achieved its objectives and the Venetian water authority, “Magistrato alle Acque” officially adopted the WATERS system for monitoring the quality of water in the Venice lagoon on 23 November 2000.

The WATERS monitoring system was compared to conventional systems (fixed stations) in order to demonstrate its advantages. It proved more economical: its operating costs, including depreciation, were only a quarter of those of conventional systems.

From a qualitative point-of-view the main environmental benefit arose from the possibility of quick assessment and intervention in case of water contamination. The potential for transferability was high, as the methodology demonstrated that real-time systematic surveys on water quality could be achieved at a low cost.

The system can also easily integrate on-line fixed monitoring stations and could be successfully used to reduce environmental risks by enabling rapid diagnosis of water-quality.

Since the project closed, its results have generated a good deal of interest from institutions and public bodies concerned with water monitoring. For example, the Feminine Municipality (Rome) has successfully applied the monitoring system on the Tevere River. Expressions of interest have also been received from the authorities in Rio de Janeiro (monitoring of Guanabara Bay) and from the Jordanian Minister for Water and Energy (monitoring of the Gulf of Aqaba). See the project website at: <http://www.progettowaters.it/>

Project Number:
LIFE96 ENV/IT/000103
Beneficiary: AMAV
Total eligible cost: EUR 3,218,561.99
EC Contribution: EUR 719,331.97
Period: 01-Oct-1996 to 01-Aug-2000

3.5 LIFE has helped to design specific tools for the protection of specific type of areas

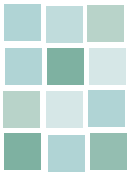
The territorial approach is based on the premise that different areas might require different types of intervention to solve their environmental problems. The protection of the Venice lagoon, Italy, for example requires a different set of methods and tools than say, the management of wetlands in Wales, Great Britain, or the monitoring of erosion on the Isles of Wight.

LIFE has allowed many projects to develop these specific methods and tools, enabling management of these areas to be improved. The two following examples illustrate this.

LIFE-Nature projects are also directly involved in protecting specific types of areas. But their general objective is more directly related to the protection of biodiversity.

One of the specially-equipped surveillance boats in action on the Venice lagoon.





LIFE example: specific tools for specific areas (2) "Coastal Change, Climate and Instability"

Land-use planning experts recognise the widespread occurrence of slope instability throughout the world. As a result of both climate change impacts and increasing development pressures, it is therefore reasonable to conclude that unless active measures are implemented regarding the limitation of landslides and hazard management, the costs arising from slope failures (both coastal and inland) are likely to escalate in the future.

The costs arising from coastal and inland instability problems can be difficult to quantify. But the economic and social effects clearly have a significant impact worldwide. Sustainable development requires accurate risk assessment and informed decision making, taking full account of past and present ground conditions.

The local authority on the Isle of Wight, UK, was the beneficiary, but a number of partners from three different countries were also involved in this LIFE project whose aim was to develop methods for risk assessment in this type of context.

The main project objectives were to:

- > Demonstrate the value of using historical evidence to predict the nature, scale and pace of coastal change;
- > Study the relationship between rainfall, groundwater, erosion and ground movements, to aid the development of more reliable methods for landslide forecasting and risk assessments in coastal and mountainous areas;
- > Develop risk-assessment guidelines and a code of practice for decision-makers and other groups concerned with urban landslide areas.

Studies by the LIFE project partners in the Solent (the area of water between the Isle of Wight and mainland England), Ireland and western France have revealed a rich, well-preserved heritage and palaeo-environmental archive in coastal and inter-tidal zones that could be used to aid shoreline management and coastal planning generally.

The coastal zones and estuaries of Europe contain a rich archaeological resource which, if examined appropriately, can provide advice on coastal evolution and help to explain past climatic changes. Experiences from the past can help understand the possible impacts of climate change in the future.

The LIFE project brought together a multi-disciplinary team of scientists, academics and practitioners from across the EU. The project also received input from Switzerland, the Far East, Australasia and North America. As a result of this analysis, some 30 recommendations were made to help increase awareness of the need to implement improved planning and management policies in an area set to escalate as a result of development pressures and climate changes.

Following the termination of the project, further funding from the LIFE programme was obtained to carry out a new project: to develop sustainable strategies to assist local authorities and other stakeholders with the management of natural risks in the coastal zone; and to assess the current and predicted future costs of managing coastal risks.

Project Number: LIFE97 ENV/UK/000510
Beneficiary: Isle of Wight Council
Total eligible cost: EUR 1,235,075.91
EC Contribution: EUR 610,124.17
Period: 01-Oct-1997 to 01-Oct-2000

Another specific type of land-use management concerns slopes, which are prone to instability, and have an impact on coastal zones when coupled with climate changes.

An aerial view of the Blackgang landslide on the Isle of Wight, UK.





To conclude therefore, the previous sections have hopefully provided a clear indication of the way LIFE-Environment projects helped steer innovation and development in this area between 1992 and 2004. "What field are we in?" focuses on the background and key environmental issues related to land-use planning and management decisions in Europe, and highlights the Commission's four major goals in this area. The question "How was the LIFE funding allocated?" is answered by tables and figures outlining the distribution of funding and number of projects for the five generic sub-themes identified from the LIFE database of projects. The question "What were the main impacts of the LIFE programme?" is answered by five key messages – supported by a wide range of successful projects from different Member States – demonstrating environmental innovation and confirming the direct and indirect contributions of the LIFE programme to European policy-making in this field .

4. Looking ahead: LIFE-Environment in 2005 and onwards ...

The 6th EAP places a high priority on the development of a new Thematic Strategy on the Urban Environment (see below) to help promote a more integrated approach and support action at local level.

Looking to the near future then, as laid down in the LIFE-Environment application guide 2005, the LIFE programme will finance innovative projects aimed at "sustainable land-use development and planning, including in urban and rural areas". The priorities are as follows:

1. Sustainable urban development¹

- > Development and promotion of sustainable urban transport plans for town and cities (to reduce urban transport demand, increase the share of public transport, encourage less polluting transport modes and improve the environmental performance of the transport system as a whole).
- > Implementation of integrated urban environmental management in towns and cities, including the reduction of noise levels, particularly from transport and construction activities and meeting specific environmental targets.

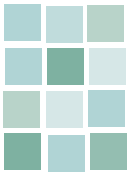
The ICZM project for the Wadden Sea shows how LIFE has steered development in land-use planning.

2. Air quality management

- > Support plans and programmes providing innovative solutions for air pollution abatement or for launching, monitoring and evaluating such plans and programmes through the use of indicators of the impact on health and the environment, including bio-indicators².

¹ Particular attention will be given to projects which may be used to support the Thematic Strategy on the Urban development prepared by the Commission – http://www.europa.eu.int/comm/environment/urban/thematic_strategy.htm.

² Bio-indicators – organisms, or communities of organisms, reacting under environmental influence with changes in their life functions and/or their chemical structure and therefore making it possible to draw conclusions on the state of the environment.



4.2: LIFE and Water



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1. What field are we in?

Despite some remarkable results, for example improvement in the quality of inland waters, such as the Rhine and the Danube, water resources in many parts of Europe are under threat from a range of human activities leading in some areas to significant problems. However, measures such as the adoption of the framework Directive on water¹ should provide the context for water management tools that enable water resources to be both protected and improved. The Sixth Environmental Action Programme (6th EAP) also provides for a number of measures for the integration and implementation of the Water Framework Directive.

The long-term protection of water in Europe requires constant and practical innovation efforts in order to identify appropriate responses to very different environmental problems. This is where the LIFE-Environment programme comes in, developing tools enabling a series of concrete actions to be taken in conserving natural environments or promoting methods of sustainable water management, thus complementing legislative measures.

In this sector, 12 years of LIFE have certainly played a key role in providing solutions to many of the environmental problems associated with water resource management. Notably, a cluster of LIFE projects is seeking a reduction in the quantity of water abstracted in Europe (see Key Facts & Figures) and has been active in promoting water-saving measures by developing innovative water-saving technologies, and by improving the performance of distribution networks (resulting in a reduction of leakage). LIFE has also been active in specific sectors such as tourism, which is one of the fastest increasing socio-economic activities in Europe, but which places severe, often seasonal, pressures on water resources at the regional and/or local level.

Yet the LIFE programme has gone further – providing an opportunity for the development of new management tools that enable water authorities to better fulfil their requirements to achieve good ecological status of water bodies by 2015, and by contributing to raising public awareness in Europe about the need to manage water as a precious resource.

River restoration: the Gamerensche Floodplain along the River Waal (southern branch of the River Rhine) in the Netherlands.

The overall extraction and consumption of water resources in the EU is currently sustainable in the long-term. However, some areas may be facing unsustainable trends, especially in southern Europe. The three main users of water are agriculture, industry and the domestic sector. Significant efficiency improvements regarding water usage

¹ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000, establishing a framework for Community action in the field of water policy [OJ L 327, 22.12.2000] amended by Decision No 2455/2001/EC of the European Parliament and of the Council, of 20 November 2001 [OJ L 331 of 15.12.2001].

Water: key facts & Figures

Water abstraction

Europe abstracts only 7% of its fresh-water resources, a reasonable figure on a world-wide scale. On average,

- 42% of total water abstraction in Europe is used for agriculture, irrigation being the main cause of groundwater overexploitation in agricultural areas,
- 23% is used for industry, a figure that is decreasing due to technological progress,
- 18% is for urban use, a figure that is increasing due to increased urbanisation, population growth and higher living standards,
- 18% is for energy production, a figure on the decrease.

Measures to reduce water use

Charging consumers' behaviour relating to water use can be influenced by economic instruments used by some countries. Other factors that influence water-use patterns include:

- Climate variations;
- Information campaigns;
- Use of water-saving technologies;
- Improved performance of distribution networks (reduction of leakage and mains pressures).

Drinking water quality

Groundwater is a major source of drinking water all over Europe, and thus the state of groundwater in terms of quality and quantity is of vital importance. Groundwater is affected by human activities such as the use of nitrogen fertilisers and pesticides, water abstraction, and interventions in the hydrological cycle such as land sealing. (In 2003, the Commission published its new Groundwater Directive proposal which includes specific measures to prevent and control pollution of groundwater (COM (2003) 550 final).

Agriculture is the main source of nitrogen input to water bodies; however, agricultural use of commercial nitrogen fertilisers fell in nearly all of Europe in the 1990s. In general, there has been no substantial improvement in the nitrate situation in European groundwater and hence nitrate pollution of groundwater remains a significant problem.

Pesticides in groundwater (and surface waters) arise from use in agriculture, horticulture, fruit growing, viticulture and forestry, for public and private pest-control purposes, manufacturing and industrial activities.

Nutrient and organic pollution of inland and coastal waters

High organic matter concentration has several effects on the aquatic environment including reducing the chemical and biological quality of river water, the biodiversity of aquatic communities and the microbiological quality of waters. It is usually a result of organic pollution, caused by discharges of untreated or poorly treated sewage, industrial effluents and agricultural runoff. Large inputs of nitrogen and phosphorus can also lead to ecological changes in the marine environment. Levels of phosphorus and organic matter have generally been decreasing in rivers in Western European (WE) countries and new Member States over the past decade.

In the past, urban wastewater has been a major source of nutrient pollution but recently treatment has improved and outlets have been diverted away from many lakes. In the northern and central WE countries most of the population is now connected to wastewater treatment plants, many to tertiary plants which further remove nutrients and organic matter.

Several industrial sectors, which in the 1970s and 1980s had large emissions of organic matter, have now markedly

reduced their discharges by the introduction of cleaner technology and improved wastewater treatment.

The move towards cleaner technologies is driven partly by EU directives such as the integrated pollution prevention and control directive (IPPC), which requires large facilities to use the best available technology to make radical environmental improvements.

Pollution of water bodies by hazardous substances

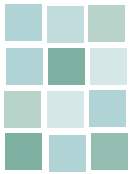
North Sea states have met the 50% reduction target for a large number of the 37 priority substances (set at the Fourth North Sea Conference in 1995), and most also achieved the 70% reduction target for mercury, cadmium, lead and dioxins. However, targets were not consistently met for some other substances such as copper, tributyltin (TBT) pollutants and some pesticides.

Oil pollution

The main sources of oil pollution in the marine environment include maritime transport, coastal refineries and offshore oil and gas installations, land-based activities (either discharging directly or through riverine inputs) and atmospheric deposits.

Between 1987 and 1996 an estimated 22,000 tonnes of oil were spilled as the result of shipping incidents. Despite pollution from oil spills on a world-wide scale being reduced by 60% since the 1970s, major accidental oil tanker spills (i.e. greater than 20,000 tonnes) still occur at irregular intervals in European seas. The Prestige accident in 2002 (Spain) spilled more than 20,000 tonnes.

[Source: Europe's Environment: the third assessment – European Environment Agency EEA, 2003].



2. How was the LIFE funding allocated?

Some statistical information on LIFE and water

As the table shows, 254 out of 1,404 (18%) LIFE-Environment I, II and III projects were undertaken specifically on issues related to water management between 1992 and 2004. It must be noted that many more projects were related to water, but with another central theme such as the environmental impact of economic activities or Integrated Product Policy (IPP). This section concerns water and wastewater projects. The total investment planned by those projects (many are still ongoing) is EUR 126.78 million. The "leverage" capacity of this type of project is particularly important, as one euro invested by the EU will be matched by over two euros from other private and public funds.

Almost half the projects are in the field of wastewater treatment. This is because water is wasted in a wide variety of ways (households, but also different types of industries) requiring ad-hoc solutions, specific to one type of industry or technology. Some cleaning technologies such as membrane filtration can be applied in many different industries, but require adaptation to the different industrial conditions.

Also, it is noteworthy that the water industry is generally slow to respond to technological advances due to high infrastructure costs.

The second largest cluster of projects is those dealing with water supply, water quality, and ground water protection: 66 projects - 26% of the total. The third largest cluster of projects concerns water management at the scale of the river basin. This cluster accounted for 54 projects - 21% of the total. Many of these projects are still ongoing, as this approach is a major innovation in the water policy at European level.

The fourth cluster addresses diffuse and dispersed sources of pollution. This final cluster contains a relatively small number of projects (17) as similar projects are also classified under the clean technologies' heading. See chapter 4, section 4.3. (Minimizing the environmental impact of economic technologies).

Analysing the trends of water projects as a whole, it appeared that of the three approaches identified, LIFE beneficiaries mainly developed technology-oriented and methods and tools-based projects (56% and 41% respectively), followed by awareness-raising and participatory projects (3%).



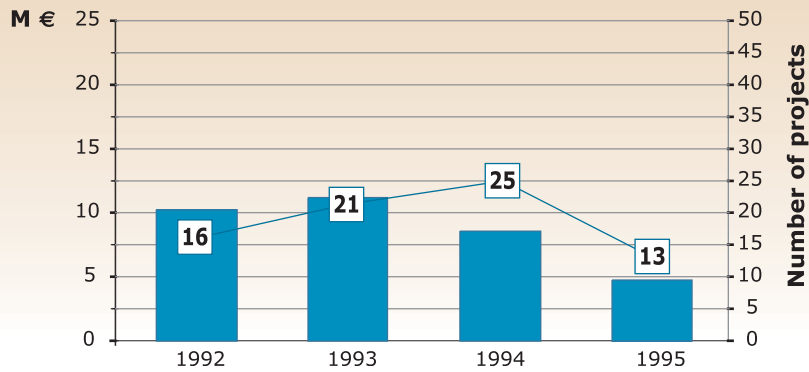
Flood simulation using hydrological modelling and visualised through GIS technology.

Table 2: Water projects financed by LIFE-Environment 1992-2004

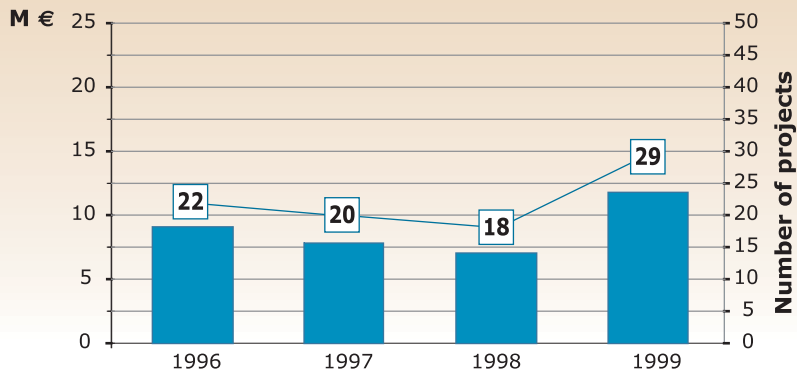
Water projects by sector (1992-2004)	Number of Projects financed	Total cost of projects (EUR Million)	Total EC Contribution (EUR Million)	Percentage EC contribution	Average cost per project (EUR Million)
Wastewater treatment –	117	195.56	54.72	28%	1.67
Water supply - Water quality - Ground water protection	66	111.64	30.70	27%	1.69
Water management at the scale of the river basin	54	94.71	32.14	34%	1.75
Diffuse and dispersed sources of pollution	17	22.62	9.22	41%	1.33
TOTAL/MEAN	254	424.53	126.78	30%	1.67

Water Management

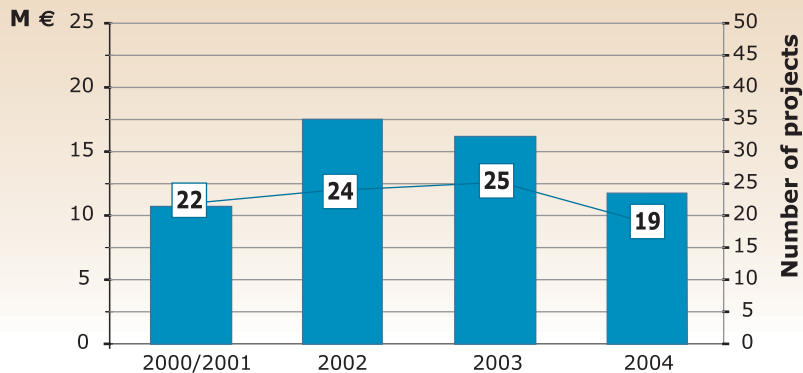
LIFE I



LIFE II

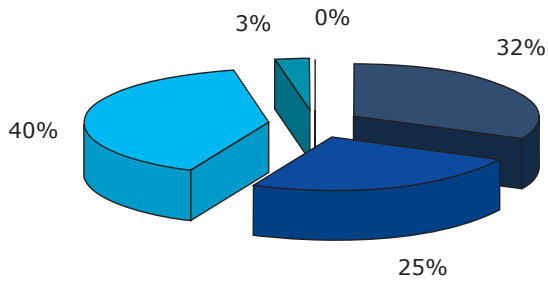


LIFE III

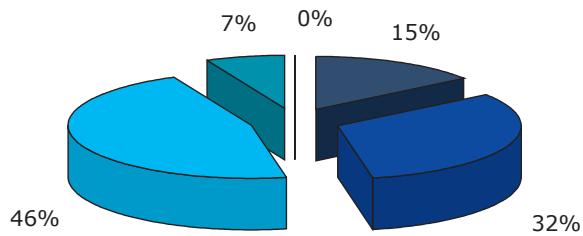


X Number of projects ■ EU contribution in Million EUR

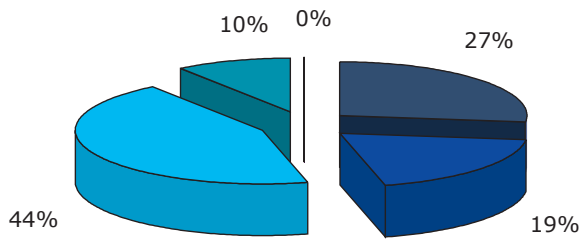
Figure 10-a. Water management projects in EUR million for LIFE I to LIFE III to 2004, with line superimposed to illustrate the total number of water projects for that year.



**LIFE I -
EU total funding in %**



**LIFE II -
EU total funding in %**



**LIFE III -
EU total funding in %**

- Water management at the scale of the river basin
- Waste water treatment
- Water supply - Water quality - Ground water protection
- Diffuse and dispersed sources of pollution
- Other area - Water Management

Figure 10-b. Water management – percentage of EC co-funding by sub-sector in LIFE I to LIFE III to 2004.

3. What were the main impacts of the LIFE programme in the water sector?

3.1. LIFE water projects have indirectly influenced the implementation of the Water Framework Directive, issued in 2000

Initiatives at the level of the river basin are at the heart of the EU Water Framework Directive (WFD) issued in 2000 - the major piece of environmental water legislation in Europe. Over the period 1992-2004 LIFE cofunded 61 projects concerned with river restoration, or water management at the scale of the river basin. A number of ongoing, or more recently-closed of these projects are thus indirectly contributing to the implementation of the Directive.

Finnish rivers are some of the least polluted in Europe... but their value for recreation use is deteriorating due to a lack of integrated water pollution control.



LIFE example: Water management at the scale of the river basin “A cost-effective decision support system for management of boreal river basins”

Finnish rivers are some of the least polluted in Europe. However, their value for recreational use has deteriorated over the past ten years. One of the reasons for this is the lack of integrated approaches to water pollution control. All land-use forms (agriculture, forestry, peat production etc..) produce an environmental impact on a river's ecosystem through the loading of suspended solids, nutrients, metals and acidifying substances. However, if these detrimental effects are to be limited, the river basin has to be considered as a whole and better use made of existing remediation methods e.g. sedimentation basins and wetlands). General awareness of environmental issues also needs to be increased.

The “RiverLife” project was developed by an international consortium of specialist organisations (six universities, four regional environment centres, two research institutes and two SME's) with experience in environmental modelling and the development of computer-based user interfaces. Its main purpose was to create a new, cost-effective, practical tool for sustainable river basin management, using an interactive computer-based Decision Support System.

This system was tested and demonstrated in pilot projects on three rivers: River Siuranjoki, the River Simojoki, and the River Kyrönjoki. This enabled the project team to fill the gaps in existing knowledge on water pollution control and river status assessment and to draw up guidelines for cost-effective and adequate monitoring procedures according to the WFD. The information gained was used to promote more effective pollution control and ecological land-use by various target groups from decision-makers to school children via the project website.

The project achieved its principal objective of developing computer-based tools for the management of the river basin. The system was developed in three languages (Finnish, Swedish and English) and was designed to be easily transferable to other EU countries.

Wide dissemination was also carried out through conventional means (articles, seminars, conferences etc) as well as through the project website (now closed, but information in Finnish and English is still available at <http://www.environment.fi/> - the Finnish environmental administration website), project publications and a video.

The testing of the project methodology resulted in the development of specific follow-up proposals for ecological monitoring, management and pollution control in the three river areas, and the drawing up of guidelines for general river basin management. In one of the areas: the River Kyrönjoki, a national pilot river basin site for implementing the WFD, a plan for ecological management and monitoring was drawn up and an automated river monitoring and control system tested. This provides continuous, detailed information on water chemistry and hydrology, enabling the authorities to respond quickly to any deterioration in water quality, by changing the river flow.

The experience and results from the project have been extensively utilised since the project's end e.g. as follows: Classification of rivers as sources of drinking water; Kola River project (co-financed by EU) to develop water pollution control at Kola river basin in North-West Russia; the PRIMROSE project (FP5 Research) utilised RiverLife for constructed and riverine wetlands for optimal control of wastewater at catchment scale utilising e.g. the GIS tool developed. The implementation of the Water Framework Directive, regarding the river dominated watercourses and corresponding catchments has also benefited from the RiverLife results and tools, especially in the classification of the water bodies.

Project Number:

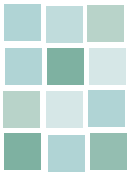
LIFE98 ENV/FIN/000573

Beneficiary: North Ostrobothnia Regional Environment Centre

Total eligible cost: EUR 853,709.13

EC Contribution: EUR 411,995.33

Period: 01.09.1998 to 01.09.2001



3.2 LIFE has enabled technical solutions to be found for a number of specific problems related to the supply of freshwater and drinking water

Ensuring a regular supply of fresh and drinking water is a task that could benefit from the development of environmental technologies and management methods. A cluster of LIFE-Environment projects - 35 have looked at ways of improving the delivery of water and the distribution networks.

The submerged membrane modules can be used in existing settling tanks (shown here).



LIFE example: improving delivery of water and of distribution networks “Reuse of filter backwashwater from groundwater treatment for drinking water purposes with a submerged membrane system”

Many drinking water supplies contain substances (e.g. inorganic matter, micro-organisms) that must be removed before it can be used for human consumption. Filters are in constant use and must themselves be washed out. This backwashing uses up to 3% of the fresh water volume, which is then disposed of as wastewater and thus lost to human consumption. To conserve this water for reuse by microfiltration of the backwash water was and still is demonstrated on a large scale by Erlanger Stadtwerke AG (ESTW), a public-owned supplier of drinking water, electricity, heat and gas.

In this LIFE project through microfiltration and using a submerged membrane system, nearly all the backwash water is recovered and becomes reusable. The plant proves the ecological, economical and hygienic feasibility of membrane micro filtration in compliance with drinking water regulations.

The objectives were to:

- > Reclaim 99.9 % of the backwash water for use as drinking water (observing national and international hygienic requirements)
- > Investigate and optimise regeneration
- > Prove environmental benefits: minimised effluent and better disposal.
- > Prove economic viability in comparison to conventional discharge.

The project succeeded and showed that 99.85% of the backwash water could be recovered and used as drinking water - increasing the amount of drinking water and decreasing the amount of effluent. Savings were also made on energy consumption. Due to the very low pressure needed for the water to flow through the membranes, energy consumption is low (0.8 - 2 kWh/m³ of recovered drinking water).

The submerged membrane modules can be implemented in existing settling tanks, minimising the need for additional space and building. No sedimentation interval is needed. To prevent the development of a coating on the membrane, a cross-flow between the membrane modules is induced by strong aeration.

A follow-up report, carried out in April 2005 by the LIFE monitoring team, showed the plant is still running efficiently. The original set of membranes is still in use, which means considerable longer life span than originally planned. Also no other components had to be changed or spare parts implemented. This is also positive for the cost side.

Economically the costs for recovery are no higher than the effluent costs, making the technology cost neutral. According to the beneficiary, there is probably further room for optimisation (e.g. engineering costs for further plants will probably be lower), and so the technology is likely to be viable wherever discharge costs are high or drinking water is a scarce resource. Meanwhile the 2005 costs for membranes have dropped by about half in price and the technology is gaining ground in the market. In conclusion, the beneficiary is “very content” with both the plant and the technology.

Project Number:

LIFE98 ENV/D/000509

Beneficiary: Erlanger Stadtwerke AG

Total eligible cost: EUR 653,042.35

EC Contribution: EUR 221,992.22

Period: 02-Feb-1998 to 02-Sep-2001

3.3 Well ahead of the 2004 Environmental Technologies Action Plan (ETAP), LIFE funded innovative projects aimed at solving problems related to wastewater treatment

A large cluster of LIFE projects - 117 were aimed at the treatment of wastewater over the period 1992-2004, either at the public authority level or at the wider industry level.

In the preparation of its Communication on ETAP, published on 28 January 2004², the European Commission ran a series of stakeholder consultations, including one on water-related issues. One of the aims was to identify promising technologies for the treatment of wastewater. Among those, many, such as MBR technologies had already been trialled within the framework of the LIFE programme, in order to adapt them to specific problems or industries. The other technology presented here - geo-sanitation - was also considered an interesting innovation.

As an example of the former, a French project successfully demonstrated a new technique to produce large quantities of demineralised water from a local canal. Without funding from the LIFE programme or the regional water agency, the profitability of this process from a strict economical point-of-view was questionable. However, the beneficiary concluded that it was the environmental, rather than the economic benefits that distinguished this particular project.

² Communication from the Commission to the Council and the European Parliament - Stimulating Technologies for Sustainable Development: An Environmental Technologies Action Plan for the European Union [COM/2004/0038 final].

LIFE example: treatment of wastewater (1) “Demineralised water production from river water using membrane separation technology”

CERESTAR France S.A.S (a subsidiary of the international Cargill Group) manages an important corn starch factory in Haubourdin in the north of the country. This is an industry that requires large quantities of demineralised water in the different stages of the industrial process. For over 30 years, the plant has been using some 2 million m³ of city water annually for its industrial applications: water for steam boilers and process water. The city water was either softened or demineralised through a classical ion exchange resins process.

The purpose of this project was to demonstrate a new membrane separation technique which would produce 600,000 m³/year of demineralised canal water (canal de la Deûle). No chemical was used for the reverse osmosis treatment, except for the membrane cleaning and protection operations. This project formed part of a general policy adopted by the beneficiary, to utilise environmentally-friendly processes and to reduce water consumption.

The main objectives were:

- > To decrease city water consumption in the Haubourdin plant by at least 35%, by using water of a lower grade quality;
- > To substitute the classical demineralised water production process with a more environment-friendly technology: the reverse osmosis process eliminates the discharge of 2,300 kg/day salt (sodium chloride) into the canal; and
- > To implement a cheaper process for demineralising the water.

Despite some initial problems, the new process is now in operation and produces water with the quality required for the production of starch from maize. The water saving is in line with the original objectives: approximately 750,000 m³ of water is produced every year from surface water instead of being bought from the distribution network of drinking water. Furthermore, this process reduces the need to discharge salted waste (NaCl) into the canal by approximately 800 tons/year. The beneficiary concluded that while the project showed some economic benefits – saving over EUR 480,000, per annum, on an investment of around EUR 5.2 million – it would not have been viable without funding from the LIFE programme: “Therefore it is clearly the environmental, rather than the economic benefits that distinguish this project.”

Project Number:

LIFE96 ENV/F/000431

Beneficiary: CERESTAR France S.A.S (a subsidiary of the international Cargill Group)

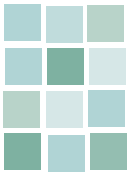
Total eligible cost: EUR 4,826,395.66

EC Contribution: EUR 771,762.55

Period: 25-Apr-1997 to 25-Apr-2000

Micro filtration of the backwash water offers an opportunity to conserve water for re-use.





In the next example, also in France, NGO, the REEVANER association, specialising in geo-sanitation - evapotranspiration of sewerage waters, successfully demonstrated an innovative individual, or semi-collective, wastewater treatment system in the tourist region of Languedoc-Roussillon. Significantly, its findings were presented to the 3rd World Water Forum in Kyoto (Japan) in March 2003.

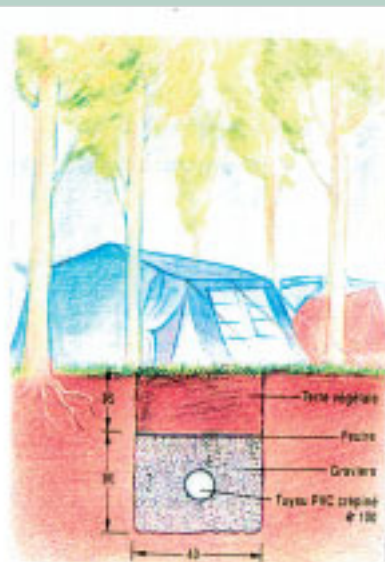
Several LIFE projects have looked at ways of improving the management of waste from ships in European ports and harbours. LIFE has also funded projects that examined ways of improving clean-up operations after major oil spills. One successful example is the Greek "Cleanmag" project.

Diagram to show evapotranspiration of wastewater at the Sérignan beach pilot site. (Sciences et Vie n° 831-1986)

LIFE example: treatment of wastewater (2) "Geo-sanitation - evapotranspiration of sewerage waters"

The goal of the project was to demonstrate the feasibility and reliability of an innovative individual, or semi-collective, wastewater treatment system for small seasonal or permanent communities in sensitive coastal areas. The demonstration was carried out in the Languedoc-Roussillon region, where tourism generates high population concentrations in a critical area which is of vital importance for the whole of the Mediterranean. Given this background, it was therefore essential to restore and preserve the functional role of the natural area, as well as to restore or maintain the quality of surface and ground water.

The LIFE-developed system operates as follows: sewerage arrives in a septic tank of 3 m³ for pre-treatment; after this first step the wastewater goes through a drain pipe of 100 mm diameter with side vents. The pipe is on the wide trench (0.9 to 0.8 metres) with rough gravel of 20-80 mm in diameter, these characteristics help prevent roots from invading the drains. The gravel bank acts as a buffer stock and lets water feed into the soil for plant use. Trees, shrubs and other plants, planted at between 0.5 and 3 metres from the drain axis, boost their growth by drawing on water in the soil and nutrients from the infiltration trenches.



© clichés Edgar Gartner

On project closure in 2003, it had achieved the following sustainable development results:

1. Environmental protection - waterways, lake, ponds, etc. were protected (no waste reached the upper levels), water resources were re-used (wastewater use for irrigation), space was saved (installations were integrated into the park and pathway areas), plant life developed and buildings blended into the landscape.
2. Economic development - the technique proved particularly well-suited to the development of inhabited areas in warm climates (it doesn't require power consumption and its investment costs are low in comparison with collective sanitation systems for small, isolated communities).
3. Social development - it also proved to be a technique well within the scope of communities with limited technological facilities.

Also in 2003, the beneficiary produced a series of brochures, in French: "Methodology Guide", "GEOASSEV, a rustic method for purifying domestic wastewater combining infiltration and evapotranspiration"; and the "Workshop programme: wastewater treatment and valorisation in tourist area. For more information, see the project website at: <http://www.reevanver.org/>

Project Number: LIFE00 ENV/F/000599
Beneficiary: REEVANVER
Total eligible cost: EUR 194,000.00
EC Contribution: EUR 86,421.00
Period: 06-Mar-2001 to 15-Apr-2003

LIFE example: clean-up after oil spills

“Demonstration and large scale application of the new magnetic method 'cleanmag' for the clean-up of waterborne oil spills”

In Greece, there is a high risk of oil spills, due to the country's geographic location at the crossroads of oil transportation sea routes. Hundreds of kilometres of bathing beaches in a large number of islands, tourist establishments as well as coastal fisheries are vulnerable to such potential tanker accidents as well as to routine oil releases. In addition, sea ports, especially those in the western Attica region close to oil refineries and other oil loading sea docks and large shipyards, are at great potential risk from oil spills.

The main project objective was the large scale application at open sea, of a new technique for cleaning up waterborne oil spills. This technique is based on the magnetic separation method of two liquid phases (one water and the other oil) by using the recently discovered and patented oleophilic magnetic oil absorbing material “CleanMag”. Other objectives were:

- > Large-scale production of the material CleanMag;
- > Design and construction of a prototype antipollution vessel equipped with a magnetic collection system;
- > Checking the performance of the technique by cleaning up experimental oil spills or residual oil pollution at several ports;
- > Evaluation of possibility for large scale recycling of the material as well as its toxicity, and its separation from oil.

The main environmental benefits associated with the project were as follows:

1. Full recovery of oils from oil spill accidents without leaving any residual oil pollution
2. Development of an environmentally benign technology since the CleanMag material is non-toxic and can be recycled;

3. An alternative to the use of chemical dispersants in related operations (which are toxic);
4. Application in other circumstances as well. For example, the material could be used to prevent oil spills from reaching and polluting the shore. Another application is the protection of wildlife and coastal areas after such accidents.

A follow-up ex-post evaluation carried out by the LIFE monitoring team, in July 2004, showed the following recent results:

1. Project partner, RAM-Europe (the makers of the belt and rotating drum used to pick up the material after it has absorbed the oil from the seawater) has finished another project using the CleanMag technology to protect the shore line from potential nearby oil spills. This was funded by PAVET 2000 (Programme Anaptyxis Viomichanikis Erevnas or Programme for the Development of Industrial Research) of the Greek government. For more information, see the company's website: <http://www.rameurope.com>;
2. The project leader has applied for a Registered Trademark for CleanMag from the Ministry of Commerce;
3. Investigation is underway regarding the establishment of a company to commercialise the material. In this case, 5% of the royalties would be given to the LIFE beneficiary;
4. The Union of Boatmen and Loaders of Santorini (a partner in this LIFE project) is looking to establish an environmental station on the Greek island of Santorini (Thira) for the protection of oil spills, using the CleanMag technology and the prototype anti-pollution boat, “CleanMag 1-NANCY” I, due to the fact that this island is located in the central Aegean close to the international routes of oil tankers coming from the Black Sea region and that the Union



Small boat used to study the behaviour of the CleanMag® magnetic drum in the sea.

participated in the demonstrated capabilities for oil spill clean up of the CleanMag technology.

5. After the presentation of the project results to the Management Committee for Marine Pollution of the EU, the Latvian authorities expressed interest in acquiring the technology. Similar interest has also been shown by authorities of Libya, Montenegro and Cyprus. See the project website: <http://www.teipir.gr/cleanmag/>

Project Number:

LIFE99 ENV/GR/000567

Beneficiary: TEI of Piraeus (technical University)

Total eligible cost: EUR 1,999,384.80

EC Contribution: EUR 920,947.40

Period: 01-Oct-1999 to 01-Jun-2003



3.4 LIFE has funded the development of new management tools allowing water authorities to better fulfil their objective of achieving good ecological status of water bodies by 2015

The need to restore rivers and floodplains has been increasingly acknowledged by the EU in recent years. The EU 5th and 6th EAP place high priority on restoring biodiversity. The EU Framework Directive on Water aims to achieve good status in all surface waters by 2011. River restoration is widely accepted as an effective means of both improving water quality and managing flooding problems, while at the same time leading to improvements to degraded aquatic systems, their biodiversity and amenity value.

Denmark's National Environmental Research Institute (NERI), headed up a particularly successful pan-European LIFE project to promote the exchange of information and experiences between local authorities at national and international level on river restoration.

ECRR (The European Centre for River Restoration) disseminates the LIFE experience to a Tokyo audience, 2005. (RWS-RIZA/ECRR secretariat)

LIFE example: development of new management tools for water authorities (1) "European Centre for River Restoration"

In recent years many river restoration projects have been undertaken. However, the exchange of information and experiences between local authorities both on a national and an international level is inadequate. In some countries (e.g. Denmark, Germany and the UK) national information centres have been established. But, there is a huge information gap on a European level and experiences and achievements cannot be easily exchanged.

The project's overall objective was to develop a European Centre for River Restoration (ECRR). The centre's role was to enhance restoration of rivers and riparian areas in Europe - following through the objectives of the Water Framework Directive by establishing networks, providing information and exchange of knowledge and experiences.

This provided benefits for the protection of biodiversity, flood defence and water quality in a cost-efficient way. The centre disseminated information on river restoration through newsletters, the Internet and scientific journals and a number of databases relevant to river restoration were established, e.g. database on projects, persons and institutions. The ECRR was also able to establish worldwide contacts with experience in the field of river restoration, thus increasing the cost effectiveness of river restoration in Europe and demonstrating clear benefits for ecological quality.

On project closure, 350 Institutions and individuals were participating in the ECRR network. National networks have been established in UK, Denmark, Romania, Russia, Italy, Spain and Norway. Further co-operation had been established with a number of other organisations, e.g. the Netherlands Centre for River studies, European Centre for Nature Restoration, WWF, Ramsar convention, IUCN and EIONET.

A follow-up ex-post evaluation, carried out by the LIFE monitoring team in May 2004, showed the results have lasted beyond the close of the project, as the network is still operating and has been strengthened. The secretariat has been taken over by RIZA (the Netherlands National Institute for Integrated Water Management and Wastewater Treatment), which has ensured financing until the end of 2005, after which its Italian counterpart has committed to continue the network. In this way it is estimated, that the network is ensured for the next five to ten years. Activities include the website, the newsletter and conferences. For example, ECRR, RIZA and Croatian Water hosted the 3rd International Conference on River Restoration - "River Restoration 2004:- Principles, processes & practices" held on 17-21 May 2004 in Zagreb, Croatia. For more information, visit the project website at:
<http://www.ecrr.org/>

Project Number:
LIFE99 ENV/DK/000619
Beneficiary: National Environmental Research Institute (NERI)
Total eligible cost: EUR 269,935.15
EC Contribution: EUR 133,622.04
Period: 01-Apr-1999 to 01-Apr-2002



LIFE example: development of new management tools for water authorities (2)
“Wise use of floodplains - a demonstration of techniques to evaluate and plan floodplain restoration”

This project concerned the international comparison of participative methods used in different types of catchment areas for the management of wetlands. Tools were tested, produced and disseminated. It was designed to help Member States implement the EU Water Framework Directive, by demonstrating how floodplains and their associated wetlands can contribute to sustainable management of water resources within river basins.

The project was implemented by a transnational partnership, involving the UK's Royal Society for the Protection of Birds, together with 13 other partners in six project areas in the United Kingdom and France. The project highlighted the importance of organisations and communities working together to create a holistic and sustainable approach to the management of water resources.

This vast array of stakeholders involved at different levels in the management of wetlands led to the development of a range of tools to aid floodplain managers to implement the Water Framework Directive.

Wildlife in the Carse of Stirling – Scotland's most extensive floodplain.

These included:

- > Participatory processes and appraisal techniques, including the innovative “Analysing Barriers to Change” (ABC) model, Hydrological modelling techniques - an overview guide for river basin managers;
- > Establishment of an international communication network between project stakeholders;
- > An action plan for each area to promote options for floodplain wetland restoration;
- > A series of national and European workshops, looking at changes needed in policy and practice. These were published in a report on “Opportunities and Barriers to Sustainable Management of Water”;
- > Website dissemination and promoting the findings of the project;
- > The presentation of key recommendations for European policy and funding changes needed to implement the Water Framework Directive at national and EU level.

The project's recommendations for floodplain management have been fed into guidance notes developed by the European Commission and Member States to aid the implementation of the Water Framework Directive, and have formed the basis of lobbying in a variety of related policy areas. Teams running floodplain catchment projects throughout Europe are using the results of this project to shape their work, and work is being undertaken within the catchments targeted by the project to turn the project recommendations into real action. For more information, see the project website at: <http://www.floodplains.org/>

Project Number:

LIFE99 ENV/UK/000203

Beneficiary: The Royal Society for the Protection of Birds

Total eligible cost: EUR 2,108,110.30

EC Contribution: EUR 1,052,044.45

Period: 01-Apr-1999 to 01-Apr-2002

A second exemplary project was carried out in the UK by the Royal Society for the Protection of Birds (RSPB), Europe's largest wildlife conservation charity. The RSPB brought together 14 partners from France, Ireland and the UK to provide comparative analysis of the wetland management methods used in different catchment areas.

3.5 LIFE has contributed to raising European public awareness of the need to manage water as a precious resource

Lack of water is not only caused by low or unequal concentrations of rainfall. It is directly related to excess consumption. In some western European countries, water use fell during the 1990s as a result of focus on water saving, increased metering, and the use of economic instruments (water charges and tariffs). In other western European countries, urban water use has continued to increase as a result of more people being connected to water supply systems, more households and changes to more water-consuming lifestyles (more washing machines, baths, swimming pools etc). According to data from the European Environment Agency [source: European Water Association 2002] the largest amount of household water used is found in Spain with 265 litres/capita/day. The policy of attempting to increase the supply of water as a response to increasing demand is clearly no longer sustainable. Spanish campaigns aimed at consumers have been carried out during periods of drought. But they have not attempted to introduce technical water-saving devices as part of the strategy. As a result the population has quickly returned to increased consumption once the particular crisis was over.





Among the small cluster (eight) LIFE co-funded initiatives in this field, a project for the city of Zaragoza (located between Madrid and Barcelona) demonstrated the effectiveness of an integrated campaign, together with other local authority initiatives, in raising public awareness of the need to reduce water consumption.



Zaragoza's water-saving campaign logo

Lack of water in Spain is not only due to low rainfall... but is directly related to excess consumption.



LIFE example: raising public awareness of the need to manage water "Zaragoza: water saving city. Small steps, big solutions"

The project aimed to achieve long-lasting changes in consumption patterns through the use of new technology. The challenge presented to the whole community was: to save 1,000 million litres of water in one year in Zaragoza City. This would be achieved through a concerted effort by all parties. The project involved government, social bodies, business and consumers. The project also aimed to create a "Water Saving City", and therefore also proposed discussions on reducing consumption in other urban uses (parks and gardens, industries, piping, etc.).

The project took the form of an awareness campaign with specific targets set for the consumer. These included:

- > Purchase of new water-saving sanitary-ware enabling households to save water;
- > Replacement of old public sanitary-ware with water-saving units;
- > Purchase of domestic appliances with built-in water savers;
- > Installation of meters for hot water;
- > Introduction of various measures and devices which would make it possible to save water (repairing leaks, reusing domestic water, etc.); and
- > Generally encouraging people to change their water-consumption habits.

The campaign ended in 1999, with an international symposium on 25 January, on the effective use of water in an urban environment. This project, in which 150 organisations and 183 schools actively participated, achieved a saving of 1,176 thousand million litres of water in 1998. At project closure, more than 140 companies in the city were marketing water-saving products and two-thirds of the shops were selling water-saving sanitary-ware, taps, domestic appliance and meters etc, (usually by giving discounts on water-saving products and devices). Sales of domestic appliances with built-in water savers increased by 15%. Four times as many individual meters and six times as many water-saving taps were sold.

Before the campaign, only one household in three practised any kind of water-saving measure (a device or consumption habit). At the end of the project, this had increased to two out of three.

Having achieved so much, it was important to keep the momentum of the project going: knowing that the awareness campaign was only a first step, the partners subsequently launched a new, more targeted, phase based on investments by large water consumers (public and private buildings, industries, parks and gardens). As the LIFE-Environment project had ended, a new partnership was put in place, comprising the LIFE project partners together with ACESA, a public water management agency of the Ebre basin in Catalonia, and the international foundation AVINA, active in sustainable development projects.

The LIFE project paved the way for further projects in Zaragoza and at the national and international level. According to a follow-up report carried out in February 2005 by the LIFE monitoring team, these have had, and continue to have, a positive impact: with direct repercussions for the environment, influencing attitudes, policy-making, public and industrial awareness, and showing economical benefits. The latest initiative, "School for the efficient use of water in the city" is seeking to widen the impact of efficient water use and management in the city, in order to make Zaragoza a "reference city" for the whole of Spain in the area of water-management. The recent designation of the city as the venue for the 2008 International Exhibition (focusing on: "Water and Sustainable Development") is an additional strong incentive.

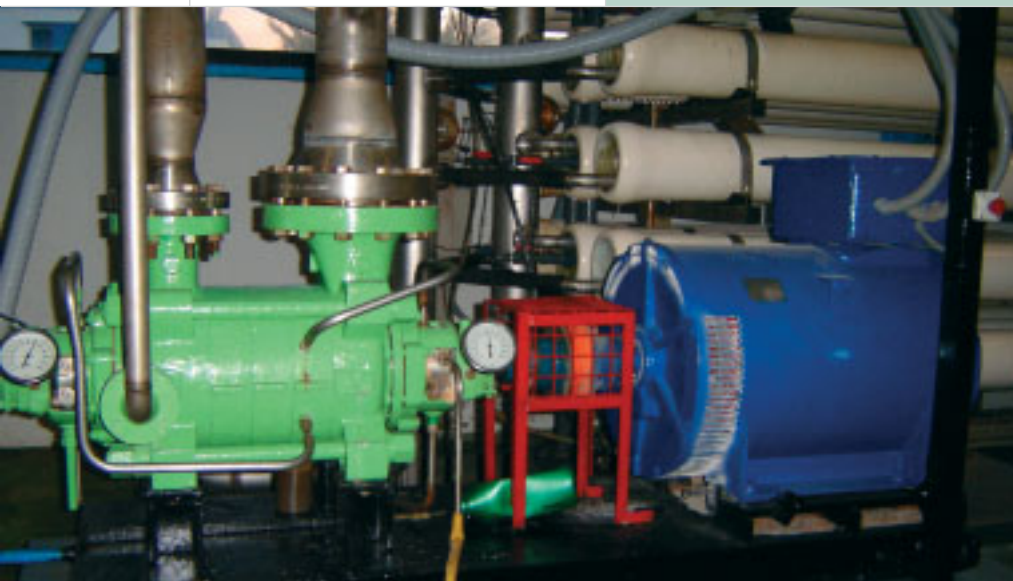
Following the success of the LIFE website, a new website has been created. See: <http://www.agua-dulce.org/>

Project Number: LIFE96 ENV/E/000509
Beneficiary: Fundación Ecología y Desarrollo
Total eligible cost: EUR 482,563.65
EC Contribution: EUR 240,115.34
Period: 01-Feb-1997 to 30-Nov-1998

3.6 LIFE provided innovative solutions to water supply problems, adapted to local conditions.

Despite the fact that, unlike many other regions of the world, most of Europe does not have major problems of water supply, there are many local circumstances where the availability of fresh water supply and/or drinking water is difficult to guarantee. The following example from Grand Canary illustrates the need for innovative solutions adapted to local conditions. Here, the beneficiary Hidráulica Maspalomas S.A. (now: ELMASA), a producer and supplier of drinking water, installed what it claims is the first full-scale plant in the world devoted to the re-use waste brine from a desalination plant. The results obtained have lasted well beyond the project's end and have led to the extension of the desalination plant and the subsequent development of the company business.

ELMASA's seawater desalination plant in Grand Canary Isles, Spain.



LIFE example: innovative solutions adapted to local conditions (1) “Production of fresh water by the reuse of the brine blow-down from seawater desalting plants”

Some countries that lack sufficient surface and ground water resources have turned increasingly to seawater desalination plants to increase their drinking water supply. However, these plants are both inefficient and create serious environmental problems. These include high energy consumption (requiring between 5 and 6 kWh to produce 1 m³ of desalted water), elevated use of chemical products and a 60% waste production rate in the form of brine which is returned to the sea.

This Grand Canary Isles (Spain) project successfully developed a recycling system based on the use of a new model of Reverse Osmosis Membrane that could support a much higher pressure than the standard ones. This resulted in a more environmentally-friendly desalination process, by reducing the unit energy consumption and by achieving zero consumption of chemicals through using previously treated waste brine. The model of the membrane is part of new ‘concentrator units’ that were specially designed for the project. The process has also produced a much lower unit investment cost, with the removal of the need for seawater extraction.

When the project terminated it produced the following results:

- > An increase in overall fresh water recovery from 40% to 60%; and
- > A substantial reduction in energy consumption of 0.74 kWh, as well as a 33% saving in chemicals' use. (2,600 kg of Ferric Chloride, 5,4000 kg of Sulphuric Acid, 7,000 kg of Sodium Hexametaphosphate and 17,500 kg of Sodium Hypochlorite.)

A further benefit was the reduction in the amount of brackish (slightly briny or salty) water that needed to be extracted from the wells, by 1 million m³ per year, helping to slow down the drop in the water level and to decrease the seepage of seawater into the wells.

The company has continued to develop its production activity, based on the use of this process, as it proved highly profitable both in economic and environmental terms. A follow-up ex-post evaluation, carried out by the LIFE monitoring team in January 2005, showed that in five years the company has increased its production from 8,250 m³/day to 22,000-23,000 m³/day. It has also added two more traditional RO Units (with a production rate of 4,500 and 2,800 m³/day), together with the three new concentrator units. This has resulted in 15,000 m³ of water produced per day through the RO units, plus an additional 50% of this volume produced through the brine treatment in the concentrators, which means an overall production of 22,000 m³/day;

Finally, the beneficiary reported that the project has already been replicated twice in the Canary Islands. It has been also implemented in Ibiza (Balears Island, Spain), Ceuta (Spain), Tortola (British Virgin Island), Curaçao (Caribbean Island) and several times in Japan.

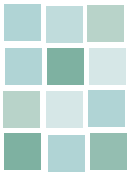
Project Number:

LIFE99 ENV/E/000335

Beneficiary: Hidráulica Maspalomas S.A.

Total eligible cost: EUR 1,004,933.11

EC Contribution: EUR 150,612.53



To conclude therefore, the previous sections have hopefully provided a clear indication of the way LIFE-Environment projects helped steer innovation and development in this area between 1992 and 2004. "What field are we in?" focuses on the background and key environmental issues related to water in Europe, including the 6th EAP and the framework Directive on water, supported by pertinent facts and figures from recent EEA publications. The question "How was the LIFE funding allocated?" is answered by tables and figures outlining the distribution of funding and number of projects for the four generic sub-themes identified from the LIFE database of projects. The question "What were the main impacts of the LIFE programme?" is answered by six key messages – supported by a wide range of successful projects from different Member States – demonstrating environmental innovation and confirming the indirect contributions of the LIFE programme to European policy-making in this field .

4. Looking ahead: LIFE-Environment in 2005 and onwards ...

The 6th EAP places a high priority on ensuring the sustainable use and high quality of our water resources – "to achieve levels of water quality that do not give rise to unacceptable impacts on, and risks to, human health and the environment and to ensure the rates of extraction from our water resources are sustainable over the long term".

Looking to the near future, as laid down in the LIFE-Environment application guide 2005, the priorities for LIFE funding are projects concerning the sustainable management of groundwater and surface waters. Particular attention will be given to projects that promote a coherent sustainable and integrated approach to water management in line with the orientations and recommendations of the Water Framework Directive (Directive 2000/60/EC) establishing a framework for Community action in the field of water policy.

1. Impact of agricultural and forest practices on water quality with regard to the consequences on river basin management (surface and groundwater) and marine environment (eutrophication). This includes issues of pesticides, nutrient pollution and eutrophication, nitrogen balances in grassland and arable land taking into account quantitative aspects relevant to integrated water management;
2. Improvements in wastewater management and treatment technologies with a view to increased quality of effluent and re-use needs. Re-use of 'greywater' (wastewater from other domestic usage such as washing, bathing, cooking etc..) including rainwater, and the re-use of agricultural drainage water;
3. Phasing out, cessation of discharges and emissions, and losses of hazardous substances;
4. Flood prevention and control in the context of river basin management.



Prototype anti-pollution boat equipped with the CleanMag® technology.

4.3: Minimizing the environmental impact of economic activities



1. What field are we in?

Industrial pollution has decreased substantially over the past 30 years in most western European (WE) countries and over the past 15 years in the central and eastern European (CEE) countries. As industry consists of large and easily identifiable point sources of pollution, it has always been a prime target of environmental policy.

EU policy for the environmental impact of economic activities acts through a broad and comprehensive set of instruments. The most important legislation includes the Directive on integrated pollution prevention and control (IPPC), which is the cornerstone of EU legislation addressing industrial installations with high pollution potential¹. Another central piece is the Eco-Management and Audit Scheme (EMAS)²; the Commission set up this scheme as part of the EU's policy on encouraging voluntary action for the environment.

Industrial pollution: a prime target of environmental policy.

The LIFE programme has been another central aspect of the EU strategy for stimulating innovation when addressing environmental impacts. From the very beginning in 1992, the LIFE programme financed projects minimizing the environmental impact of economic activities. The projects cover an extremely broad area ranging from the demonstration of innovative clean technologies in various types of industry and other economic sectors, to the development and optimisation of methods for monitoring and managing environmental impacts.

¹ Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control [OJ L 257, 10/10/1996 P. 0026-0040]

² Eco-Management and Audit Scheme (EMAS) - Regulation (EC) No 761/2001 [O J L114 , 24.4.2001, p.1].

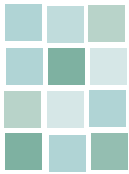
Industrial output is growing but eco-efficiency is generally improving

“Around 75% of industrial pollution indicators (air emission, water and energy use) show improvement between 1992 and 1999”

Manufacturing remains important for the economy in Europe and especially in the 12 countries of eastern Europe, the Caucasus and central Asia (EECCA). Industrial output is growing throughout Europe but eco-efficiency is generally improving. Although industrial energy use in western European countries is growing slowly, productivity is growing more rapidly, so energy efficiency is improving. In central and eastern Europe, energy efficiency is improving at a faster rate, but remains well below that in western Europe, while industry in EECCA is still seven times more energy intensive than that in the west. The main challenge in western Europe is to ensure better protection of the environment while maintaining a competitive industrial base. In central and eastern Europe, major investments are needed to raise the environmental performance of industry to the standards required by the accession process. In EECCA, the main challenge is to build an appropriate regulatory framework and improve enforcement.

On the basis of a limited set of indicators for industrial pollution, the EEA concluded that a decoupling of industrial growth from environmental pressure was achieved for all indicators in the EU-15, Hungary and Slovenia over 1990 to 1999. Although in general pollution is decreasing, this decoupling has not been achieved for all selected indicators in the other countries.

[Source: Europe's environment: the third assessment, EEA, 2003]



2. How was the LIFE funding allocated?

Some statistical information on LIFE and minimizing the environmental impact of economic activities

As the table shows, 441 out of 1,404 (31%) LIFE-Environment I, II and III projects were undertaken specifically on issues related to minimizing the environmental impact of economic activities between 1992 and 2004. The total investment planned by those projects (many are still ongoing) is EUR 698.15 million for a Community contribution of EUR 199.16 million. The "leverage" capacity of this type of project is particularly important, as one euro invested by the EU will be matched by over two euros from other private and public funds. The sector is also the largest, both in number of projects and in the amount of LIFE money invested in them.

The largest number of projects deals with clean technologies: 161 projects, 37% of the total. These are typically large projects implemented by industry in which emerging technologies are demonstrated for the first time on full scale. LIFE typically co-funds these projects at 30% of the eligible costs; the average EC contribution is 23% of the total project costs.

The second largest cluster of projects is those covering integrated environment management: 126 projects – 29% of the total. These LIFE projects implement environmental management systems (EMAS) in a variety of sectors. The average project cost is EUR 1.07 million, many of these projects are co-funded by LIFE at 50% of the eligible costs. The average EC contribution is 43% of the total project costs.

The third largest cluster of projects aims to reduce the emission of air pollutants. There were 50 such projects over the period 1992-2004. These schemes are similar to the clean technologies projects: they are typically implemented by industry at a LIFE co-funding of 30% of the eligible costs.

The fourth and fifth cluster of projects address schemes that develop and apply innovative methods for the monitoring, decontamination and risk management of polluted sites. The sixth cluster of projects contains a relatively small number of projects that focus on greenhouse gases.

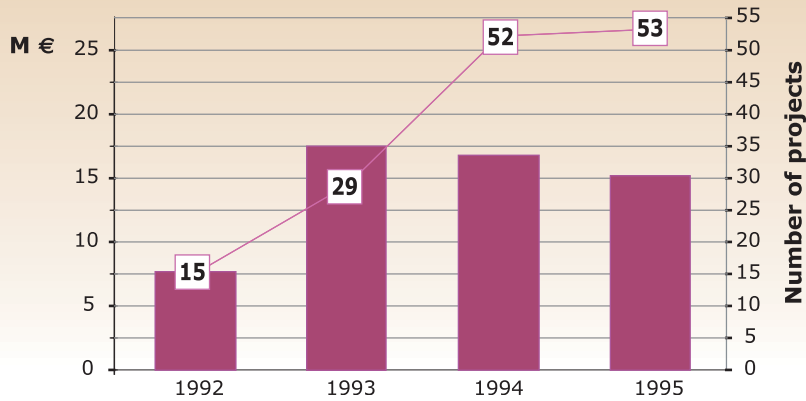
Analysing the overall trends for projects in this field, it appeared that of the three approaches identified, LIFE beneficiaries mainly developed technology-oriented projects (61%) – due largely to the importance of clean technologies, followed by methods-oriented projects (36%) and awareness-raising and participatory projects (3%).

Table 3: Minimizing the environmental impact of economic activities projects financed by LIFE-Environment 1992-2004

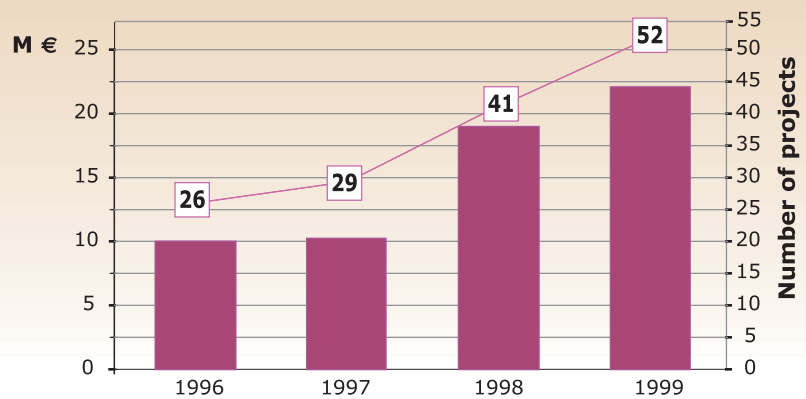
Minimizing the environmental impact of Economic activities projects by sector (1992-2004)	Number of Projects financed	Total cost of projects (EUR Million)	Total EC Contribution (EUR Million)	Percentage EC contribution	Average cost per project (EUR Million)
Clean technologies	161	315.86	72.59	23%	1.96
Integrated environment management	126	135.11	58.53	43%	1.07
Reduction of emission of greenhouse gases	16	30.50	7.39	24%	1.91
Reduction of emission of air pollutants	50	87.75	20.57	23%	1.76
Risk assessment – Pollution control	42	46.24	17.29	37%	1.10
Site rehabilitation – Decontamination	45	81.68	22.50	28%	1.81
Other area - Impact of economic activities	1	1.00	0.29	29%	1.00
TOTAL/MEAN	441	698.15	199.16	29%	1.58

Impact of economic activities - Industrial Processes

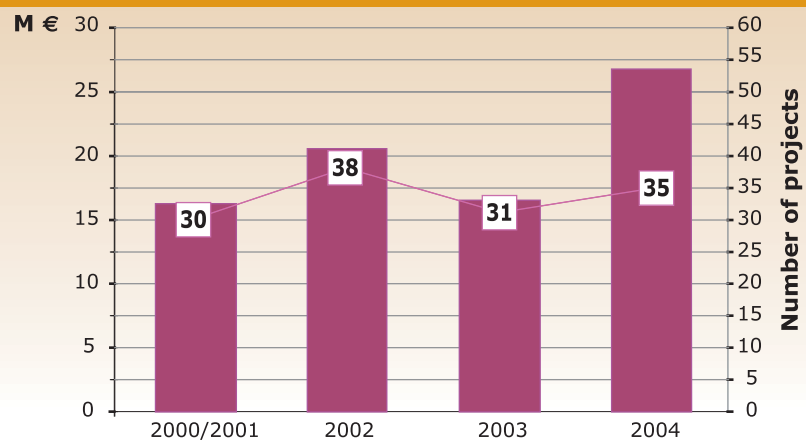
LIFE I



LIFE II

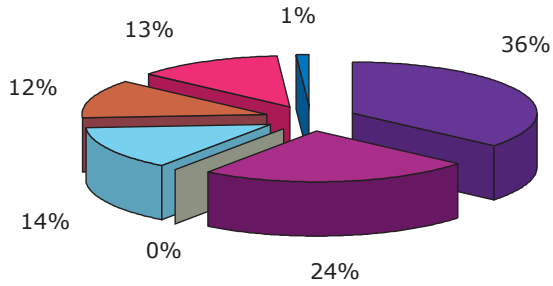
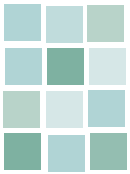


LIFE III

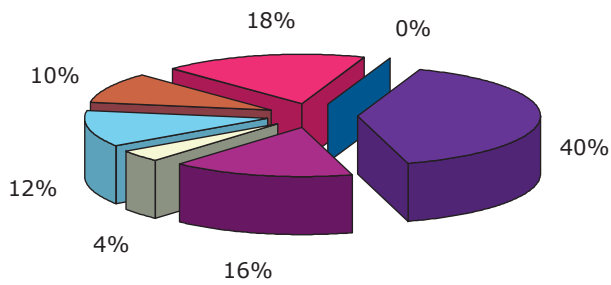


X Number of projects ■ EU contribution in Million EUR

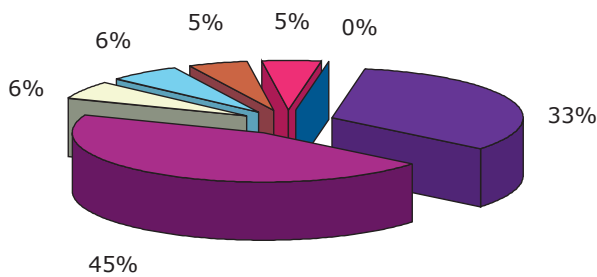
Figure 11-a. Minimizing the environmental impact of economic activities projects in EUR million for LIFE I to LIFE III to 2004, with line superimposed to illustrate the total number of projects in this field for that year.



**LIFE I -
EU total funding in %**



**LIFE II -
EU total funding in %**



**LIFE III -
EU total funding in %**

- | | |
|---|--|
| Clean technologies | Risk assessment |
| Integrated environment management | Pollution control |
| Reduction of emission of greenhouse gases | Site rehabilitation |
| Reduction of emission of air pollutants | Decontamination |
| | Other area - Impact of economic activities |

Figure 11-b. Minimizing the environmental impact of economic activities – percentage of EC co-funding by sub-sector in LIFE I to LIFE III to 2004.

3. What was the main impact of the LIFE programme in this area?

3.1 LIFE has supported the demonstration of innovative clean technologies, ahead of ETAP

From the outset, LIFE supported the demonstration of innovative technologies aiming to reduce the environmental impact of economic activities. These technologies vary in theme addressed (waste, energy efficiency, air pollutants etc, or a combination of themes), in scope (some can be applied throughout different sectors while others are only applicable in one specific sector), and in maturity (some are already in use, while others are still on the drawing board).

Ahead of the 2004 Environmental Technologies Action Plan³, LIFE helped environmental technologies overcome several obstacles to their development and diffusion.

³ On 28 January 2004, the Commission adopted the Environmental Technologies Action Plan ETAP). It was prepared by the Commission services for Research and for Environment, with the co-operation of other services for specific actions. ETAP is an ambitious plan to further environmental technologies within the EU and globally. It is based on the recognition that there is significant untapped technological potential for improving the environment while contributing to competitiveness and growth. See: EC Environment (ETAP homepage) at: <http://europa.eu.int/comm/environment/etap/index.htm>.

The 'super-critical' wood impregnation technique.

LIFE example: supporting innovative clean technologies (1) "Super critical wood impregnation"

Wood is an environmentally attractive building material, but for some uses it has to be preserved by impregnation with fungicides and pesticides. Conventional impregnation methods use heavy metals and organic solvents, both undesirable pollutants. Instead of impregnating wood with these pollutants, the wood could be treated by so-called 'super critical' wood impregnation. This technique would replace organic solvents with safe alternatives, such as CO₂ (carbon dioxide). This would reduce the environmental strain while enhancing the pureness and quality of the product.

The aim of this project, by worldwide engineering and manufacturing group FLS Industries A/S, was to demonstrate in a full-scale installation, with a capacity of 30,000 m³ of wood per year, the impregnation of wood with organic fungicides using this new super critical CO₂ technique.

The technique had already been developed using laboratory scale equipment, where wood that was difficult to impregnate by conventional techniques was treated with organic fungicides (tebuconazole and propiconazole) using super critical CO₂. These successful tests showed outstanding penetration properties and demonstrated the attractive environmentally-friendly profile of super critical CO₂. The results encouraged the beneficiary, with the aid of LIFE co-funding, to conduct a full-scale demonstration of the technique. This had never before been carried out.

The project successfully demonstrated the new super-critical impregnation technique. The innovative technique is now being used commercially at the group's "Supertrae" (Superwood) plant in Denmark - the world's first environmentally neutral production plant for impregnation of wood.

The special high-pressure treatment method allows impregnation of wood without use of heavy metals, and without leaving traces of organic solvents in the wood. The only agent that is applied to the wood is a fungicide, which now penetrates right into the wood as a result of the innovative technology. Therefore it is possible to treat the surface of the wood, without destroying the impregnation effect. Moreover, this new method allows treatment of all types of wood, not only coniferous, as was the case with conventional treatment techniques.

The new impregnation plant based on the technology developed is operational and in commercially productive use in Jutland, Denmark.

See: <http://www.supertrae.dk>.

Project Number:

LIFE99 ENV/DK/000614

Beneficiary: FLS Miljoe A/S

Total eligible cost: EUR 7,462,298.17

EC Contribution: EUR 941,872.98

Period: 01-Aug-1999 to 01-Aug-2002





For example, investments in innovative environmental technologies are often perceived as risky, especially in the pilot stage; LIFE helped overcome this economic barrier by providing a financial contribution for the pilot stage. Another example: the biggest barrier to diffusion is the lack of information about potential environmental technologies. LIFE addressed this barrier by requiring that dissemination activities be undertaken in every project, and by putting in place central communication activities disclosing information on every single project.

Over the period 1992-2004, LIFE co-funded 161 clean technologies projects. Another 50 projects focused on technologies aimed at reducing air emissions. The project details (see the projects database on the LIFE website) show that these technologies address all types of emissions in a large number of economic sectors.

One successful example is the "Supertræ" (Superwood) project, which won the 2002 EU environmental award for Denmark, in the clean technologies category, as an acknowledgement of the environmentally beneficial results it achieved.

A second successful project in this category is a German clean technologies' waste-management project concerned with the recycling of disc or drum brake liners used in vehicle brakes.



LIFE example: supporting innovative clean technologies (2) "Pilot realization of the material cycle of friction materials"

Friction liners (disc, or drum brake liners) are mainly used in vehicle brakes. The volume of friction liners produced in Europe amounts to 150,000 tonnes/annum. When they need replacing, the used liners are normally disposed of as hazardous waste or partially smelted to produce low-quality steel. In addition to the used liners, approximately 22,000 tonnes of filter dust from the industrial production of friction liners has to be disposed of annually⁴.

The project's aim was to develop a new system for reprocessing both used friction liners and filter dust accumulated during the production process. This would reduce the volume of waste going to disposal sites, reduce the use of raw material and as a result, reduce the disposal costs and the cost of friction liner material.

Based on the results of an earlier research project, which had examined the redistribution of friction materials on a laboratory scale, the LIFE project sought to demonstrate larger-scale production. Another important objective was to demonstrate the complete material cycle 'from cradle-to-grave', from the production of the friction liner, its subsequent application in the car, its collection and recycling after use, and finally to its re-use in the manufacturing of new friction liners and their distribution. Collection and redistribution was also an important pre-condition to closing the cycle and ensuring the environmental benefits.

When the project terminated, the results showed that the regular production of high-quality recycled base material from used friction linings was successful. A system for collection of used linings and redistribution of recycled base material was also achieved. During the LIFE project the material cycle was limited to Germany. However, throughout the whole project and in particular towards the project end, the beneficiary intensified efforts to develop markets for recycled material on an international as well as a local level.

As a result, a subsequent ex-post evaluation of the project, carried out by the LIFE monitoring team in July 2004, showed that the collection of recyclable waste material has been extended to regions in the Netherlands, Belgium, Austria, France and Italy. In addition, the recycled base material is now being shipped to France, England and Sweden to be used for the production of new friction liners.

The beneficiary concludes that "the outlook is positive", although the amount of recycled material does not fully load the total capacity of the plant. The company notes that friction lining companies (i.e. the car manufacturers) are reluctant to invest and re-use the available recycled material, because they are currently legally not obliged to re-use. However, legal pressure is growing (e.g. Directive 2000/53/EC on end-of-life vehicles) and at the same time the costs of waste disposal are increasing. The company sees itself as ideally placed to be able to capitalise on a changing political climate as car manufacturers have to look for environmentally-friendly re-use and disposal options for components.

Project Number: LIFE98 ENV/D/000537
Beneficiary: RR Reibstoff Recycling GmbH & Co KG
Total eligible cost: EUR 2,595,050.69
EC Contribution: EUR 632,828.15
Period: 01-Feb-1998 to 01-Feb-2001

Friction liners are mainly used in vehicle brakes.

⁴ Figures for 1998, supplied by project beneficiary

3.2 LIFE has helped IPPC sectors to develop and demonstrate emerging clean technologies at a European level

One series of LIFE projects is directly linked to the implementation of the integrated pollution prevention and control directive (IPPC). The IPPC Directive⁵ aims at a high level of environmental protection for the operation of about 50,000 industrial installations in the EU. The Directive requires that all installations operate according to an integrated permit containing operating conditions based on "best available techniques" (BAT)⁶. These techniques are described for each sector in BAT reference documents (the so-called "BREF") published by the Commission (see <http://eippcb.jrc.es/>).

A large number of LIFE projects have been implemented in sectors covered by the IPPC Directive. Analysis of the LIFE projects' database, carried out in 2003, showed that this concerned 248 projects of the 1,200 LIFE-Environment projects implemented, or 20%. Fig. 12 shows the sectors involved. Some of these projects addressed innovative solutions for one specific environmental aspect, such as wastewater or air pollutants, others addressed combinations of these aspects, or a full integrated approach.

LIFE-Environment projects by IPPC sectors

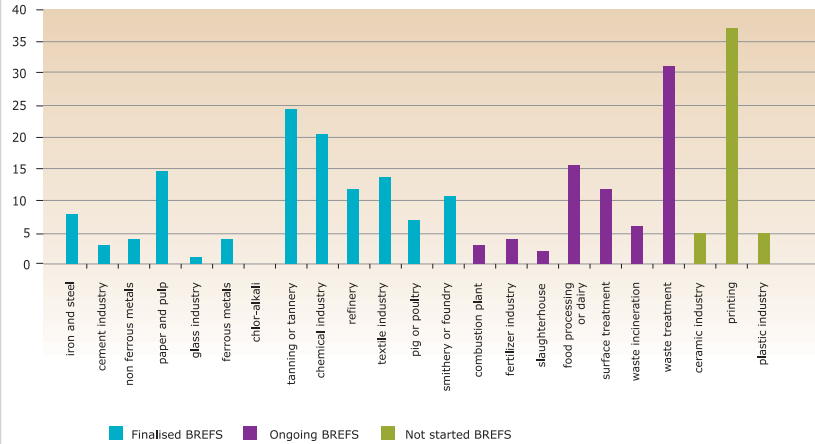


Figure 12. Total number of LIFE-Environment projects 1992-2004 by IPPC sectors.

In such projects, LIFE stimulates the exchange of information and innovative experiments and highlights the relevance of emerging technologies, including those that are insufficiently developed or implemented. Several LIFE projects in various sectors are referred to in the BREF documents.

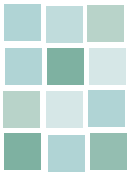
The following two examples are directly linked with the implementation of the integrated pollution prevention and control directive (IPPC). The first concerns a UK LIFE project in the tannery sector. This successful project was commended in the BAT reference documents "BREF" of the IPPC Directive. The second concerns a Spanish project to reduce waste from aluminium slag refining.



Industrial paint for shock absorbers, Netherlands.

⁵ Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control [OJ L 257, 10/10/1996 p. 0026 – 0040].

⁶ Best Available Techniques (or BAT), which is defined in Article 2 of the IPPC Directive.



LIFE example: projects linked to IPPC (1)

“Demonstration project for the extensive introduction of clean technologies, conservation of raw materials and optimisation of production processes in tanneries”

The objective of the project was to demonstrate on a full technical scale a series of cleaner technologies in the tanning sector in Europe. Several cleaner technologies had become available but were not widely used in the leather industry. In order to sustain the tanning sector in Europe it is recognised that environment has to be managed and (new) environmentally sound technologies have to be applied.

The tanning industry in Europe faces intense international competition from South East Asia and South America and at the same time faces a particular and unavoidable environmental challenge – 80% of the weight of a raw hide becomes waste – either liquid or solid – and only 20% becomes finished leather. In addition, every tonne of raw hide produces an average of 500 kg of sludge from effluent treatment.

Industrial scale membrane bioreactor and reverse osmosis plant.

This illustrates why adoption of cost effective clean technologies is essential for the European leather industry; and that ‘end-of-pipe’ treatment alone is not a viable solution.

The many technologies demonstrated and promoted in the project included: Short-term preservation methods minimising salt – chilling and icing of hides; Recycling of soak liquors; Reduction of sulphide; Hair-save technologies; Recycling spent sulphide liquors; Lime Splitting; Carbon dioxide deliming; Recycling pickle liquors; Salt-free pickling; Increase of the efficiency of chrome tanning; High exhaustion chrome tanning; Direct recycling of chrome tanning liquor; Chrome recovery through precipitation and separation; Through-feed dyeing of leather; High volume low pressure (HVLP) spraying equipment; Roller coating machine; Reduction of VOCs in finishing; Use of Membrane technologies for effluent treatment; and Gasification of solid wastes for energy generation.

A deliverable from the project was also a Design Support Tool (DST). The DST is a relational database designed for the management of a tannery to:

- > Help conduct an audit of the environmental performance of the tannery; and
- > Identify and evaluate cleaner production options that can be implemented to reduce wastes and emissions.

The main result and legacy of the project is that it added substantially to the body of knowledge available to and widely understood in the industry, of available clean technologies, with examples of practical applications of these technologies. All of the above technologies are commonly used today in the European tanning industry and all feature in the sector BREF⁷ reference documents – to which the project team, made a significant contribution. Moreover, the Design Support Tool has been utilised by a number of the larger tanneries that are now accredited to ISO 14000.

Technologies where particular progress has been made are the use of membranes for effluent treatment and recovery/recycling of – for example – chromium and process water, and gasification of tannery wastes, which incorporates chromium recovery and energy generation. Both technologies are available on a commercial basis and membrane technology was used to produce salt-free water of drinking quality from tannery effluent at the municipal waterworks at Lorca – the site of a tannery complex in Spain.

Project Number:

LIFE94 ENV/UK/000494

Beneficiary: BLC the Leather

Technology Centre Ltd

Total eligible cost: EUR 1,019,150.90

EC Contribution: EUR 476,121.85

Period: 01-Nov-1994 to 31-Oct-1997

⁷ BREF - Reference Document on Best Available Techniques for the Tanning of Hides and Skins, European Commission, February 2003.



LIFE example: projects linked to IPPC (2)

“Minimising the production of waste in an aluminium slag recovery process”

ALUMINIO Catalan, S.A. (Alcasa) was established in 1981 as an aluminium refinery. Its main activity is the refining of scrap aluminium and slag by melting it down for subsequent use in smelting plants, generally for the manufacture of parts for the automobile industry and related sectors. Recovery of aluminium is important both in environmental and energy terms, since it prevents the generation of waste and at the same time reduces the need to obtain aluminium by primary smelting, the cost of which is extremely high.

In 1998, Alcasa's aluminium slag recovery process was generating a total volume of 20,926 tonnes of waste per year (potassium chloride, aluminium, fines and other minority elements). The annual cost of disposing this was EUR 880,000.

The proposed solution to this involved the primary grinding of the slag, using a bar impact mill without grates and with deflecting plates, with a selection process removing any fragments larger than 100 mm at the exit point. These were then conveyed directly to fusion. A selection unit separated fragments measuring between 100 and 40 mm,

*Breaking new ground
in aluminium slag recovery.*

and those between 40 and 12 mm, continuously re-circulating them between the grinding unit and the selection unit. The final product resulting from this selection process is conveyed directly to fusion. Fragments measuring between 0 and 12 mm underwent secondary grinding in a bar mill until the optimum fusion calibre of between 12 and 0.6 mm was obtained. Fragments between 0 and 0.6 mm were separated out for disposal via a modern filtering system.

The objective of the project was to eliminate most of the impurities from the waste used in aluminium slag recovery, before starting the fusion process, thereby allowing for considerably less flux to be used and, as a result, the generation of far less waste through the fusion process and a reduction in the amount of hazardous waste. The ultimate aim was to considerably reduce the amount of toxic waste produced and so reduce the cost of waste management.

When the project closed in 1999, this process broke new ground in the aluminium slag recovery sector in Spain. Elimination of most of the impurities from the waste before starting the fusion process allowed considerably less flux to be used and, as a result, far less waste was generated through the fusion process and the amount of hazardous waste is also much reduced. The project also brought about a considerable reduction in the weight of toxic waste the company was producing and so cut the cost of waste management. A saving of 11 million tonnes of waste per year was achieved, disposal of which would have cost EUR 400,000. The project also contributed to the recycling goals set in the country's national waste plan.

Project Number:

LIFE98 ENV/E/000365

Beneficiary: ALUMINIO Catalan S.A.

Total eligible cost: EUR 1,344,680.44

EC Contribution: EUR 151,177.94

Period: 01-Jan-1998 to 01-Jul-1999

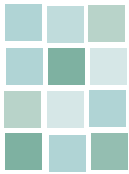
3.3 LIFE has encouraged the application of good practices in environmental management systems

In 1993, the European Commission adopted the Community Eco-Management Audit Scheme, or EMAS, in order to encourage voluntary certification on the part of industry. The EMAS scheme offers companies that are willing to commit themselves to a better management of their environment a flexible tool and a good cost-effective approach. Since it was reviewed in 2001, it has also been applicable to any public body which promotes “good governance” in the environmental sphere.

The LIFE programme has supported EMAS since it was launched. LIFE had a part to play in testing practical solutions. This is complementary to the necessary legislative measures in favour of organisations that have committed themselves to this course. LIFE had the financial resources to co-fund a series of practical projects to promote EMAS more widely and to encourage its application through new approaches.

Between 1992 and 2004, 126 LIFE projects addressed integrated environmental management. Most of these projects are directly linked to environmental management systems such as EMAS, some projects examine related issues such as environmental performance, benchmarking or accounting. A good example of the application of EMAS, concerns a Spanish LIFE project to develop a practical model of environmental management that could be easily applicable at municipality level and could foster the implementation of good environmental practices in all Spanish town councils.





Environmental management systems are becoming increasingly popular

The number of environmental management systems (EMS) in Europe grew by 160% between 1999 and 2002. There are two main systems: the ISO 14001 standards adopted worldwide, and the eco-management and audit scheme (EMAS) which has been set up by the EU. Nearly 40,000 certificates have been issued worldwide: around 36,000 ISO 14001 and nearly 4,000 EMAS. The EU accounts for almost 50% of these certificates worldwide. Most remarkable is the spectacular growth in ISO 14001 certificates in the accession countries — a six-fold increase since 1999.

The main reason for installing ISO 14001 or EMAS in companies is to achieve better relationships with regulators and clients. They are therefore important marketing tools and help in negotiations with governments on environmental regulations. The total administrative effort (for companies and society) in applying and running a typical company EMAS is between 0.7 and 1.2 person/months of work per year (Lulofs, 2000). Around 20 % of the costs are borne by the companies. Many small companies apply ISO 14001 or EMAS rules without actual certification because of the costs involved.

[Source: Europe's environment: the third assessment, EEA, 2003]

FEMP's handbook – the key to good environmental practices.

LIFE example: good practices in environmental management systems (1) "Elaboration of an Environmental Good Practice Guide driven to the normalisation of the environmental management in Spanish Local Administration"

The aim of the project, coordinated by the beneficiary FEMP (the main national representative organisation of Spanish Town Councils), was to create a handbook, or code of good environmental practices, for use by all town councils, with practical support to optimise the management of natural, material and human resources at a town council level. The handbook was also intended to create a more objective control of environmental quality by town councils, to facilitate communication among cities and citizens by standardising indicators, as well as securing a more effective overall improvement in the local environment.

The fields to be taken into account were firstly, the development of methodological tools for a local Agenda 21, involving a municipal environmental audit and a social participation plan and secondly, the adaptation of an environmental management system based on ISO 14000.

The project was carried out in five stages, finally resulting in the presentation of the "Code of Good Environmental Practice". This was a practical, simple tool for environmental management, based on ISO 14000 and Agenda 21, which could be easily applied in any local authority. It was the first time that such a tool has been developed in the EU.

The code covered three methodological areas: Municipal Environmental Audit (AMM), Social Action Plan (PAS) and Environmental Management System (EMAS /SIGMA). The first two consisted of a transfer of current good practice on Agenda 21 at a European and National level. The third section referred to the implementation of regulation ISO 14000 and involved a more innovative adaptation of the environmental management regulations to the specific context of a local authority. A key new area was the development of relevant indicators for evaluating environmental quality at local authority level. The final section included technical annexes and complementary information.

The project achieved a high impact among its target group (municipalities) and the media at local and national level, through a clearly-focused dissemination strategy. This included the development of a detailed communication plan and included a high-profile press conference in which over 30 media representatives participated (from press agencies, newspapers, magazines, national and local radio/ television).

The project was also presented at several important trade fairs including Ecomed-Pullutec (Barcelona-March,1999) and Feria Tem-Tecma (Madrid-June 2000), as well as in the Oviedo University summer school and through seminars in Córdoba, Cádiz and Madrid. The final presentation took place in Murcia in October 2000. More information on the project is available from the FEMP LIFE project website at: <http://www.femp.es/life/>

Project Number: LIFE98 ENV/E/000445
Beneficiary: Federación Española de Municipios y Provincias (FEMP)
Total eligible cost: EUR 519,584.52
EC Contribution: EUR 253,517.09
Period: 01-Nov-1998 to 01-Nov-2000





View across Italy's bustling Port of Livorno, showing the historic Marzocco Tower.

Another highly innovative example is Italy's EMASPOLI (EMAS Port of Livorno) management system – the first port authority in Europe to achieve EMAS registration thanks to LIFE funding.

LIFE example: good practices in environmental management systems (2) “Experimental testing and diffusion of EMS in the Port of Livorno”

Italy's Port of Livorno does business with all major ports world-wide. Every year, approximately 5,000 ships belonging to 200 shipping companies pass through the port, which handles 21 million tons of goods in 24 terminals. Around 6,000 people work directly in the port, which accounts for 7.8% of the local economy's GDP

The beneficiary, the Livorno Port Authority, together with its consultant Sintesis, implemented this project to improve and reduce environmental impacts of economic activities: Apart from container traffic the port also deals with bulk liquids and solids, motor vehicles, cellulose pulp and timber, general cargo, minerals and iron manufacturing products, cereals, fruit and frozen products.

The aim was to raise the level of environmental awareness in the port sector by disseminating the contents of the project and providing the opportunity for environmental certification. The Cinque Terre National Park is situated only 20 km away, which increased the pressure to find ways of minimizing the negative environmental impacts of port activities.

In 2001, the beneficiary submitted a preliminary report on the state of the environment in the port. This was the first step, followed by the environmental policy and the environmental declaration resulting in achieving an environmental management system in accordance with the EMAS regulation (761/2001/CE). EMAS II registration was finalised in October 2004.

The beneficiary is a member of the ECO-PORTS Foundation, a network platform where European ports' exchange environmental experience (see the website at: <http://www.ecoport.com>). This was a useful platform for the beneficiary, enabling it to find out about the initiatives and the best practices that are applied to ports at a European level, and to disseminate the results of the project. For more information on the project, visit: <http://www.emaspoli.it> and <http://www.portauthority.li.it/>.

Project Number:

LIFE02 ENV/IT/000015

Beneficiary: Autorita Portuale Livorno (Port Authority of Livorno)

Total eligible cost: EUR 293,356.00

EC Contribution: EUR 138,928.00

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



The EMAS projects sought to find ways of reducing the negative impacts of Port of Livorno activities.



3.4 LIFE has contributed to the reduction of emissions of air pollutants

This is an important sector for the LIFE programme with a large cluster of projects (50) directly linked to reducing air-borne pollution.



The installation of the filtration unit (shown here) made it possible to re-use the spent rinsing MMA twice before sending it to distillation. This resulted in a 50% reduction of the waste stream.



LIFE example: reducing emissions of air pollutants “Demonstration of environmentally-friendly cleaning fluid for the processing plants of Atoglas Nederland B.V.”

The project beneficiary was Atoglas B.V the Dutch subsidiary of Paris-based Atoglas Group - a world leader in the production of PMMA (acrylic sheets) by polymerisation of monomer methyl-methacrylate (MMA). (Atoglas is itself a subsidiary of Atofina, the TotalFinaElf chemicals group.)

The production of PMMA sheets takes place by batch. The piping, mixing vessel and de-aerating vessel are rinsed between each production batch, in order to ensure that there is no colour contamination. Prior to the launch of the LIFE project, the beneficiary was using a chlorinated solvent, DCM (Dichloromethane), for this rinsing/cleaning process. (DCM is a well-known air and water pollutant and is also toxic.) Under the framework of the IPPC Directive, companies' are required to report their DCM emission figures in the EPER register, if they exceed 1,000 kg/year. Atoglas had an emission 10 times higher than this threshold value.

The objective of this project therefore, was to replace DCM by a less toxic compound.

When the project closed, it had achieved the following impressive results: Firstly, it had successfully demonstrated the substitution of rinsing agent DCM by MMA, which is the monomer and basic raw material in the production of the PMMA sheets. Secondly, it demonstrated that it was possible to filter and re-use the spent rinsing MMA twice, leading to important cost reductions.

1. The beneficiary upgraded the cleaning process to a cleaning-in-process (CIP) system with MMA as cleansing agent. The use of DCM was completely abolished. MMA is now used to rinse pipelines and vessels in the closed system. After a rinsing cycle, the cleansing fluid is filtered in a cricket filter where the colour agents are absorbed on activated carbon, and then re-used. The whole system is entirely integrated in the production process.

2. The project generated considerable environmental results. By eliminating the chlorinated solvent DCM, its emissions of 10,000 kg/year were thus also completely eliminated. By installing the closed loop rinsing system, the MMA emissions-to-air were reduced by 97%. The installation of the filtration unit made it possible to re-use the spent rinsing MMA twice before sending it to distillation. This resulted in a 50% reduction of the waste stream.

Positive economic results were also achieved: the product quality was improved by eliminating the chlorinated cleansing agent DCM. This resulted in a decrease of quality claims while the production yield increased. The reported total benefit was 1%. The direct costs of the cleansing process decreased by 60% because the rinsing agent monomer MMA is re-used twice after filtration.

The demonstration value of this economical-environmental 'win-win' project is particularly high, as it was the first application within Atoglas and probably within this sector. Following the project termination, the beneficiary has sent its results to over 70 organisations across Europe, including national chemical sector organisations, the Atoglas sister companies, and companies in the polymer, adhesives and paint sectors. The IPPC bureau in Sevilla, Spain was also informed of the project's results. See, the company website at: <http://www.atoglas.com/>.

Project Number: LIFE98 ENV/NL/000189
Beneficiary: Atoglas Nederland B.V.
Total eligible cost: EUR 298,933.53
EC Contribution: EUR 147,312.29
Period: 01-Nov-1998 to 01-Nov-2000

3.5 LIFE has contributed to specific projects aimed at reducing greenhouse gases

A small number of LIFE projects (16) specifically aim to reduce the emission of greenhouse gases. This seems contradictory with the importance of the climate change issue, but this is part of the strategy of LIFE to avoid duplicating other EC programmes in this field.

It should also be considered that many of the projects overlap with other thematic areas because the emissions of greenhouse gases take place in most human activities. A typical example of this is the reduction of greenhouse gases in cities: currently most of the CO₂ emissions in cities are related to transport. Therefore, efforts to reduce these emissions are also related to urban and transport policies. Another example is related to methane emissions: the main sources are agricultural practices and waste management, including wastewater management.

Production of energy from renewable energy sources is related to several sources and technologies, ranging from biomass, waste and photovoltaics. Energy efficiency and saving is another aspect related to greenhouse gas emission reduction. These projects are often dealing with the improvement of industrial processes and production technologies.

There are a number of other EC programmes on this issue.⁸

⁸ Examples of such EC programmes are SAVE (energy efficiency), ALTENER (renewable energy) and STEER (energy aspects of transport) under the "Intelligent Energy - Europe" (EIE), which is the Community's support programme (2003-2006) for non-technological actions in the field of energy, precisely in the field of energy efficiency and renewable energy sources. Also highly relevant is the 'Sustainable Energy Systems' branch of the Sixth EU Framework Programme for Research and Technological Development (FP6) focusing on energy research.

LIFE example: projects complementary to other EU energy-funding initiatives "GIS-based planning tool for greenhouse gases emission reduction through biomass exploitation"

This Italian LIFE project targeted the reduction of greenhouse gas emissions, by designing, implementing and validating a GIS-based (Geographic Information Systems) planning tool for biomass exploitation in thermal power plants. The main aim was to use the tool to optimise land-use development and planning for the effective exploitation of biomass resources.

The project promoted the efficient management of forestry and agricultural land, and the integration of agriculture with industrial activities, thus contributing to sustainable and socio-economic development. In addition, it evaluated biomass productivity, as well as the optimal locations for biomass plants in Tuscany. The GIS tool was also used to calculate the expected CO₂ emission reduction from bio-energy. Integrated with a Regional Energy Plan, it is used to support local authorities' (regional department, energy agencies) involved in environmental management and energy planning, to define and implement a strategy in support of clean and green energy production.

Using biomass resources as part of Tuscany's Regional Energy Plan.

Through dissemination at a regional level, the beneficiary was also able to promote the efficient management of forestry and agricultural land, and the integration of agriculture with industrial activities – helping to contribute to sustainable and socio-economic development.

Project partner, ETA Renewable Energies, a privately-owned company in Florence, organised the 2nd World Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection held on 10-14 May 2004, in Rome, Italy. The LIFE project results were disseminated at this important international gathering. More recently, following the localisation of biomass resources in Tuscany, the beneficiary reports two more power plants are to be built in the Mugello area. The size of the plants < 0.5 MW has been set according to local energy demand. See the project website at: <http://www.etaflorence.it/biosit/>

Project Number:

LIFE00 ENV/IT/000054

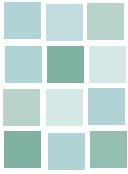
Beneficiary: Department of Energetics, University of Florence

Total eligible cost: EUR 442,488.00

EC Contribution: EUR 215,390.00

Period: 01-Oct-2001 to 01-Oct-2003





3.6 LIFE has advanced the development and application of innovative methods for the monitoring and decontamination of polluted sites

Soil is a vital and largely non-renewable resource increasingly under pressure. The importance of soil protection is recognised both internationally and within the EU. In order to perform its many functions, it is necessary to maintain soil condition. However, there is evidence that soil may be increasingly threatened and degraded by a range of human activities. The final phase of the degradation process is desertification when soil loses its capacity to carry out its functions. Among the threats to soil are erosion, a decline in organic matter, local and diffuse contamination, sealing, compaction, a decline in biodiversity and salinisation.

An explicit Community policy focusing on soil protection does not exist to date. Individual Member States have taken different initiatives on soil protection aimed at those soil degradation processes they considered as priorities. Monitoring systems are in place in some Member States; most Member States also have protective measures in place and are undertaking remediation actions. The Commission is preparing a strategy to protect soils.

Soil degradation in Europe

"In many areas of Europe, soil is being irreversibly lost and degraded as a result of increasing and often conflicting demands from nearly all economic sectors. Pressures result from the concentration of population and activities in localised areas, economic activities and changes in climate and land use. The combined action of these activities affects quality and limits many soil functions including the capacity to remove contaminants from the environment by filtration and adsorption. This capacity and the resilience of soil mean that damage is not perceived until it is far advanced. This partly explains the low priority given to soil protection in Europe until recently. Moreover, since soil is a limited and non-renewable resource, when it is damaged, unlike air and water, it is not easily recoverable."

"Soil contamination from local sources, mainly waste disposal from municipal and industrial sources and industrial activities, is widespread in western Europe as well as in central and eastern Europe, the Caucasus and central Asia. The first step in the management of contaminated sites (preliminary survey/investigation) is well advanced in most of the surveyed countries, but subsequent phases are progressing slowly. Although the 'polluter pays' principle is generally applied, a huge sum of public money has to be provided to fund necessary remediation activities, which is a common factor across Europe. Even though a considerable amount of money has already been spent on remediation activities, the share of the total estimated remediation costs is relatively low (up to 8%)."

[Source: *Europe's environment: the third assessment*, EEA, 2003]

Storage of soil with chemical contaminants.

Towards a thematic strategy for soil protection

In 2002, as a first step in the development towards encompassing EU policy in the protection of soils against erosion and pollution, the Commission published a Communication "Towards a Thematic Strategy for Soil Protection". This was the first time that the Commission had addressed soil protection for its own sake and as such, the Communication is both broad and descriptive in its approach as well as charting the way forward. As the next step, the Commission is preparing a strategy to protect soils that will provide uniform information and monitoring of soil, as well as recommendations for future measures and actions.

Further reading: (COM(2002)179 final), DG Environment home page at: http://europa.eu.int/comm/environment/index_en.htm



The LIFE programme has co-funded projects related to soil pollution and remediation from the very beginning. Between 1992 and 2004, the LIFE programme co-funded 97 projects related to site monitoring, risk assessment, rehabilitation and site decontamination. Through the projects, LIFE advanced the development and application of innovative methods in this field. It extended the knowledge basis on appropriate and economically sound methods for monitoring and decontamination of polluted sites.

Here, a particularly noteworthy example, provided by the Italian "PHYLES" LIFE project - coordinated by beneficiary, Istituto di Biofisica, CNR (a branch of the Italian National Council for Research) - concerned the demonstration of innovative 'phytoremediation' techniques to decontaminate lead-polluted soil.

Testing the efficiency of the 'phytoremediation' technique out in the field.



LIFE example: soil pollution and remediation

"Pilot phytoremediation system for the clean-up of lead-polluted soils - PHYLES"

A number of sites across Europe are heavily affected by metal contamination and in particular by lead contamination. This kind of pollution has been widespread in Italy and throughout Europe since ancient times. But the problem has become considerably worse in recent times with the growth in metal production and metal-based technologies such as power generation, domestic heating, etc. Many of the currently used technologies for soil remediation imply high remediation costs and excavation of the contaminated soil. These methods are often not cost-effective in terms of the returns that can be realistically generated from post-remediated sites.

The project aimed to test the efficiency of a pilot 'phytoremediation' technique for the decontamination of soils polluted by lead (Pb) by using hyperaccumulators and/or agronomic plants. Phytoremediation is an emerging and environmental sound strategy that represents a potentially cost-effective methodology for the remediation of soils contaminated by heavy-metals and other contaminants. More specifically, the project aimed to test the efficacy of decontamination of soils polluted by medium-to-large concentrations of lead (about 1000 mg/Kg dry matter) by using plants that were able to absorb the metal, producing a large amount of biomass. Chelating agents (such as EDTA) were added to the soil in controlled conditions in order to increase the bio-availability of Pb and, as a consequence, its absorption by plants.

The pilot study was carried out on a privately-owned farm site (at La Spezia, Arcola) that had been exposed to more than ten years of metal contamination by a nearby factory, which had since closed. Previous studies had indicated that dust (dry atmospheric deposition) was the main vehicle by which lead and other metals were dispersed from the factory.

The initial results of the project, demonstrated that compared with conventional remediation systems, the length of time needed for a complete phytoremediation

of the soil using the new chelate-assisted phytoremediation techniques could be reduced from an estimated 50 years to around 20 years. In addition the pilot study provided a satisfactory evaluation of the cost of phytoremediation applied on a field scale: The costs involved in the implementation of the pilot system amounted to approximately EUR 10,000 euros/100 m². This figure excluded staff costs, since it was assumed that in actual field applications the remediation measures would be carried out either by the landowner, or by the local environment authority. It was felt that these costs could be further reduced in large-scale applications.

A follow up ex-post evaluation study, carried out by the LIFE monitoring team in May 2004, showed that these results have lasted well beyond the project's end. The beneficiary and members of the PHYLES team have participated in a series of conferences after the end of the project, and continue to distribute the manual published during the project. The partners remain active in promoting cooperation and transfer of the LIFE results and are working closely with companies in order to advise on the application of phytoremediation on lead contaminated sites. A joint proposal is in progress with a company established near Rome (Ardea) to design a new methodology for the decontamination of soil in rifle ranges. Finally, in 2004, an international project, based on the pilot work, entitled "Microorganism-supported phytoextraction: an innovative procedure for the decontamination of soils polluted by heavy metals" was selected and approved by the Italian Ministry for Foreign Affairs and the Israeli Ministry of Industry, within a bilateral cooperation programme between Israel and Italy. See the project website at: <http://www.phyles.ge.cnr.it/>

Project Number:

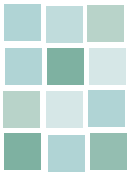
LIFE99 ENV/IT/000078

Beneficiary: Istituto di Biofisica-CNR

Total eligible cost: EUR 1,036,239.78

EC Contribution: EUR 512,955.32

Period: 01-Nov-1999 to 01-May-03



To conclude therefore, the previous sections have hopefully provided a clear indication of the way LIFE-Environment projects helped steer innovation and development in this area between 1992 and 2004. "What field are we in?" examines EU policy in this area, highlighting the most important legislation and initiatives, including the IPPC Directive and EMAS. This information is supported by key facts and figures from recent EEA publications. The question "How was the LIFE funding allocated?" is answered by tables and figures outlining the distribution of funding and number of projects for the seven generic sub-themes identified from the LIFE database of projects. The question "What were the main impacts of the LIFE programme?" is answered by six key messages – supported by a wide range of successful projects from different Member States – demonstrating environmental innovation and confirming the indirect contributions of the LIFE programme to European policy-making in this field.

4. Looking ahead: LIFE-Environment in 2005 and onwards ...

The focus of the LIFE programme in this sector in the near future, as laid down in the LIFE-Environment application guide 2005, is on financing projects related to clean technologies and to the reduction of greenhouse gas emissions. This will be done through demonstration projects and through so-called preparatory projects.

The priorities for innovative demonstration projects are as follows:

1. Clean technologies

- > Activities covered by the IPPC Directive, involving more specifically:
 - Implementation of more advanced techniques (in connection with environmental protection) than those described as Best Available Techniques in BAT reference documents. The degree of innovation, by comparison with techniques referred to in BAT reference documents, should be clearly described;

- Sectors where reference documents have not yet been produced, aiming to address the issues, in relation to BAT, listed in Annex IV of the Directive.

- > Support for activities addressing obstacles to the development of clean technologies not covered by IPPC, particularly those undertaken by SMEs.

2. Reduction of emissions of gases having a greenhouse effect

- > Development of innovative techniques or methods that substantially and quantifiably reduce greenhouse gas emissions (in all sectors, notably in industry, energy, transport, agriculture, forestry and waste management);

- > Innovative applications using renewable energy sources, for local or small-scale (<10MW) distributed generation of heat and power, complementary to other Community energy funding programmes.

The priorities for preparatory projects⁹ for 2005 are as follows:

1. Climate change – update of emission trading Directive

Objective: primary objective is the update of Directive 2003/87/EC "Greenhouse gas emission trading" in view of the possible inclusion of sectors not covered at present. A secondary objective will be to evaluate the effects of the existing greenhouse gas emission trading scheme with a view to updating this policy. Expected result: projects should deliver all necessary background elements to enable preparation of such an update, as well as the necessary data to allow measuring of its impact in environmental, social and economic terms.

2. Climate change – gaps in existing policies of energy efficiency

Objective: analyse and identify any gaps in the existing policies in the sector of energy efficiency in buildings and appliances in view of possible new policies and/or update of

EU policy in this sector. This analysis should take into account the technical progress in this sector. Expected results: complete gap analysis of existing policies with particular emphasis on enlargement countries. Final expected output is a concrete and detailed proposal for policy making and/or update of EU policy in this sector. This should include the necessary data to allow measuring its impact in environmental, social and economic terms.

3. Clean technologies

Objective: extend the IPPC Directive 96/61/EC to intensive fish farming. Expected results: project should deliver all necessary background elements to allow preparing such an update as well as the necessary data to allow measuring its impact in environmental, social and economic terms.

In the longer term, the Commission is preparing the Framework Programme for Competitiveness and Innovation (CIP) that would integrate environmental technologies starting from 2007. The CIP aims to encourage innovation and the sustainable use of resources, including environmental technologies, for the period 2007-2013. CIP would also promote networks to support SMEs and facilitate the access of SMEs to finance.

⁹ Preparatory projects are preparatory to the development of new Community environmental actions and instruments, and/or the updating of environmental legislation and policies. Preparatory projects should therefore respond to specific needs in the sector of policy making. They are different from demonstration projects as they do not target the implementation of existing policy. They also differ from demonstration projects as they do not need to comply with criteria such as being innovative, demonstrative and replicable.

4.4: LIFE and Waste



1. What field are we in?

The waste sector is one of the most mature environmental sectors. Technologies and methods have been developed over the past 25 years and our knowledge of the issues related to waste and of ways of tackling them is well advanced. Public awareness of these issues is also more sophisticated with many initiatives aimed at promoting waste reduction, recycling or more efficient disposal.

In this sector, 12 years of the LIFE-Environment programme have certainly played a key role in providing answers to individual technological problems, particularly in the treatment of waste in different manufacturing industries. Collective methods for better management of waste have also been identified, while awareness-raising campaigns have been conducted in many areas of Europe.

Yet, the LIFE programme has gone further - providing an opportunity for many companies to demonstrate that a better way of using resources and of treating waste can also provide better value-for-money. It has also allowed public authorities to improve their working methods by utilising innovative methods of managing waste.

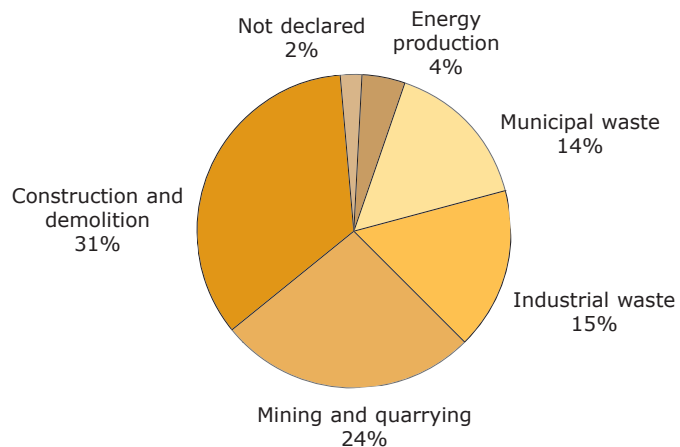
In line with the Sixth Environment Action Programme (6th EAP), the strategy of the EU to cope with waste is to prevent waste in the first place; to re-use, recover and recycle waste of all kinds; and to ensure the sound management of waste streams.

Public awareness of waste issues has become more sophisticated with widespread acceptance of waste containers.

Figure 13. Waste generation by sector in Western Europe countries¹. [Source European Environment Agency (EEA).]

¹ This breakdown does not include the agricultural sector, a main producer of biodegradable waste.

Total waste generation by sector in WE





Different types of waste

Despite the intensive efforts of some countries to reduce the amounts of waste, and the numerous regulations adopted over the last 25 years that have been transposed progressively in Member States [e.g. the Packaging Waste Directive (1994/62/EC), Waste Incineration Directive (2000/76/EC), End-of-Life Vehicles Directive (2000/53/EC) and Waste Electrical and Electronic Equipment (2000/96/EC)], the amount of waste produced in the EU continues to rise in most countries. According to the latest assessment by the European Environment Agency ("Europe's environment: the third assessment" 2003) an estimated more than three billion tonnes of waste is generated in Europe every year, amounting to an average 3.8 tonnes per capita.

The main sources, or generators of waste, are manufacturing, construction and demolition, mining and quarrying, and agriculture. Other important waste streams are municipal waste, hazardous waste, waste from end-of-life vehicles and waste from energy generation.

Construction and demolition waste

Construction and demolition waste is the largest single category of waste in Europe, accounting for approximately 31% of all waste generated in Western Europe (WE). It can include dangerous substances, such as asbestos, which may be present in significant quantities when old buildings are demolished or renovated. However, many components in this waste category are easily recyclable and have the potential to replace up to 10% of raw materials. Some EU countries such as Germany, Denmark and the Netherlands, have achieved a recycling rate of up to 90% in this sector.

Mining and quarrying

The second largest waste group is mining and quarrying, accounting for more than 24% of all waste generated. The disposal of mining waste can take up large areas of land and, unless properly managed, can result in detrimental impacts on air water and soil quality, especially in case of accidents. In this sector, the EU has proposed initiatives, including a directive, designed to improve mining-waste management.

Industrial waste

Industrial waste accounts for 15% of the total waste stream. In this sector the range of waste is as broad as the manufacturing industries that produce it and some dominant industries can have a strong influence on the composition of waste when treated or land filled. In general, industrial waste consists of organic materials, wood, paper, chemicals, non-metallic minerals, basic metals and other wastes.

Municipal waste

The fourth largest sector is municipal waste, accounting for approximately 14% of total waste produced in Europe. In 1999, 57% of the municipal solid waste was deposited in landfills, but the rates for composting and recycling were on the increase.

Energy production waste

The energy production sector accounts for 4% of waste in Europe. This varies considerably, depending on the type of fuel used. While hydroelectric and gas-fired power stations generate almost no solid waste, large quantities of bottom ash and fly ash are generated by coal-fired power stations. A shift to cleaner (e.g. natural gas) and renewable sources of energy will result in reduced waste quantities. Similarly, all technological development allowing a reduction in electricity use is contributing to lowering the production of waste.

Hazardous waste

A limited number of economic sectors contribute substantially to the generation of hazardous waste. Although this only makes up some 1% of all waste generated in Europe, due to the dangerous substances it contains, it presents a serious risk to the environment and human health, if not managed and treated safely.

[Source: "Europe's environment: the third assessment - European Environment Agency (EEA)]

French LIFE beneficiary Valoref treats specific waste from the demolition and rebuilding of kilns. (LIFE97 ENV/F/000191)



2. How was the LIFE funding allocated?

Some statistical information on LIFE and waste

As the table illustrates, 266 projects out of 1,404 (19%) LIFE-Environment I, II and III projects were undertaken specifically on issues related to one field of waste or another in 1992-2004. The total investment planned by those projects (many are still ongoing) is EUR 551.39 million for a Community contribution of EUR 133.73 million. The 'leverage' capacity of this type of project means one euro invested by the EU will be matched by over three euros from other private and public funds.

Within this overall sector, the greatest number of projects concerns manufacturing waste – 57 industrial waste projects, together with a significant proportion of the (53) hazardous waste projects, reflecting the diversity of problems created by many industrial processes. Projects in this field typically range from the management of industrial or other special waste, treatment and recycling of metallurgical industry waste and the management of liquid residuals.

The second largest cluster of projects is for those covering municipal waste, accounting for a total of 50 projects: 19% of the total, between 1992 and 2004. This sector includes: biodegradable municipal waste – responsible, according to the EEA, for approximately 60% of the municipal waste stream in Western Europe; recycling of plastics and wrapping; and also projects in the management of household waste e.g. projects related to landfills/leachate and projects related to the treatment of sludge.

The third cluster of projects addresses schemes to recycle plastics and packaging, according to the EEA, the creation of market opportunities and increased public acceptance is expected to dramatically increase the opportunities for recycling of plastics and packaging. This trend is reflected in increased LIFE activity in this field: 30 projects over the period 1992-2004.

Biodegradable municipal waste, accounting for 60% of the total municipal waste stream, is also an important field of activity for LIFE. It is generated by households and commercial activities and includes waste

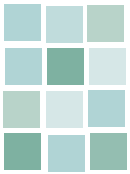
from food, paper, cardboard and garden waste. It is a major contributor to the generation of leachate, landfill gas, odour and other problems in landfills. Alternative treatment methods such as composting or anaerobic digestion can eliminate or significantly reduce the polluting and emission potential of biodegradable waste. The EU landfill directive imposes strict targets for the reduction of biodegradable municipal waste that may be disposed of to landfill, namely a reduction to 35% by 2016. Source separation, separate collection, more incineration, more composting and bans on landfilling are among the key instruments needed to reach this target.

It is noticeable that some fields, such as the management of household waste, have decreased in importance over the years, probably because solutions have been identified for the main problems.

As certain sectors decline in importance, however, new fields emerge, such as the recycling of WEEE (Waste Electronic and Electrical Equipment), which accounted for a small cluster of LIFE projects (18) between 1992 and 2004.

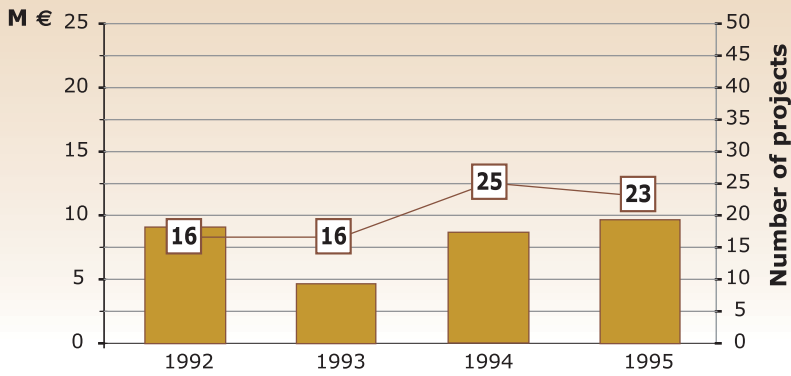
Table 4: Waste projects financed by LIFE-Environment 1992-2004

Waste projects by sector (1992-2004)	Number of Projects financed	Total cost of projects (EUR Million)	Total EC Contribution (EUR Million)	Percentage EC contribution	Average cost per project (EUR Million)
Industrial waste (including manufacturing)	57	140.92	25.92	18%	2.47
Hazardous waste	53	129.70	29.57	23%	2.45
Municipal waste (including household and commercial)	50	85.67	26.24	31%	1.71
Packaging and plastic waste	30	76.96	17.69	23%	2.56
Agricultural waste	24	30.52	8.83	29%	1.27
Waste from Electrical and Electronic Equipment (WEEE)	18	28.50	9.10	32%	1.58
End-of-Life Vehicles (ELV's) and tyres	14	28.64	6.69	23%	2.04
Construction and demolition waste	12	14.12	4.92	35%	1.18
General: Waste management	8	16.36	4.77	29%	2.04
TOTAL/MEAN	266	551.39	133.73	24%	2.07

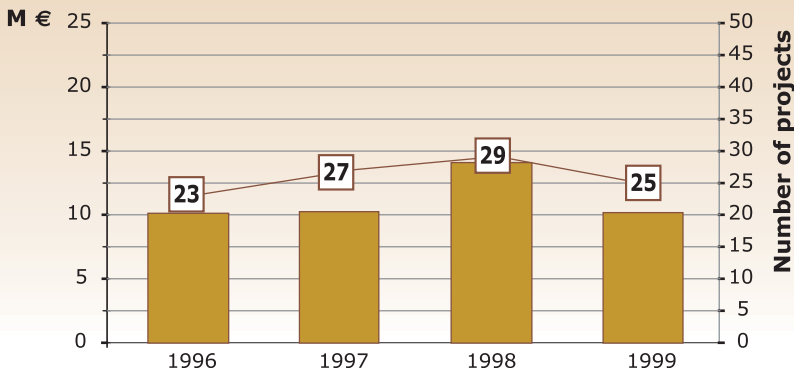


Waste Management

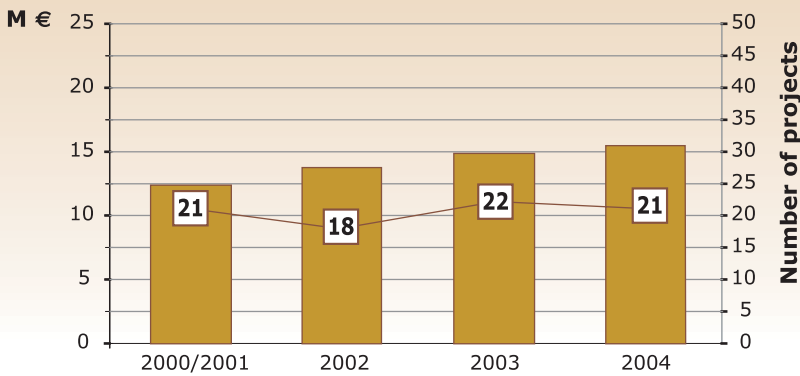
LIFE I



LIFE II

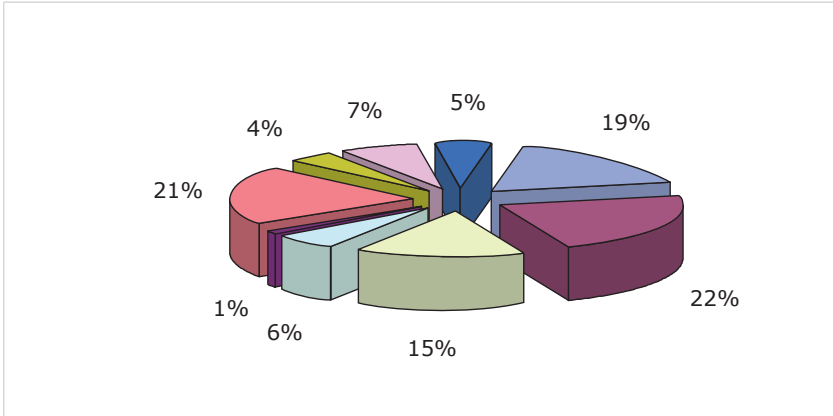


LIFE III

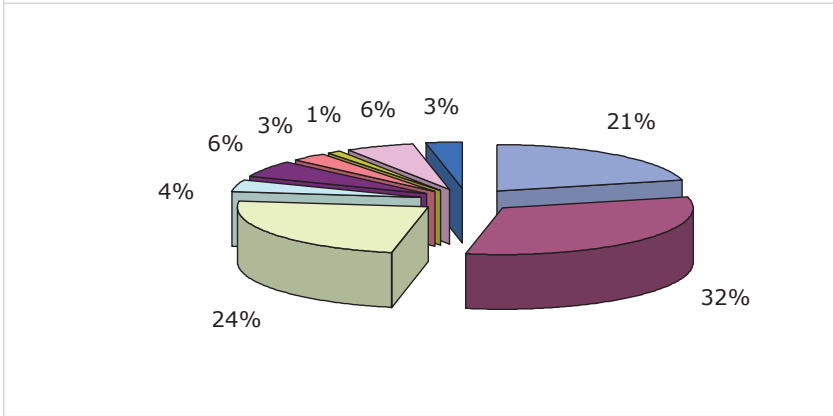


X Number of projects
 EU contribution in Million EUR

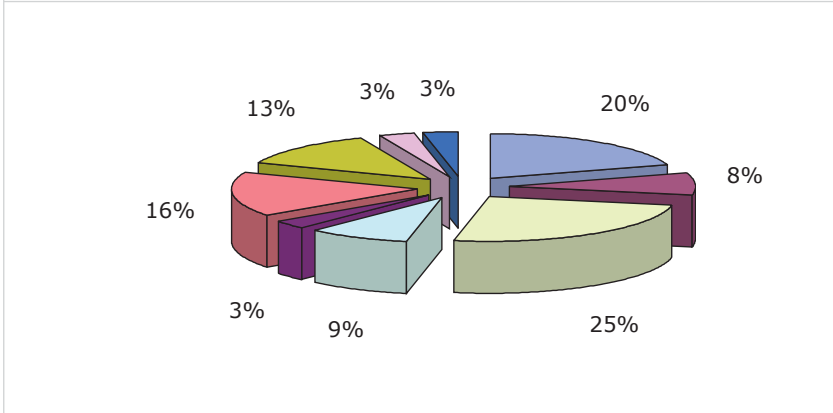
Figure 14-a. Waste management projects in EUR million for LIFE I to LIFE III to 2004, with line superimposed to illustrate the total number of projects in this field for that year.



**LIFE I -
EU total funding in %**



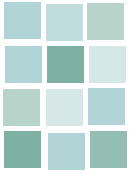
**LIFE II -
EU total funding in %**



**LIFE III -
EU total funding in %**

- Municipal waste (including household and commercial)
- Industrial waste (including manufacturing)
- Hazardous waste
- Agricultural waste
- Construction and demolition waste
- Packaging and plastic waste
- Waste from Electrical and Electronic Equipment (WEEE)
- End-of-Life Vehicles (ELV's) and tyres
- General: Waste management

Figure 14-b. Waste management – percentage of EC co-funding by sub-sector in LIFE I to LIFE III to 2004.



3. What were the main impacts of the LIFE programme in the waste sector?

3.1 The LIFE programme provided innovative solutions to the treatment and recycling of industrial and other special waste problems

According to the EEA, approximately 740 million tonnes of waste is generated by manufacturing industries in Europe every year. Small and medium-sized enterprises, as well as some large enterprises, do not always have the expertise or the resources, to ensure that the management of their waste does not have detrimental environmental impacts. Figures from the LIFE database show a total of 57 LIFE co-funded projects were dedicated to the treatment and recycling of industrial waste between 1992 and 2004, and a further 53 concerned hazardous waste projects, a large proportion of which were from the manufacturing industries.

Photo depicting the first phase of the Terpene process, whereby organic residues are obtained from citrus fruit pulp for the finished products: terpene and essential oils.

LIFE example: recycling waste from manufacturing (1) "Terpen recovery from residues from oranges"

In Italy, this successful project looked at residues from the production of orange juice. A ton of oranges produces approximately 600 Kg of waste. The project developed innovative technologies to process this waste and extract different by-products.

These included:

- > deterpenated essential oils, used in the food industry;
- > TERPENE (d-limonene), a natural solvent that can be substituted for highly polluting chlorinated organic solvents such as trichloroethane, trichloroethylene and perchloroethylene for industrial applications;
- > pectin, used in the food industry;
- > pigments for colouring;
- > fillers for paper, replacing more traditional mineral fillers;
- > combustible material with a high calorific value;
- > flour for animal feedstuffs (wholesome and providing excellent nutritional value); and
- > thermal-insulation granules with similar features to cork.

A follow-up interview, carried out by the LIFE monitoring team in January 2005, revealed that as a result of the success of the LIFE project, a new pilot project has been co-financed by MIUR (Italian Ministry for Research and University). Entitled "Swift extraction of high quality vegetal by-products via combined thermal/mechanical/chemical treatment", this 36-month project aims to upgrade the TERPENE methodology in order to meet the increasing number of requests for vegetal extracts (essential oils and terpen). See project website at: <http://www.contentotrade.it/>.

Project Number:

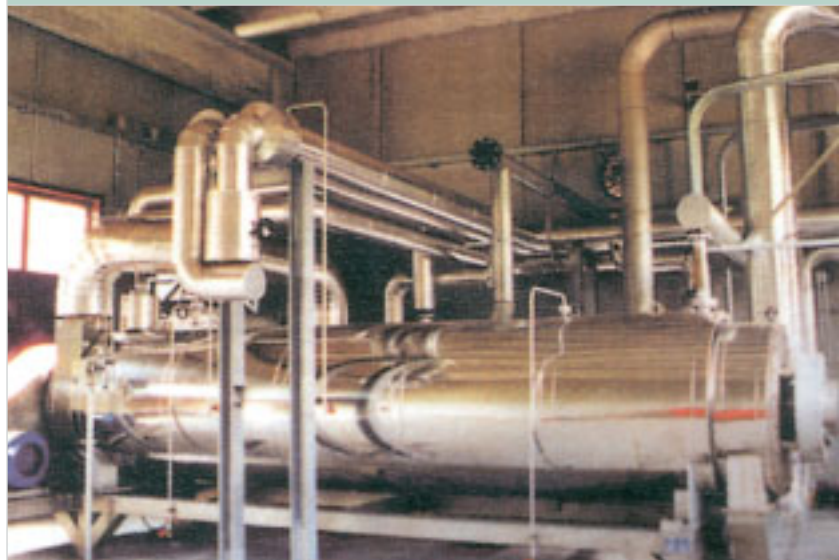
LIFE96 ENV/IT/000142

Beneficiary: Contento Trade S.r.l.

Total eligible cost: EUR 826,262.76

EC Contribution: EUR 247,878.83

Period: 01-Jan-1997 to 30-Apr-1999



LIFE example: recycling waste from manufacturing (2)
“Set up of a complete and specialised process line of scrap refractories management and recycling”

This French LIFE project was carried out by the privately-owned company Valoref. The company specialises in the treatment of a specific type of waste from the demolition and rebuilding of kilns.

Glassmakers generally have to demolish and rebuild their kilns every five to eight years. This activity alone produces more than a quarter of the 250,000 tonnes of refractory waste created every year in Europe. The waste itself does not pose a major threat to the environment. The problem arises when it is contaminated with certain heavy metals such as lead, which is used in the manufacture of special glass, or by deposits left behind by the fuels used.

The Valoref project aimed to double its waste recycling rate by developing a specialised procedure, incorporating the rationalisation of sorting methods and also allowing improved identification of the sorted residues.

The equipment produced at a new site at Bollène river port permitted optimised management of the waste. By project end, 65% of the waste treated was recovered in the form of secondary raw materials and 20-30% as granulate. Only 10-15% was sent to a final storage centre. Certain waste (siliceous refractories, chromium, electro-cast refractories of the AZS type, etc.) was completely recycled.

Taking into consideration the development of European and national legislation, this treatment cost, linked with efforts to recover recycled material, resulted in a reasonable level of profitability for products that, on the face of it, had low intrinsic value. The closeness of the industrial site, and the existence of the river link, favoured the transport of the waste by barge, which is less polluting (60% of the waste is being brought by this means).

The methods and techniques employed have already allowed Valoref to apply this methodology to other industrial sectors using kilns, such as steelmaking and metallurgy, and in other geographical areas.

A follow-up study carried out by the LIFE monitoring team in August 2004, showed the following results: By the end of 1999, the beneficiary was treating 18,000 tonnes of waste, which was slightly below the initial target. However, by the end of 2003, 20,500 tonnes were being successfully treated. This means the initial target was successfully achieved within three years of the close of the project. The beneficiary also reported a recovery rate of 65%, depending on the type of waste. Finally, the development of the LIFE co-funded technology created an additional 10 jobs in the company.

Project Number:

LIFE97 ENV/F/000191

Beneficiary: Valoref S.A.

Total eligible cost: EUR 1,668,101.84

EC Contribution: EUR 226,964.26

Period: 01-May-1997 to 01-May-2000

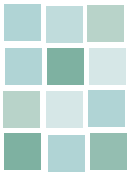


Waste residues are sorted on this conveyor belt – helping to identify the material that can be recycled

In a second example, a French LIFE project was responsible for the development of a specialised process line for dealing with a specific type of waste, from the demolition and rebuilding of glassmaking kilns – the only recycling scheme of its kind in Europe.

Valoref's Bollène industrial site in France: waste is first broken up to a suitable size for the sorting process.





In a third example, a LIFE project in Finland tackled the growing problem of what to do with plastic waste from the health sector (note, no separate data concerning number of projects, as the 'special waste' sector is not classified separately). Plastic waste generated in hospitals accounts for approximately 5.4-8 kg waste per bed daily throughout Europe². Unfortunately, while much of this material can be recycled, misperceptions and prejudices associated with plastic used in hospitals mean that these valuable resources are most often dumped at the nearest landfill, compounding the already high volumes of waste in our environment.

² Source: LIFE Focus, publication "A Cleaner, greener Europe: LIFE and the European Union waste policy. Luxembourg Office for Official Publications of the European Communities 2004 - 28p. - 21 x 28 cm ISBN 92-894-6018-0

Model for the sorting and recycling of plastic waste at Tampere University Hospital.

LIFE example: recycling special plastics "Reclamation of Plastic Waste generated in Hospitals"

Staff at Finland's Tampere University Hospital identified a lack of recycling models to provide guidance in the sorting and recycling of plastic waste in the health services sector. Working with specialists in the field of plastics and logistics they drew up guidelines specific to hospital waste. The idea was that the plastic would feed back into the materials' production chain, thus reducing the amount of waste produced and the burden on municipal landfills and on the environment.

As a first step, the quality and quantity of plastic waste produced within the Tampere University Hospital, and three other participating hospitals: Helsinki University Central Hospital; Kanta-Häme Central Hospital; and Kuopio University Hospital, was analysed and broken down by type of plastic and product. These guidelines centred on the features particular to hospital waste (such as its highly variable composition). After that the collection and processing was carried out with the help of the guidelines.

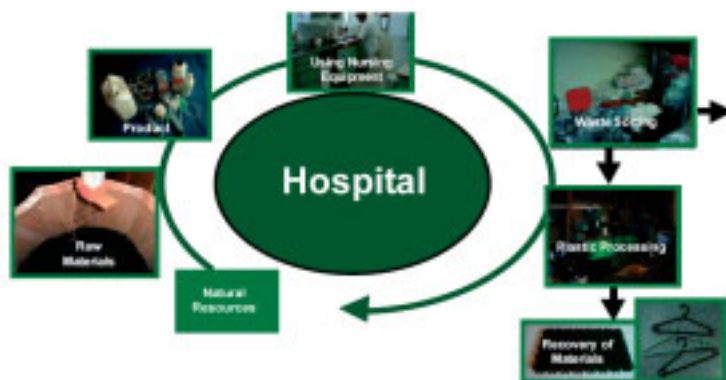
The project team successfully developed the country's first model for recycling plastics used in hospitals. One of the innovative features of the project involved identifying which products were suitable for recycling. Potential re-users were small- and medium-sized plastics companies.



Staff at Tampere University Hospital identified a lack of guidance in the sorting & recycling of their plastic waste.

On completion of the project in 2001, the results revealed that approximately 71% of all the hospital waste was suitable for recycling, despite the fact that the hospitals used hundreds of different plastic products made of widely varying chemical compounds. Another important finding was that the impurities leading to possible risks, infections etc., upon waste collection were actually quite small.

A follow-up report, carried out in December 2004 by the LIFE monitoring team, showed the process of separating the plastic waste has recently been extended to several other Finnish hospitals. A large proportion of the rejected waste is also re-used as product and almost all recyclable plastic material is delivered for re-processing. See: <http://www.tays.fi> (Finnish only)



Project Number:
LIFE98 ENV/FIN/000577
Beneficiary: Tampere University Hospital
Total eligible cost: EUR 333,915.46
EC Contribution: EUR 150,261.96
Period: 01-Sep-1998 to 01-Sep-2001

It is noticeable that a number of the 18 LIFE co-funded projects concerned with the recycling of WEEE (Waste Electronic and Electrical Equipment) are still ongoing, reflecting the rapidly increasing numbers of electronic appliances and the fast pace of technological development in the E-Waste sector. Already in 1998 this sector accounted for 4% of the municipal waste stream in Europe, and is forecast to increase by at least 3-5% per annum. (Explanatory Memorandum on WEEE, European Commission, June 2000, p 4). As more than 90% of WEEE is land-filled, incinerated or disposed of without treatment, this sector accounts for a large proportion of the various pollutants found in municipal waste. The following successful LIFE project in Greece set out to promote sustainable management of used electronic equipment. It was the first project of its kind in the country.

Discarded components, including microprocessor boards, are stripped, and after salvaging all re-usable materials, recycled.



LIFE example: recycling WEEE “Sustainable Management of E-waste in Greece”

This project was carried out by NGO, the Ecological Recycling Society of Greece. At the start of the project, in 2001, almost 100% of WEEE ended up in the regular waste stream and was in some cases illegally incinerated or disposed of in unauthorised landfills. This in turn caused a number of other problems due to the different toxic materials seeping into the ground through landfills, or released into the atmosphere by incineration.

The pilot study established a separate collection system for computer equipment and peripherals from homes, companies and offices in the area of Attica (covering the capital and surrounding district). Re-usable computers and components were repaired, with the data removed from the hard drives. These were sold to interested parties. The discarded components and materials were stripped and, after salvaging all re-usable materials, recycled.

The initiative also included the creation of a database for the gathering and analysis of information from the project. This included details of the type of WEEE collected, whether each component was sent for re-use, recycling or disposal, the type of repair/treatment required and the average life-span of the equipment.

As a result of these actions, more than 73 tons of WEEE was diverted from the municipal waste stream. This was managed in an environmentally sound way to reach 2.3-2.8% of the proportional target for the treatment of computer equipment set for Greece by 2006. The project was the first of its kind in Greece, as sustainable WEEE-management had not been applied before.

At the time of the implementation of the project, relevant EU and Greek legislation was being introduced in the area (Greek legislation for Alternative Management for Waste Packaging and other products and the European WEEE Directive (2000/95/EC). An E-waste forum was formed in the context of the project, in order to bring together the interested parties and to help formulate policy and strategy.

Results at project closure showed the project had contributed to the development of policies and actions for the harmonisation of the European Directive into national legislation, as well as the implementation of regulation agreements, financial tools and training required at the national and local levels.

A follow up interview, carried out recently by the LIFE monitoring team, reported that the E-waste forum continues to function informally. The beneficiary continues to ensure interested parties are updated on the new legislation and the responsibilities and rights of the concerned parties. The beneficiary will reassess the role of the forum when the proposed recycling system for electric and electronic waste becomes fully functional in Greece. See:

<http://www.ecorec.gr/>

Project Number:

LIFE00 ENV/GR/000688

Beneficiary: Oikologiki Etairia Anakyklisis (Ecological Recycling Society)

Total eligible cost: EUR 918,873.00

EC Contribution: EUR 446,400.00

Period: 01-Nov-2001 to 01-Nov-2003



3.2 The LIFE programme helped provide innovative solutions to individual technological problems, particularly in manufacturing

The LIFE programme has played a key role in providing innovative solutions to individual technological problems within the waste recovery, re-use or recycling sectors. Significantly, LIFE co-funding can help cover the potential risk of more innovative ventures – encouraging companies to develop their R&D activities in areas where the immediate financial gain may not be apparent, but where the longer-term economic and social benefits may make such projects worthwhile.

To prepare the thematic strategy on waste within the framework of the 6th EAP, the Commission issued a Communication "Towards a thematic strategy on the prevention and recycling of waste" (Brussels, 27.5.2003, COM (2003) 301 final). In the document the Commission emphasised the need for R&D and technology demonstration to improve waste management. The LIFE programme has always supported this approach.

Within the LIFE programme there are many examples of innovative projects providing individual solutions to technological waste problems. An excellent example is provided by a Danish project, which tackled the little-known issue of how to dispose of millions of tonnes of decommissioned ammunition, currently being stockpiled in Europe.

Experimental set-up for a UN test.

LIFE example: solutions to technological waste problems "Study and Development of Technologies for Safe and Environmentally Optimal Recovery and Disposal of Explosive Wastes"

Ammunition and explosive waste has traditionally been disposed of by open burning and open detonation, which is unacceptable from an environmental point-of-view. The goal of the project, managed by Denmark's DEMEX Consulting Engineers (now part of NIRAS Consulting Engineers and Planners A/S), a company specialising in ballistics' protection, demilitarisation, blasting and explosion techniques, was to seek emerging and available demilitarisation technologies. The R&D work was carried out in six phases comprising 12 tasks. The project studied the sources, management, recovery and disposal of explosive waste in Europe. It also surveyed and analysed the best available technologies for recovery and disposal.

The test phase involved researching and developing selected methods for handling and disposing of explosive waste safely. First to be tested was the explosive behaviour of a slurry consisting of trinitrotoluene and water. Disposal tests also included mobile demilitarisation technologies and closed detonation in chambers.



With closed detonation it was possible to treat whole devices or ammunition parts. In addition, incineration trials were conducted in a fluidised bed oven, in the laboratory and finally at full-scale. In the last phase, the results were gathered, and recommendations made for the management and recovery of explosive waste.

The project closed in 2000. However, its results continue to be utilised extensively e.g. in landmine surveys, and the project beneficiary has disseminated its experience to several regional and global organisations.

The company has also cooperated with Norway's Scanteam on the evaluation of a Global Landmine Impact Survey. The evaluation covered visits to Bosnia, Mozambique, Chad, Ethiopia, Cambodia, Thailand and Yemen and was presented to the client Survey Action Committee, UNMAS, UNOPS and others. Also, regarding the reconstruction and rehabilitation efforts in Iraq, in March 2003 the company created the Danish Mine Action Consortium (DAMCON) in co-operation with the Danish companies: Bruhn Newtech, Danminar, Brock and Michelsen, Dyno Nobel Denmark, and Norad. In June 2004, DEMEX was acquired by NIRAS, a larger consultancy.

Project Number:
LIFE96 ENV/DK/000018
Beneficiary: DEMEX Consulting Engineers A/S
Total eligible cost: EUR 1,361,760.05
EC Contribution: EUR 678,041.36
Period: 15-Mar-1997 to 15-Mar-2000

3.3 The LIFE programme has played an important role in identifying improved collection methods for a better management of waste

It is often stated that the protection and improvement of the environment requires the participation of different types of stakeholders. This is particularly true in the case of waste management, where the combined approach (prevention, recycling and disposal) requires a global effort to be made by the industry, the public sector and the general public. Each of these levels is responsible for the situation on the waste front and there is a need to mobilise them all if we want to actually reduce the quantity of waste in Europe. The accumulated experience of the LIFE programme provides the decision-maker with a number of examples of how to solve some of the key issues of waste management in Europe.

Over the period 1992-2004, LIFE co-funded 39 projects (a number of which are still ongoing) that included improved management of waste-collection in their overall objectives. An illustration of the success of such schemes is provided by a LIFE project in Antwerp, Belgium.

Waste collection vehicles with side loaders.

Life example: better management of waste

"New methods of selective collection and transport of solid waste, supported by advanced modelling for comparative evaluation of system cost-effectiveness"

This Belgian LIFE project successfully implemented and evaluated a new cost-effective solution for selective domestic waste-collection and transport in Antwerp. Its aim was to achieve a 40% reduction in costs and to develop a totally integrated collection system that would comply with the new CEN and EC directives.

The system consisted of the collection of domestic waste in a local area, transshipments at change-over-points and the transfer to final depot by means of separate transport vehicles. Its main innovative features were the use of demountable containers (so that containers could be easily 'demounted' from the back of the trucks) and a high degree of automation, requiring only one person to operate the system. These elements helped support the overall sustainability of the system.

Although the initial investment in the new system was quite high, the working costs were less than for conventional collection systems. Cost savings of

around 40% were achieved. The main environmental benefits came as a result of improved logistics from the creation of changeover points for the demountable containers, resulting in important savings on fuel consumption and air pollution (28% according to the mathematical model). In addition, as the improved cost-effectiveness of the system is also likely to provide a strong incentive for introducing selective waste systems at municipal level, the project should help to reduce the negative impact from solid waste disposal.

In a recent follow-up interview carried out by the LIFE monitoring team, the beneficiary reported that the system is still operational and continues to provide "great satisfaction".

Project Number:

LIFE97 ENV/B/000413

Beneficiary: Municipality of Antwerp

Total eligible cost: EUR 3,183,682.31

EC Contribution: EUR 852,075.19

Period: 01-Apr-1997 to 01-Aug-2000





3.4 The LIFE programme contributed to awareness-raising campaigns on waste issues in many areas of Europe

Awareness-raising campaigns have been conducted in many areas of Europe. Between 1992 and 2004, 13 LIFE projects launched major awareness-raising campaigns across Europe, both to members of the public and among industry sectors or professions. These projects are often promoted by NGOs, or by industry associations who are keen to promote the reduction of waste generation at source.

Above (right) Zaragoza paper recycling logo. (Below) raising public awareness of the "Zaragoza saves paper" campaign.



LIFE example: raising public awareness (1) "Zaragoza saves paper ... and trees"

In Zaragoza, Spain this LIFE project set out to raise public awareness of the need to recycle paper. The project was promoted by the "Fundación Ecología y Desarrollo", an environmental NGO dedicated to sustainable development. It was formed by a group of professionals who wanted to develop alternative strategies that were ecologically sustainable, socially just and economically viable. They also had experience in a former awareness-raising project (LIFE96 ENV/E/000509) aimed at lowering water consumption.

The project focused on awareness-raising among different establishments, in particular in local schools, with 25,000 students participating in different activities and the collaboration of 216 social groups. Special material was designed for carrying out eco-audits in schools and in public buildings. As a result, 31 public centres applied preventive practices and collaborated with selective collection.

The interest aroused by the project in the educational community was reinforced by the creation of a permanent network of teacher collaborators. Within the commercial sector, agreements were reached with a significant number of shops over separation of paper and 1,500 cutters were delivered to aid this process. Agreements were also reached with the paper-recycling company on the collection of monthly breakdowns of collection rates, which helped in the monitoring process.

At project closure, the economic benefits provided by the project to the key agents were further incentives for their collaboration. The project also succeeded in reducing the use of paper (by 128 tons in the first year) and in reducing the paper and cardboard component of urban waste (by 24,000 tons). This meant a saving of 336,000 trees, 360,000 m³ of water and 9,600 t.o.e., (tons of oil equivalents).



A follow-up report, carried out in February 2005 by the LIFE monitoring team, showed the selective collection of paper and cardboard has continued in the city. The successful results, together with the experience and knowledge acquired during the LIFE project, have enabled the beneficiary to continue to develop its role as a point of reference for paper and cardboard waste management. The beneficiary is also involved in a number of other paper-saving and management activities, including:

- > Organisation of selective collection and awareness campaign (in the Huesca Region);
- > Studies on technical, economical and environmental viability of paper selective collection;
- > Audits on use and management of paper waste for public entities and private companies throughout Spain;
- > Other Spanish cities, including Burgos and Jaca, have expressed interest in the LIFE project, and the beneficiary is working with them to implement various paper waste management activities. Finally, the website developed during the project continues to be updated. See:

<http://www.reciclapapel.org/>

Project Number:

LIFE99 ENV/E/000371

Beneficiary: Fundación Ecología y Desarrollo

Total eligible cost: EUR 626,232.90

EC Contribution: EUR 311,350.98

Period: 01-Jul-1999 to 01-Jan-2002

LIFE example: raising public awareness (2) “Recycling used cooling liquids”

Produits Chimiques du Mont-Blanc (PCMB) founded in France in 1950, is an SME involved in cooling liquids, refining glycols and the production of industrial and domestic antifreeze. The cooling liquids are made up of 55% of water and 45% glycols. These products are dangerous and are marked with a “Saint André’s cross” on their packaging.

In France, less than 5,000 tons of waste from cooling liquids is collected annually and destroyed by burn-off evaporation. This process has high energy consumption and results in 80% polluted waste water. The high cost of treating this waste (EUR 152.45 per ton) is one of the main reasons that 30,000 tons of waste remains uncollected. This waste is generally discharged in an uncontrolled way into the sewage works, rivers and the soil.

The main objectives of the project were to inform and convince users not to discharge any more Used Cooling Liquid (UCL) into the environment, to set up collection points and to develop the industrial process of recycling.

In order to re-use 30% of the glycols recovered in UCL, PCMB developed a clean and energy saving process that allowed degraded products to be separated from the water and glycols. The water would be re-used in the plant heat-exchanger and the glycols were sold to the manufacturers of new cooling liquids. The remaining waste (3%) would be sent to a destruction centre.

An important environmental result and complementary activity of the project was the awareness of the environmental problem raised among stakeholders during the project. The beneficiary therefore carried out an awareness campaign among automobile-makers, industrialists, local authorities and institutions to inform them of the existence of the recycling channel made possible through the project. At the same time, the beneficiary approached waste transport firms to inform them of the nature of this type of

hazardous industrial waste and to encourage them to install pumping and storage equipment for this product.

After three years of development, in total 2,000 tons of UCL were collected and recycled at a treatment price of approximately EUR 100 per ton.

A recent follow-up survey, carried out by the LIFE monitoring team showed the objective is to collect 4,000 tons more in the next five years. The lowering of the treatment costs and the improvement of the quality of the recycled glycols will also provide a better balanced life-cycle for cooling liquids. In addition, according to the beneficiary, this newly developed flexible and efficient technique can be exported to other European countries

Project Number:

LIFE99 ENV/F/000510

Beneficiary: Produits Chimiques du Mont-Blanc (PCMB)

Total eligible cost: EUR 707,124.10

EC Contribution: EUR 142,254.60

Period: 01-Oct-1999 to 01-Sep-2002

Another LIFE project was successful on two levels: firstly, by providing new technology for recycling hazardous cooling liquids, and, secondly, by raising awareness of new recycling opportunities for previously uncollected hazardous waste.

Produits Chimiques du Mont-Blanc (PCMB) plant in the Rhône-Alpes region of France.





3.5 LIFE supports 'win-win' projects combining environmental benefit with social or economical benefit

A number of outstanding LIFE projects go one stage further than simply highlighting better ways of treating waste. They are able to demonstrate to companies or other bodies, that treating waste can actually provide better value-for-money. For example, a project in the Netherlands was responsible for the development of a new technology in the waste treatment process. This is a good example of a 'win-win' situation - where a major improvement for the environment also resulted in significant savings in a competitive industry.

A second LIFE example, "Use and ...re-use. The 'processing centre' in the logistics of packaging of fresh fruit and vegetable products" (LIFE99 ENV/IT/034) developed an innovative system for avoiding the waste from millions of tonnes of packaging generated annually in Italy, from the transportation of fruit and vegetables. It has achieved spectacular economic/environmental savings and, following completion, continues to grow from strength to strength. The scheme now looks set to be replicated in other European countries. (For further details of this 'win win' project see chapter 5, section 5.2)

'Paste' that was previously deposited in waste water can now be recovered using the TPT technology.

LIFE example: providing value-for-money (1) "Total paste return in textile printing"

This LIFE project in the Netherlands developed a new technology that allowed nearly total recovery of "paste" when printing on textiles. With a return on investment of about one year, it made good sense to adopt this new technology.

The implementation of a 'Total Paste Return' (TPR) system in a textile printing industry allowed the recovery of up to 95% of the original quantity of paste being introduced into a printing process. As the plant was installed in several industries, it was possible to quantify the reduction of paste consumption. In the Eing plant in Germany, the savings amounted to over 2,200 tons of paste per year. An important effect therefore is that this large amount of waste was not being deposited in waste water as was previously the case.

The process has been implemented in full-scale in England, France, Germany and the Netherlands, with four plants in total. Other systems are being sold or purchased by textile printers in Europe and the USA. The market in these countries is extremely promising given the strict laws on pollution in the textile and clothing sectors.

Aside from the positive environmental benefits of TPR, the major benefit for industry was the cost savings on paste. Based on the figures of the current plants, a cost reduction of around. EUR 600,000 per year was estimated in view of paste consumption. As the investment costs of a TPR plant are around. EUR 680,000-850,000, this meant an expected return on investment in one to one-and-a-half years.

The project closed in January 1999. According to a recent follow-up report by the LIFE monitoring team, it is still being used in France, Germany and the Netherlands (the UK firm went into liquidation) and is still proving "very satisfactory". Moreover, despite the recent crisis in the textile sector - due in the main to increased competition from Asia - which has led to drastic reductions in investment in the sector, the system has also been purchased by a U.S client (name withheld).

Project Number:
LIFE96 ENV/NL/000224
Beneficiary: GSE B.V.
Total eligible cost: EUR 1,007,622.98
EC Contribution: EUR 260,932.45
Period: 01-Jul-1996 to 01-Jan-1999



3.6 The LIFE programme has allowed public authorities to improve the way they carry out their duties by utilising innovative methods to manage waste.

The LIFE programme has allowed public authorities to improve the way they carry out their duties, by the development of innovative methods for the management of waste. A large cluster – 63 LIFE-co-funded projects between 1992 and 2004 focused on the key role the public sector has to play in developing and implementing innovative waste management systems.

Here a successful example is provided by the harbour waste management system for refuse and cargo waste, developed by the Port Authority of Le Havre, France.

**LIFE example: public authorities and waste management (2)
“E-coport”**

LIFE beneficiary, the Port Authority of Le Havre, successfully implemented a new integrated harbour waste management system for refuse and cargo waste. This project was designed in accordance with the goals of The European Directive (2000/59/EC)³ of 27 November 2000, in ‘reducing the operating waste of ships and residual cargo dumped at sea by freighters using the Community’s ports’.

The project team worked with fifteen local public and private partners to design the e-coport system: an Internet-based system with specially developed software which enabled the forecasting and control of garbage/cargo waste flow in ‘real time’ and facilitated the immediate transmission of this information across the waste management network.

The management system handled the waste from source (the ships) through to the final phase of disposal, by integrating the various stages of transport, treatment, enhancement, storage and disposal.

The project has successfully reduced the volume of waste dumped into the sea at Le Havre, and has thus reinforced protection of the marine environment. The system generated a specific, optimised organisation of all of the port’s waste management agents, meeting the requirements of the ISO 14001 certification (policies, procedures and installations).

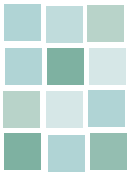
It represents the first link in a chain of European sites (harbour waste) within the scope of a maritime environment plan such as the European Spatial Development Perspective (ESDP). For more information see the website of the Port of Le Havre Authority at: <http://www.havre-port.fr>.

Project Number: LIFE00 ENV/F/000630
Beneficiary: Port Authority of Le Havre
Total eligible cost: EUR 1,178,225.00
EC Contribution: EUR 526,614.00
Period: 01-Jul-2001 to 01-Jul-2003

³ Directive 2000/59/EC of the European Parliament and of the Council of 27 November 2000 on port reception facilities for ship-generated waste and cargo residues - OJ L 332 , 28/12/2000 P. 0081 - 0090

E-coport project in the Port of Le Havre, France.





To conclude therefore, the previous sections have hopefully provided a clear indication of the way LIFE-Environment projects helped steer innovation and development in the treatment, disposal and management of waste in Europe between 1992 and 2004. "What field are we in?" examines EU policy in this area, and looks at efforts undertaken to meet the goals of the 6th EAP to cope with waste. This information is supported by data on different types of waste from recent EEA publications. The question "How was the LIFE funding allocated?" is answered by tables and figures outlining the distribution of funding and number of projects for the nine generic sub-themes identified from the LIFE database of projects. The question "What were the main impacts of the LIFE programme?" is answered by six key messages – supported by a wide range of successful projects from different Member States – demonstrating European innovation and technological environmental achievements in this field.

4. Looking ahead: LIFE-Environment in 2005 and onwards ...

The 6th EAP gives a high priority to sustainable use of natural resources and management of waste. The Third Assessment of Europe's environment shows that material use is still high, at levels that were recognised as unsustainable in Rio.

Looking to the near future, as laid down in the LIFE-Environment application guide 2005, the LIFE programme will therefore finance innovative projects aimed at the "prevention, re-use, recovery and recycling of waste of all kinds" in order to reduce the environmental impact of waste management. The priorities (in descending order) are as follows:

1. Waste prevention for significant waste streams, in terms of quantity and environmental impacts. This could involve innovative means for the:
 - Reduction of the amounts of waste;
 - Reduction of the risks associated with hazardous substances.

2. Re-use of products by:

- Demonstrating the acceptability of re-use systems in the market;
- Designing innovative re-use systems that respond to existing market demands.

3. Promotion of recycling through:

- Development of innovative systems for a more efficient sorting of waste to facilitate recycling of batteries, packaging, end-of-life vehicles and waste electric and electronic equipment;
- Removal of technical barriers and/or demonstrating new uses for recycled materials aimed at increasing the environmental benefits of recycling in particular for plastics, rubber and batteries, or other materials that are not recycled as normal practice.

LIFE Environment also gives priority to projects that reduce the environmental impact of products and services including the waste generation aspects. This priority is dealt with in chapter 4.3.



*French waste collection lorry
sorting refuse.*

4.5: Integrated Product Policy projects



Pollution prevention mainly involving the discharge of hazardous waste. Here a process is tried out in which mercury can be reused in the production process at a chemical plant.

1. What field are we in?

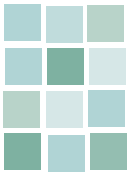
Integrated Product Policy (IPP) aims to reduce the environmental impact of products and services throughout their lifecycles.

Background to EU Integrated Product Policy (IPP)

Work on the EU Integrated Product Policy (IPP) started as early as 1998 when the issue was discussed with stakeholders. The following year, IPP was considered at the Weimar Informal Meeting of Environment Ministers. The Presidency conclusions from the meeting welcomed the Commission's intention to adopt a Green Paper and emphasised that improving the market conditions for greener products on the European market would also help to strengthen the competitiveness of European industries. The Commission adopted the Green Paper in February 2001 and launched a stakeholder consultation exercise on its contents. In 2003, The Commission issued a communication to the Council and the European Parliament on Integrated Product Policy.

The IPP approach has been developed gradually over the last decade and is generally recognised as being a potentially very effective way to address the environmental dimension of products. This approach is based on five key principles:

- > **Life-Cycle Thinking** – considers a product's life-cycle and aims for a reduction of its cumulative environmental impacts - from the 'cradle to the grave'. In so doing it also aims to prevent individual parts of the life-cycle from being addressed in a way that just results in the environmental burden being shifted to another part. By looking at the whole of a product's life-cycle in an integrated way, IPP also promotes policy coherence. It encourages measures to reduce environmental impacts at the point in the life-cycle where they are likely to be most effective in reducing environmental impact and costs for business and society.
- > **Working with the market** – setting incentives by encouraging the supply and demand of greener products so that the market moves in a more sustainable direction. This will reward those companies that are innovative and committed to sustainable development.
- > **Stakeholder Involvement** – aims to encourage all those who come into contact with the product (i.e. industry, consumers and government) to act on their sphere of influence and to encourage co-operation between the different stakeholders. Industry can better integrate environmental aspects in the design of products, while consumers can assess how they can purchase greener products and how they can better use and dispose of them. Governments can set the economic and legal framework conditions for entire national economies and also act directly on markets, for instance by purchasing greener products.
- > **Continuous Improvement** – improvements can often be made to decrease a product's environmental impacts across its life-cycle, whether in design, manufacture, use or disposal, taking into account the parameters set by the market. IPP aims for a continuous improvement in these rather than setting a precise threshold to be attained. As a result, companies can set their own pace and can focus on the most cost efficient improvements.



> **A Variety of Policy Instruments** – the IPP approach requires a number of different instruments because there is such a variety of products available and different stakeholders involved. These instruments range from voluntary initiatives to regulations on the local to the international scale. Within IPP, the tendency is clearly to work with voluntary approaches, although mandatory measures might also be required. The determining factor is the effectiveness of the tool to achieve the desired result with regard to sustainable development.

[Source: European Commission, 2003, "Communication from the Commission to the Council and the European Parliament Integrated Product Policy Building on Environmental Life-Cycle Thinking", COM(2003)302 final]

Natural resources provide the basis for the three strands of sustainable development – economic, social and environmental. The use of resources can reduce the quality of the environment to an extent that can threaten ecosystems and the quality of human life.

The sustainable management of natural resources has been a priority issue since the 1992 Rio Conference, and was re-emphasised at the 2002 Johannesburg Conference. The Sixth Environmental Action Programme (6th EAP) gives a high priority to sustainable use of natural resources and formulates two objectives:

- > To ensure the consumption of renewable and non-renewable resources does not exceed the carrying capacity of the environment;
- > To achieve a de-coupling of resource use from economic growth through significantly improved resource-efficiency, an increasingly knowledge based economy using ICTs, and waste prevention.

The Commission is currently preparing a comprehensive strategy on sustainable use of natural resources, due later in 2005.

IPP projects aim for life-cycle environmental improvements. The picture shows the new regeneration unit of the Sanazzaro refinery in Italy.

Use of resources: Key Facts & Figures

In relative terms, the use of resources over the last two decades has been de-coupled from economic growth in Europe. However, in absolute terms, material use is still high, remaining at levels that were recognised as unsustainable in Rio (The World Conference in Rio de Janeiro in 1992.)

Western European and central and eastern European economies have, over the past 20 years, increasingly imported their raw materials, which means that the environmental burden associated with extraction is moved to other parts of the world. The EECCA countries (the 12 countries of Eastern Europe, Caucasus and central Asia) are some of the main exporters of raw materials to the European Union.

- > Fossil fuels are a major component of direct material input in both EU (15) and new member/accession countries, respectively accounting for 24% and 31% of the total.
- > Direct material requirement¹ is around 16 tonnes per capita in the EU (15), of which imports grew particularly fast during the nineties and currently constitute almost 40%. Imports of goods in new member/accession countries increased by almost 30% in this period.
- > The EU is increasingly importing from EECCA countries. Currently, almost 12% of the EU (15's) 'physical' imports originate from the EECCA countries, particularly as regards fossil fuels and metals.

[Source: Europe's Environment: the third assessment, EEA, 2003]

¹ Data revised by IPP Thematic Unit, European Commission, DG Environment 05.01.2005



2. How was the LIFE funding allocated?

Some statistical information on LIFE and IPP

As the table shows, 139 LIFE-Environment projects out of 1,404 (10%) LIFE I, II and III projects were undertaken specifically on issues related to Integrated Product Policy between 1992 and 2004. This category also includes projects related to life-cycle management and to environmentally sound consumption. The total investment planned by those projects (many are still ongoing) is EUR 210.62 million for a Community contribution of EUR 68.47 million. The “leverage” capacity of this type of project means one euro invested by the EU will be matched by just over two euros from other private and public funds.

Overall, eco-friendly products, eco-design, and green financial products account for the largest cluster of LIFE projects: 55, (39%) of the total. The average EC contribution is 28% of total project costs.

The second largest cluster is for projects covering sustainable tourism – accounting for 40 LIFE projects (29%) over the period 1992-2004. This category includes projects focusing on the development of criteria for green certification of specific areas, sustainable tourism and environmental restoration of specific regions, e.g. a national Park, to projects supporting tourism enterprises seeking to introduce eco-labelling and environmental management schemes. The average EC contribution here is 31% of the total project costs.

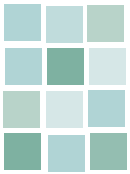
The third largest cluster of projects concerns eco-labelling, eco-market and consumer awareness. Together these categories account for 24 LIFE projects, (17%) of the total. This includes projects dealing with tourism or product eco-labelling on both a regional basis and on a pan-European scale, projects covering environmental, social and economic action for sustainable development, and projects dealing with green public procurement.

The fourth cluster addresses sustainable building projects accounting for 20 schemes, (14%) of the total.

Analysing the trends of IPP projects as a whole, it appeared that of the three approaches identified, LIFE beneficiaries mainly developed methods-oriented projects (58%), such as environmental impact assessment and management and eco-labelling. This was followed by technology-oriented projects (33%) and awareness-raising and participatory projects (9%).

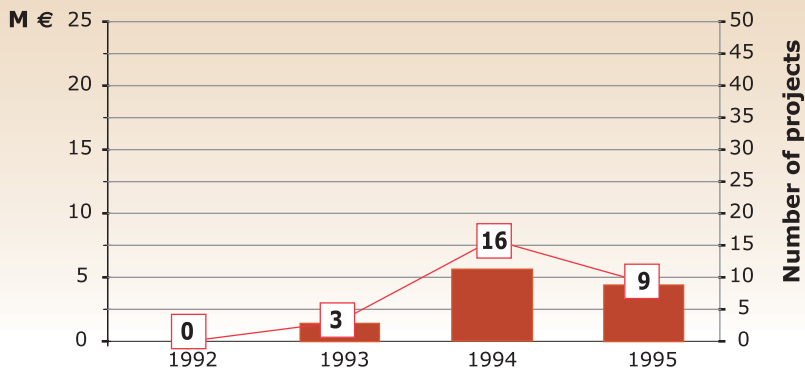
Table 5: Integrated Product Policy projects financed by LIFE-Environment 1992-2004

IPP projects by sector (1992-2004)	Number of Projects financed	Total cost of projects (EUR Million)	Total EC Contribution (EUR Million)	Percentage EC contribution	Average cost per project (EUR Million)
Eco-friendly products – Eco-design – Green financial products	55	107.50	29.74	28%	1.95
Sustainable tourism	40	49.11	15.32	31%	1.23
Eco-labelling – Eco-market – Consumer awareness – Green public procurement	24	29.11	13.89	48%	1.21
Sustainable building	20	24.22	9.19	38%	1.21
TOTAL/MEAN	139	210.62	68.47	33%	1.5

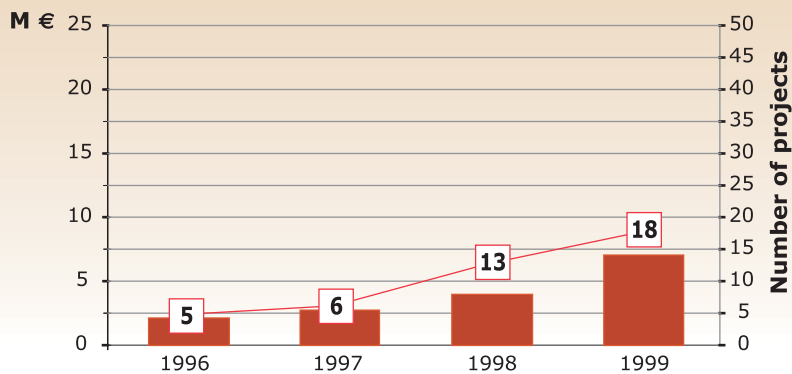


Integrated Product Policy projects

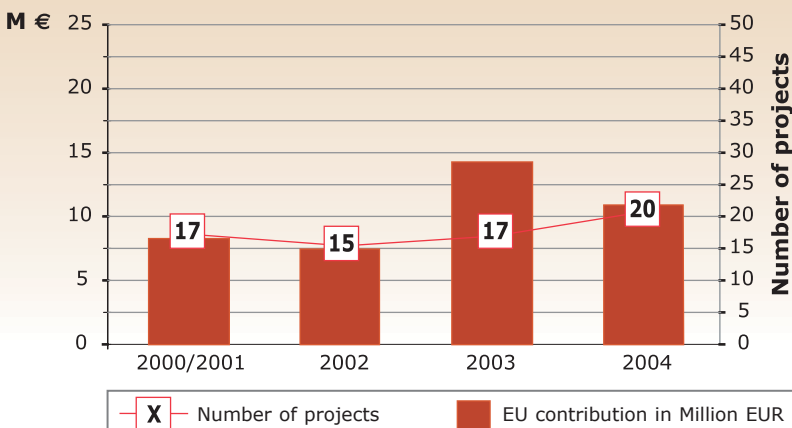
LIFE I



LIFE II

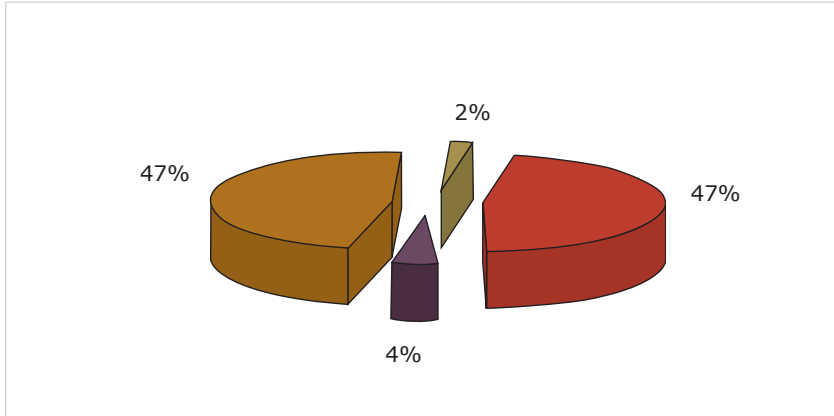


LIFE III

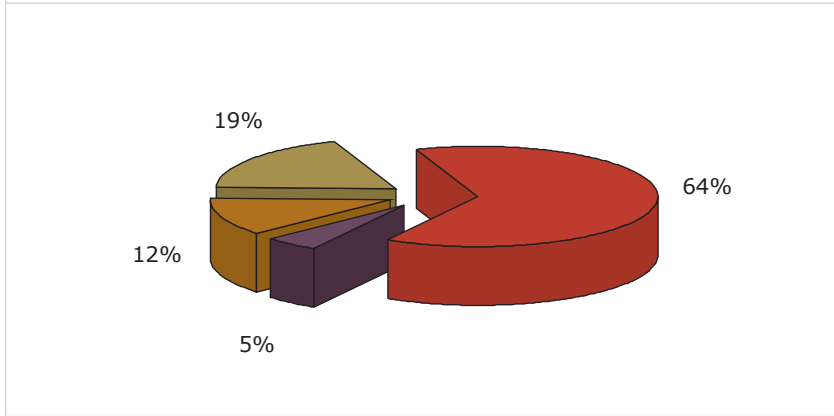


X Number of projects
 EU contribution in Million EUR

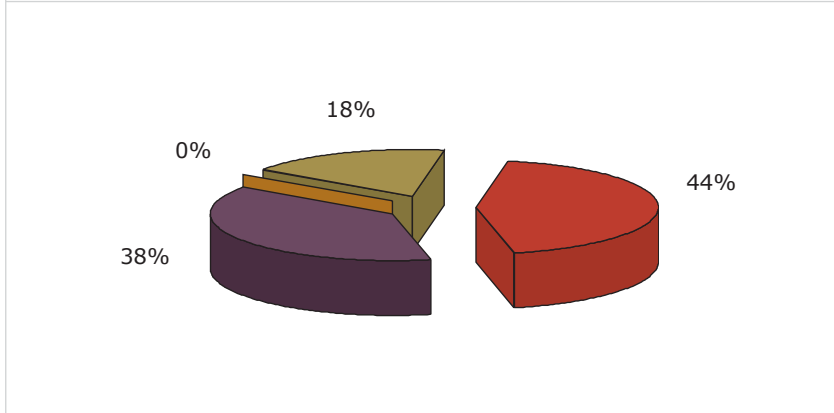
Figure 15-a. Integrated Product Policy (IPP) projects in EUR million for LIFE I to LIFE III to 2004, with line superimposed to illustrate the total number of IPP projects for that year.



**LIFE I -
EU total funding in %**



**LIFE II -
EU total funding in %**



**LIFE III -
EU total funding in %**

- Eco-friendly products - Eco-design - Green financial products
- Eco-labelling – Eco-market - Consumer awareness - Green public procurement
- Sustainable tourism
- Sustainable building

Figure 15-b. Integrated Product Policy – percentage of EC co-funding by sub-sector in LIFE I to LIFE III to 2004.



3. What were the main impacts of the LIFE programme in the IPP sector?

3.1 LIFE has helped several industrial sectors to apply and develop IPP tools and improve the lifecycle impact of their products

LIFE Environment has funded many projects in which industries develop tools for applying lifecycle management in their business. Typically, market leaders in various types of consumer industries implemented such projects that result in sustained market gains in combination with environmental and social benefits. Beneficiaries are located across Europe including, in recent years, in the new Member States. LIFE has created a vast cluster of experiences supporting the development and implementation of the EU's Integrated Product Policy.

One successful example is a Flemish LIFE project based on the eco-design concept - allowing companies to integrate environmental issues at an early stage of product development. This in turn, reduces the overall environmental impact of products over their entire lifecycle.

Table 5.1: Sample of LIFE projects that helped improve lifecycle impact of products

Project Title	Country	Project Number
Innovative collection system and Life Cycle Assessment for waste lube oils	GR	LIFE02 ENV/GR/000360
Eco-Efficiency evaluation of new and existing products (DANTES)	S	LIFE02 ENV/S/000351
Eco-friendly Furniture	IT	LIFE00 ENV/IT/000034
Demonstration and dissemination of eco-design in industry as support for a sustainable growth	B	LIFE99 ENV/B/000639

LIFE example: improving the lifecycle impact of products (1) “Demonstration and dissemination of eco-design in industry as support for a sustainable growth”

This project sought to enable Flemish manufacturers to increase their knowledge and experience in the field of sustainable product-design (eco-design). Since very few companies in the region had taken initiatives in this area, there was a need for a large-scale demonstration project with high visibility.

Some 50 companies expressed interest in the concept. The beneficiary, together with project partners - VITO (The Flemish Institute for Technological Research) and VDAB (the Flemish Employment Office) - were able to develop and apply a ‘Quick Scan’ screening of 15 companies that participated in the first phase of the project. (This is an important early-stage consideration for eco-design as it can prevent wasted efforts.)

Following the results of the screening, 10 companies were selected to take part in the second phase, which involved a more detailed eco-design analysis of one of their products. On the basis of these results, five companies were accepted for participation in the final phase, in which the improved product concept would be further developed. These were: Ecobouw (wood frame construction); Mc Bride-Yplon (detergents and cosmetics); Recticel (insulation material); Reznor Europe (air heaters); and Toplight (lighting).



Wood frame construction material by Ecobouw.

The results achieved by the participating companies were positive. These included: improved products; a reduction in costs; material savings; an improvement in recycling; and new market opportunities. By organising several information sessions and workshops, by supporting the development of a website (<http://www.factor10.be>), by publishing a manual and by dissemination of an Ecodesign information brochure in the Flemish Environmental Journal “Ecotips”, the project offered direct information to at least 5,000 Flemish companies. In addition, by making the information available to product developers and training centres, knowledge about of eco-design was further disseminated.

Project Number:
LIFE99 ENV/B/000639
Beneficiary: GOM West-Vlaanderen
Total eligible cost: EUR 738,474.81
EC Contribution: EUR 311,395.58
Period: 15-Sep-1999 to 28-Feb-2003

Another example of improving the life-cycle impact of a product is illustrated by the successful Italian “Eco-friendly furniture” project. Here, the aim was to stimulate awareness of the importance of an ‘eco-friendly’ choice from design to end-of-life disposal, while at the same time proving the product’s technical, economical and financial validity.



Striking ‘Dema-lips’ chair by Dema.

Well-designed and eco-friendly kitchen unit.



LIFE example: improving the life-cycle impact of products (2) “Ecofriendly Furniture”

Until relatively recently, the furniture industry has been largely excluded from broad-based environmental awareness campaigns, with few projects attempting to improve the manufacturing process from an ecological standpoint. Yet, the environmental implications for air, water and land, as well as for noise and waste ensuing from production are self-evident. In addition, continued logging activities, with the removal of wood from forests risking extinction, leads to fragmentation and deterioration.

At the same time, efforts to improve European consumers’ awareness about ecologically-improved furniture products have been sadly lacking. The environmental problem is particularly pressing in Tuscany, which has over 10,000 firms in the sector. But, the impact is felt throughout Europe with Spain, France, Germany and Scandinavia ranking among the world leaders in furniture-making.

The beneficiary was Consorzio Casa Toscana, a privately-owned consortium, established in 1999, to promote furniture manufactured in Tuscany. The goal was to develop at least 15 prototypes (with demonstration characteristics) of eco-friendly and eco-efficient products that would contribute to a reduction in pollution and in consumption of energy and materials.

The Eco-friendly project achieved some significant successes. These included:

- > Development of 15 prototypes of various furniture items with a reduction of environmental impacts varying between 10% and 50%.
- > Acquisition of a method based on the organisation of process and environmental information.
- > Establishment of good collaboration with designers.
- > Creation of a constructive relationship between innovation organisations (universities and research institutes) and small businesses through the mediation of service centres.

The improvements achieved were attributable to: recycling material, use of solid wood, improvement of paint or glues, reduction of wastes, reduction of packaging, reduction of use of polyurethane materials, use of mono-material, and reduction of use of material for each functional unit.

The reduction of the cost for the prototypes’ production was due to the use of lower-quality materials, using less material, energy savings in the use of machinery, lighting systems, heating, optimising the use of the warehouse, added-value of offering an environmentally compatible product, improvement of work quality.

These results provided more weight to current legislation on the use of greener material in furniture-making. A number of well-known furniture designers assisted some of the firms. These included: George Sowden for Segis; Piergiorgio Cazzaniga for Dema; Carlo Bimbi for Bosal; Delfinetti Design for Giovanetti; and Luca Scacchetti for Halto. This meant that most of the prototypes developed showed both a reduced environmental impact, but also had an original design - attractive to the market.

In a follow-up interview in April 2004, the beneficiary reported that, following necessary modifications to the prototypes for mass production, 12 project partners (Arrimobili, Artexport, Dema, Bosal, Fattorini, Giemmegi, Gilma, Giovanetti, Graffiti, Halto, Segis and Toncelli) have successfully introduced the prototype items of furniture. The website is still active at:

<http://life-ambiente-ecofriendly-furniture.consorziocasatoscana.it/>

Project Number:

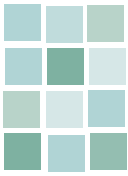
LIFE00 ENV/IT/000034

Beneficiary: Consorzio Casa Toscana

Total eligible cost: EUR 1,526,157.23

EC Contribution: EUR 676,988.00

Period: 01-Dec-2000 to 30-Sep-2002



3.2 LIFE has supported the demonstration of several products with spectacular environmental benefits that became market success stories

The beneficiaries of projects with spectacular environmental benefits are typically SMEs that realise breakthrough ideas in their sector leading to redesigns or new designs of products and services.

With LIFE funding, the beneficiaries were able to move faster from the pilot stage to the market introduction stage. LIFE funding can leverage significant other support: the amount of funding is relatively limited while the access to regular funding is in many cases blocked: because of the risk and undefined outcome of the demonstration activities, beneficiaries cannot obtain funding from venture capital, investors, industry or banks.

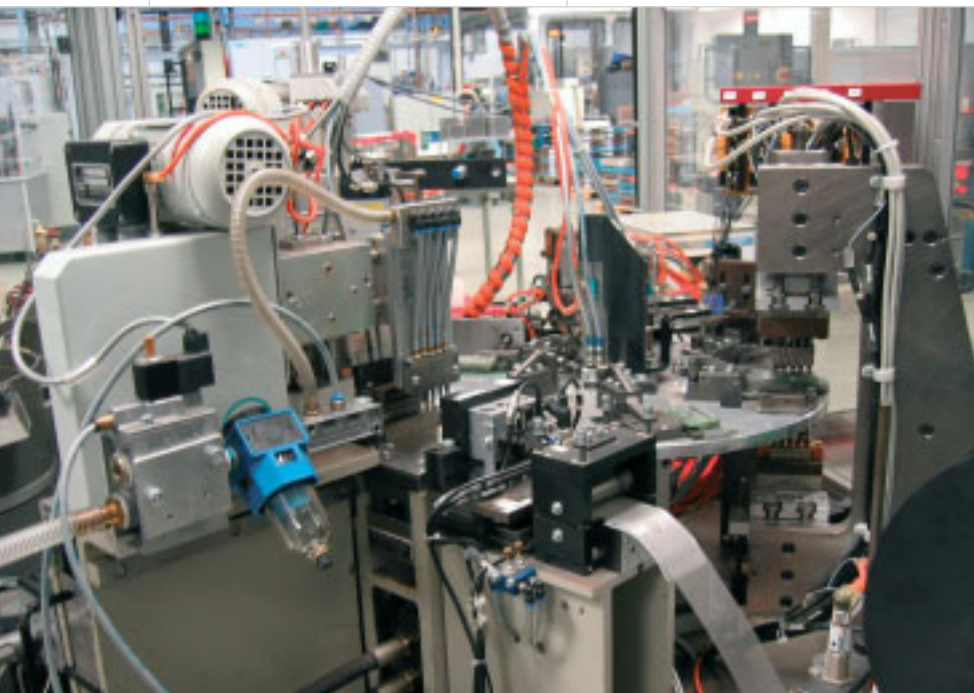
Project Title	Country	Project Number
Paperfoam: demonstration of the applicability of an innovative technology to produce packaging made of natural fibres and starch, which are both environmentally-friendly and of a high quality	NL	LIFE99 ENV/NL/000232
The RESPECT project: Re-use of second-hand car components in company car fleets	NL	LIFE99 ENV/NL000233
Environment friendly production of rechargeable lasting lithium-ion button cells	D	LIFE98 ENV/D/000500
Pilot realization of the material cycle of friction materials	D	LIFE98 ENV/D/000537
The PLATO wood upgrading process	NL	LIFE95 ENV/NL/000277

Table 5.2: Sample of LIFE projects with spectacular environmental benefits

LIFE funding has two other crucial benefits in this area:

- > LIFE funding means recognition of the project idea at the international level; and
- > The high requirements of LIFE proposals means that beneficiaries have to think out a comprehensive and well-balanced plan to implement the project, increasing its chances of success.

A good illustration of this is the Dutch **RESPECT** project. Beneficiary, Achmea SchadeService - the car insurance department of the Netherlands insurance group, Achmea - succeeded in realising the large-scale, re-use of second-hand car components. This led to a 'win-win' situation, with significant environmental and economic benefits.



Inside VARTA's Ellwangen plant in Germany (LIFE98 ENV/D/000500)

LIFE example: market success stories (1)

"RE-use of Second-hand car components in company car fleets - RESPECT"

Damaged cars and end-of-life vehicles result in a build-up of huge quantities of used materials. Approximately 25% of this waste (the so-called shredder residue) is hazardous and goes to landfill. Before the project was launched, there was no organisation in the country that professionally repaired substantial parts of damaged cars with the use of second-hand parts. All vehicles of insurance and car lease companies were repaired with new parts.

The main goal of the **RESPECT** project was to demonstrate the large-scale, re-use of car parts, via a partnership between Achmea and other sectors of the automotive chain (car dismantlers, body shops, owners of car fleets and insurance companies).

The specific goals of were to demonstrate:

- > Re-use of second-hand car parts on a large-scale was economically, ecologically and technically feasible and viable;
- > Some 80% of all damaged cars (for vehicles more than two years old) could be repaired with re-cycled parts, without compromising quality standards;
- > An intelligent logistics system for the handling and availability of used car parts, quality assurance systems and communication lines.

The project involved a so-called 'green car insurance policy' a simple concept whereby clients with a green policy had their car repaired with recycled parts. However, in order to introduce the concept, the insurance company had to be able to guarantee the overall result. This required:

- > Installation of a system for matching the supply and demand of used parts;
- > Selection, certification and education of car dismantlers;
- > Organisation of efficient logistics;
- > Guarantee of the quality of the recycled parts;

- > Guarantee of the quality of the repair job;
- > Developing a revised business model for body shops (as the profit margin on new parts is larger. As a consequence, the insurance company must raise its labour rate, to compensate for the loss of margin on parts.)

The project produced excellent results. 'Green policies' proved successful for all parties, including end-users. In early 2002, some 75,000 'green policies' were sold and 6,000 repairs were carried out with recycled parts. Achmea demonstrated that the large-scale re-use of used car parts was possible. The IT-system developed for the project made effective and efficient communication possible between all the parties in the chain. While cost savings are not yet completely in line with expectations, they are sufficient to make the profits and returns on green policies acceptable and within insurance standards.

The re-use of used car parts also led to significant environmental savings. These included:

- > A reduction of emissions from painting: The reduction of paint usage and thus of the related emissions is estimated at 50%. Used parts mostly require less paint layers and sometimes even no layers when they are directly available in the right colour;
- > Material savings: In 2001, 1,642 cars were repaired with used parts, containing generally 60% Ferro- and non-Ferro materials, 25% plastics and 15% other components. As the average weight per repair is 30 kg, 60 tonnes of material was saved annually.

In a follow-up questionnaire completed by the beneficiary in March 2005, Achmea / Centraal Beheer reported it is still selling the green car insurance policies and still has the system for repair with used parts in place. As far as it is aware, the system remains unique world-wide.



Stiba warehouse for dismantling cars – part of the Achmea green repair network.

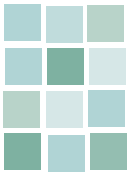
Recent activities have been mainly focused on intensifying the commercial activities for the sale of the green policies. The system, called 'Groene service', is open for cars older than 4 years. Achmea has managed to maintain a portfolio of 75,000 policies (and has thus been able to attract new users for those who bought new cars or cars younger than 4 years and so had to leave the system). Whereas at project closure (early 2002), it had carried out some 6,000 repairs with used parts in the project period, this figure has now jumped to 7,000 repairs in 2003 and a further 6,200 in 2004. Finally, the revenue/cost ratio at the end of 2004 showed the lower price of a green policy, compared with a traditional policy was justified. For more information, see:

<http://www.centraalbeheer.nl>
(under 'groene service').

Project Number:

LIFE99 ENV/NL/000233

Beneficiary: Achmea SchadeService**Total eligible cost:** EUR 651,628.39**EC Contribution:** EUR 176,293.61**Period:** 15-Nov-1999 to 15-Nov-2001



A second example is provided by a breakthrough German initiative for the large-scale production of lithium-ion button cells, or batteries, for use in 'communication devices' and PCs. These battery cells are environmentally-friendly during their entire life-cycle - an innovation both nationally and for the whole of Europe.

Embracing VARTA's 'breakthrough' technology.

LIFE example: market success stories (2)

"Environment friendly production of rechargeable long-lasting lithium-ion button cells"

The LIFE project was developed by international enterprise VARTA Microbattery GmbH. It involved research by the German-based group into large-scale production of rechargeable long-lasting lithium-ion button cells. The research at VARTA's Ellwangen, Germany plant was based on market forecasts, in 1998, of a demand for their application in 'communication devices' and PCs, of approximately 120 million batteries for that year, with an annual increase of up to 10%.

Prior to the project, nickel-cadmium button cells and lithium-primary button and round cells were used. It was argued that these could be substituted by lithium-ion button cells, which are free of cadmium and mercury and have a higher shelf-life. Other advantages of lithium-ion button cells include: low emissions during production; the environmentally-friendly materials; the substitution of heavy metals (cadmium, nickel, cobalt); and the saving of material. (The older lithium-primary button cells need > 150% more material compared to the new secondary type).

The project's main aims were to:

- > Consider the environmental aspects of the development, production, use and disposal of the new batteries.
- > Use environmentally-friendly materials and to preserve resources, by reducing material usage, extending the life-cycle, and facilitating battery-recycling.
- > Use new product technologies and to secure European leadership for the production of this type of battery.
- > Create a base for the development of future systems (Lithium-Polymer-Battery).

The development and implementation of the project was completed successfully in just under one-and-a-half years, after which the rechargeable long-lasting lithium-ion button cell went into production. The newly-created production area functioned efficiently and delivered high-quality button cells, which have been well received in the marketplace.

At the production plant, harmful emissions and material wastage have been virtually eliminated. This was achieved by using environmentally-friendly materials, by automating the production-flow with integrated reprocessing circuits, and by using modern exhaust and wastewater treatment processes.

Following the regulation for the taking back of spent batteries, in accordance with the German Battery Decree and the revised draft of the EC-Battery Directive (IP/03/1596), the collection and recovery, or separate disposal, of spent lithium-ion button cells was also guaranteed.

Project Number:

LIFE98 ENV/D/000500

Beneficiary: VARTA Gerätebatterie (Microbattery GmbH)

Total eligible cost: EUR 3,941,138.38

EC Contribution: EUR 412,425.89

Period: 01-Feb-1998 to 30-Jun-1999



3.3 LIFE has supported the demonstration of several innovative financial schemes stimulating environmentally responsible behaviour.

Several LIFE projects have put in place financial instruments to influence consumers and other actors towards environmentally responsible behaviour. These aspects are closely linked to 6th EAP priorities of "Helping consumers make informed choices" and "Empowering citizens and changing behaviour". Most LIFE schemes had an extremely high demonstration value, as they were first-time experiences with innovative financial instruments. The LIFE programme also helped fund some projects that helped to build up experience with green procurement - another item related to IPP.

One example of this was the development of a catalogue for the application of environmental criteria in public procurement. This is significant because environmentally-sound procurement in public authorities contributes to the protection of the environment and promotes the development of sustainable consumption patterns. This has major economic implications, as the concentrated and combined purchasing power of public authorities is around 16% of the EU's GDP, or roughly EUR 1,450 billion

Table 5.3: Sample of LIFE projects demonstrating financial instruments & green procurement

Project Title	Country	Type of project	Project Number
Demonstration project PlusPunten Rotterdam	NL	Financial instruments	LIFE99 ENV/NL/000232
Project for implication of social and economic partners in the sustainable and multifunctional management of forests	E	Financial instruments	LIFE99 ENV/NL000233
ECOLIZ - Prevention of animal dejections related pollutions	F	Financial instruments	LIFE98 ENV/D/000500
Criteria Catalogue for the Consideration of Environmental Protection in the Procurement and Placing of Contracts	A	Green procurement	LIFE98 ENV/D/000537

**LIFE example: green procurement
"Criteria Catalogue for the Consideration of Environmental Protection in the Procurement and Placing of Contracts"**

The project beneficiary brought together various scientific and consulting institutions in Austria, with a view to considering how the experiences and knowledge of purchasers of public authorities could be combined with examples of green purchasing in Europe.

Specific project objectives included: compiling best-practice case studies of green purchasing in European municipalities; discussing the criteria and instruments with interested parties; and then merging these criteria and instruments into a criteria catalogue.

The catalogue published both electronically and in printed format covered:

1. Consumption of materials and paper products for office and school;
2. Electrical devices and equipment, heating;
3. Buildings and equipment;
4. Movable indoor equipment;
5. Infrastructure for drinking, waste and re-circulated water;
6. Laundry and cleaning products.

In addition, a legal framework analysis was carried out, with special attention to the European Guidelines.

The project achieved all of its objectives. The criteria catalogue was published in June 2001.



Check out the "Check-it!" criteria catalogue

The English language version of the "Check it!" criteria catalogue provides: up-to date information; best practice case-studies; clarification on legal issues in the EU; support for the green purchasing argument; and text and check-lists for use in calls for tender.

The Austrian original version was particularly targeted towards the needs of large-scale users (companies, organisations, and public administrations). It provides support for calls for tender and planning, but also for small-scale procurement. In addition, the English summary and translation turns to multipliers on a European level, offering them a state-of-the-art overview to be disseminated and used for political action to reinforce the green purchasing movement. The project's website can be viewed at: <http://www.oekoeinkauf.at/>. The English version of the project's website can be viewed at: <http://www.oekoeinkauf.at/engl/>

Project Number: LIFE98 ENV/A/000551
Beneficiary: Austrian Ministry for the Environment, Youth and the Family
Total eligible cost: EUR 444,297.46
EC Contribution: EUR 222,148.73
Period: 01-Oct-1998 to 01-Jan-2001



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Advertising helps spread the EU Flower-label message.

Project Title	Country	Project Number
European Flower Week-Campaign on the EU Eco-label	DK	LIFE03 ENV/DK/000052
Eco-labels for Sustainable Tourism in Europe: demonstrating how eco-labels can move the European tourism market towards sustainability	NL	LIFE00 ENV/NL/000810
Strategies and Tools Towards Sustainable Tourism Mediterranean Coastal Area	IT	LIFE00 ENV/IT/000167
Integrated Environmental Management for Sustainable Development in the alpine region of Grosses Walsertal	A	LIFE00 ENV/A/000249
Green Flag for Greener Hotels	F	LIFE98 ENV/F/000338

Table 5.4: Sample of LIFE projects that facilitated initiatives in eco-labelling

3.4 LIFE has facilitated several breakthrough initiatives of eco-labelling

The 6th EAP gives priority to 'Helping consumers make informed choices' and 'empowering citizens and changing behaviour'. As defined in the Integrated Product Policy, the Community's role here is to support EU-wide tools and frameworks to provide consumers with product information. To this end, the Commission is running a European eco-labelling scheme that provides consumers with reliable and easily understandable information on which to make their product choice.

The presence of the EU flower eco-label on a product tells the consumer that the product is certified more environmentally friendly than most other similar products across the whole of its life-cycle. According to EU data for the period 1998-2004¹ for the eco-label, 2004 looks set to be the most successful year ever for the European eco-label, with the number of articles/items sold up five-fold since 2002. There are currently an estimated 400 million products marketed under the label in the EU, with an ex-factory sales value of EUR 700 million.

Danish schoolchildren give thumbs-up to the European Flower Week-Campaign.



© Lisbeth Hollen

¹ Estimated data based on latest known figures. Final data for 2004 will be published in 2005

The LIFE programme supports a small cluster of experiences in the development and promotion of specific eco-labels – 17 projects. The "**European Flower Week-Campaign on the EU Eco-label**" is a recently-completed, LIFE project in Denmark, aiming at assisting consumers in making informed decisions when choosing environmentally-friendly products, while at the same time building networks and simulating exchange of experience between stakeholders.

In-store promotions were part of the wider EU Flower Week Campaign.



© Lisbeth Holten

LIFE example: eco-labels

"European Flower Week-Campaign on the EU Eco-label"

The objective of the EU Eco-label is to help European consumers to easily identify environmentally-friendly products. The EU eco-label is a tool for making informed choices that can significantly reduce the environmental effects of our consumption.

In order to provide European consumers with knowledge of the eco-label and thereby motivate them to buy eco-labelled products, the national competent bodies in France, Italy, The Netherlands, UK, Ireland, Belgium, Austria, Sweden and Denmark initiated the project.

A two-phase strategy was developed, focusing at boosting both supply and demand of Flower-labelled products.

The first phase of the project aimed to stimulate the supply side, as well as motivating licence-holders and other Flower-ambassadors to actively contribute in the EU Flower Week. The primary target groups were manufacturers and retailers. Actions and structures were designed to establish partnerships and networks, and through dialogue, obtain support for the EU eco-label and the campaign. The visibility of the eco-label was increased by making sure that more licensed products were available in more stores. By using networks, manufacturers and retailers shared experiences and had the opportunity to discuss eco-labelling with different partners.

Phase two was a simultaneous consumer campaign within the framework of a European Flower Week, held 18-24 October 2004, where several activities took place in all the participating countries. The idea was that the best results would be obtained through several simultaneous activities. Activities took place in schools and stores, supported by advertising and PR. A set of campaign materials with complementary messages was prepared, and the partners and networks, in terms of NGO's, industrial federations, licence holders and retailers, were encouraged to campaign in the same week.

EU Flower Week has played an important role in the recent positive developments of the Flower, where the number of companies awarded the EU-eco-label has increased by 60% since the project started in 2002, and the value of the labelled product sold has more than doubled. By the end of the project, 217 companies had been awarded the Flower.

Through the EU Flower Week project a large range of retailers, manufacturers and NGOs have successfully been engaged in the promotion of the label. Approximately 250 organisations in nine countries were involved actively in the campaign. These include 40 retailers with about 5000 shops, 50 NGOs, 77 companies (licence holders) and 83 competent bodies, public organisations etc.

Through the EU Flower Week project a common concept for communication on the Flower was developed, tested and used. The graphic toolbox has already been widely accepted among the Flower stakeholders in Europe. A wide range of promotional material and a significant number of internet sites have also been developed. Experience has proved that the impact of marketing activities increases significantly when different actors co-ordinate their activities and unite their efforts. The multiple tools developed by the participating countries during the project provide a firm foundation for co-ordinated marketing activities for the EU eco-label in the future. See beneficiary website at: <http://www.mst.dk/>

Project Number:

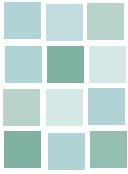
LIFE03 ENV/DK/000052

Beneficiary: Danish Environmental Protection Agency

Total eligible cost: EUR 3,137,177.00

EC Contribution: EUR 1,549,104.00

Period: 01-Dec-2002 to 31-Jan-2005



3.5 LIFE has enhanced sustainable tourism across Europe through a high number of projects on this issue

Tourism and travel are two of Europe's biggest and most rapidly expanding industries, expected to double in size over the next decade. The interest in visiting cultural, heritage and natural sites has grown in parallel with an increasing concern for the environment by consumers and host nations. Europe has, for instance, some half a million accommodation providers that both impact on the environment, yet depend directly on the quality of their natural surroundings for their success.

Youngsters are encouraged to recycle on the beach of Rimini.



LIFE example: sustainable tourism "Strategies and Tools Toward Sustainable Tourism in Mediterranean Coastal Areas"

Rimini, in the province of Emilia-Romagna, Italy, and Calvià on Spain's Balearic Islands are both regions that have undergone intensive and rapid tourism development. Jointly receiving some 40 million tourists every year, they rank among the leading holiday destinations in the Mediterranean Basin. The main objective of this project was to develop a model for sustainable tourism for these two districts that would also be applicable to other cities and local authorities in the Mediterranean region. It would do this by:

- > Combining tourism and European environmental strategies, starting from the study and the implementation of ICZM (Integrated Coastal Zone Management) Plans of Rimini and Calvià;
- > Creating a network of mass-tourism destinations to encourage sustainable tourism improvements;
- > Developing and Implementing environmental quality labels for hoteliers, taking into account their specific characteristics and economic needs; and
- > Raising awareness of the tourism market and of the advantages of sustainable tourism so that Tour Operators and visitors will be involved in the continuous improvements of their holiday destinations.

The participation of public and private stakeholders – and more generally that of all local communities – throughout the various phases of the project (analysis, definition of problems, identification of the actions to be taken and their implementation, etc.) was a key part of the process, within Local Agenda 21(LA21) guidelines.

The project partners were the local authorities of Rimini and Calvià; the Ambiente Italia research institute; and Federalberghi, the main Italian association of hoteliers. The project team was also aided by ANPA, now APAT (The Agency for Environmental Protection and

Technical services) – an international agency charged by the European Commission with preparing the proposal for an EU Eco-label for Tourist Services. (The agency was involved in the analysis and the evaluation of the project data and also participated in the meetings with the operators and in the drawing up of guidelines on the scheme's eco-label.)

When it closed, the project had successfully met its overall objective and had created a network of cities and local authorities committed to sustainable tourism development. This network continues today, comprising 16 members from across the Mediterranean region (e.g. Israel, Turkey, Greece, Italy, Tunisia and Spain).

A range of other results were also achieved:

- > Development of integrated coastal management plans for Rimini and Calvià
- > Implementation of eco-label and green purchasing criteria in the two districts,
- > Hosting of a series of sustainable tourism conferences
- > Awareness-raising actions to make tourists and tour operators more aware of environmental concerns, including the publication of "Ten Golden Rules of the Sustainable Tourist", a European first, with a print-run of 150,000 copies in 2003.

In recognition of the project's achievements, in 2003 the beneficiary was awarded 1st prize in the "Carmen Diez de Rivera" European Award for Sustainable Tourism. See:

<http://www.turismosostenibile.provincia.rimini.it/>

Project Number:

LIFE00 ENV/IT/000167

Beneficiary: Provincia di Rimini (Province of Rimini)

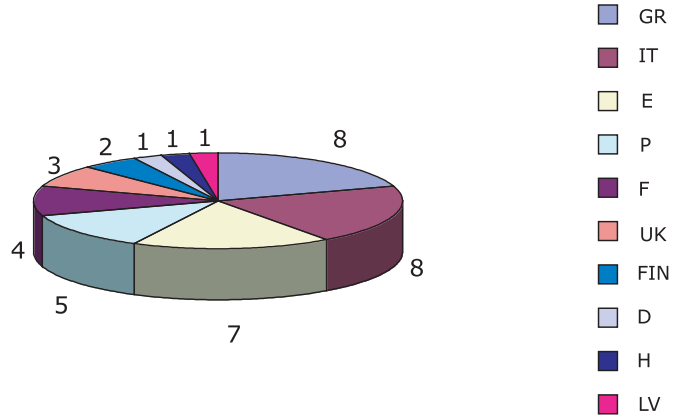
Total eligible cost: EUR 1,136,400

EC Contribution: EUR 559,200

Period: 30-Nov-2000 to 31-Oct-2003

LIFE has co-funded a large cluster of projects on sustainable tourism: 40 projects between 1992 and 2004. Many of these projects ran in Southern Europe: Greek, Spanish, Italian and Portuguese beneficiaries implemented 28 projects.

Sustainable Tourism Projects



3.6 LIFE has supported a significant cluster of successful experiences in sustainable building across Europe

The environmental impact of buildings is high. Heating and lighting of buildings accounts for 50% of the industrialised world's energy consumption: twice as much as transport and agriculture/industry¹. In the UK, nearly half of all CO₂ emissions result from energy used in buildings. Construction takes up 40% of the total flow of raw materials into the global economy every year – some 3 billion tonnes.

LIFE has funded a number of sustainable building projects. These range from the realisation of demonstration techniques and demonstration buildings, to the development and promotion of innovative methods and tools for the construction industry. All projects had exposure across Europe.

¹ Green Futures May/June 2000

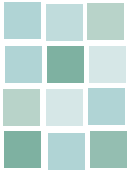
Figure 16. LIFE-Environment projects 1992-2004 on sustainable tourism by country

Head office of Johanneum Research in Graz, after renovation work.



Table 5.5: Sample of LIFE projects in sustainable building

Project Title	Country	Project Number
Multifunctional company and administration building with logistics and cultural centre in passive house standard in sustainable timber construction	A	LIFE02 ENV/A/000285
New services for the sustainable retrofitting of buildings	A	LIFE99 ENV/A/000392
Demonstration and dissemination project for stimulating architects and local governments to build sustainable with help of innovative design tools	NL	LIFE00 ENV/NL/000808



The renovation of municipal and private residential buildings is usually characterised by high cost pressure. Measures for quality-assurance in the planning and implementation, as well as considerations of ecological aspects when selecting a contractor are usually neglected in order to keep costs as low as possible. In recent years, the City of Graz, Austria, has laid the foundations for a renovation campaign that placed high importance on ecological considerations. The successful LIFE project has paved the way for a wider campaign for the ecological renovation of buildings.

*Kappelerstraße in Graz,
after renovation work.*



LIFE example: successful, sustainable building (1) “New services for the sustainable retrofitting of buildings”

The main goal of the project was to develop a services market for the ecological renovation of buildings. This included the following tasks:

1. Creation of model projects for the sustainable renovation of three municipal blocks of flats.
2. Development of a market for qualitative appraisal of services of local firms specialising in sustainable renovation. The agency would establish and coordinate a network of service providers with controlled standards of services.
3. Establishing information and marketing programme aimed at building societies, owners of blocks of flats and other municipalities in order to stimulate demand.

When the project terminated, the energy-related and ecological renovation of 74 residential buildings was successfully completed. Some 20 buildings were completely renovated. As a result of this initiative, the renovation of the Daungasse, Asperngasse and Wagner-Biro-Straße residential estates in Graz was awarded the “Energieprofi” 2001 prize by the Austrian minister of the environment and the Austrian Society for Environment and Technology.

The environmental and economic benefits related to the pilot project included reductions of:

- > energy consumption by 100-400 MWh per year
- > heating costs by more than EUR 10,000 per year
- > emissions of greenhouse gases

Moreover, as a result of a series of workshops and seminars, 21 companies – from the building trade, engineering offices, installation companies, joiners workshops etc. – actively participated in setting up the “Ecological building renovation” network. The objective of the platform was to establish a new market for companies and to develop quality criteria for ecological services. This platform was integrated in another, active platform that is available at:
<http://www.ecoundco.at/>.

Following the project’s termination in 2002, a further study was carried out by the LIFE monitoring team in June 2004. This showed the criteria established for the assessment tool were still in use in the form of checklists. The beneficiary is continuing to enhance the concepts applied to this renovation, for other buildings. Several projects have started, thanks to contacts established during the LIFE project. These include a project in Kapellerstraße, Graz (which consists of two blocks with around 60 apartments) and an administrative building, the head-office of Johanneum Research, Graz.

Significantly, the project demonstrated energy savings of at least 2,000 MWh heating energy and 316 tonnes CO₂ per year could be achieved. This means the original goals have been exceeded five-fold in both categories.

Project Number:
LIFE99 ENV/A/000392
Beneficiary: Grazer Energieagentur
(Energy Agency of Graz)
Total eligible cost: EUR 494,175.27
EC Contribution: EUR 247,087.64
Period: 15-Oct-1999 to 14-Apr-2002

Another example is the demonstration project "Extensive Roof Greening" in Sweden, which tested the viability and environmental benefits of 'green' roofs.

Industrial 'green roofing' at Augustenborg's Botanical Roof Garden

LIFE Example: successful sustainable building (2)

"Extensive roof greening"

As large cities spread, green areas are being reduced in size and in number. One response to this has been to consider roofs as locations for gardens, though these can require a high level of maintenance. An alternative to this is the so-called 'extensive green roof', which has a growing medium of 150 millimetres or shallower. The availability of thinner and lighter earth layers has made it possible to green larger roof areas, such as on industrial buildings.

The Swedish project examined this issue, with the objective of seeing the technique more widely adopted throughout Scandinavia. The project involved the greening of 9,500 m² of industrial roofing using different layers and types of growing medium. This would allow monitoring and academic study. From an energy conservation viewpoint, green roofs offer the dual benefit of improved insulation and a natural cooling effect from evaporation and transpiration.

The project demonstrated a number of promising results:

- > Green roofs ensure considerable reduction of storm water run-off; 60 percent of annual precipitation is absorbed by the green roof and returned to the atmosphere through evaporation.
- > Energy savings through more efficient heating are significant; building energy consumption is reduced through improvement of the roof's thermal insulation and provision of active summer cooling through evaporation and transpiration.
- > Green roofs can increase biodiversity in urban areas and help reduce noise; botanical roof gardens are of both national and international interest.
- > Roof greening extends the life of the roof, offering savings in terms of maintenance and replacement.

The project was also successful in terms of the interest it attracted. The Visitors' Centre remained open after the end of the project, and the green roof area of 9500 m² is expected to last for several decades. A number of postgraduate students and doctoral researchers have based research papers on the green roofing topic, in connection with the project. The project website, published in seven languages, remains open at: <http://www.greenroof.se/>

Project Number:

LIFE98 ENV/S/000482

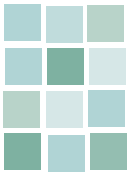
Beneficiary: Malmö Stad Serviceförvaltningen

Total eligible cost: EUR 1,393,675.80

EC Contribution: EUR 519,586.32

Period: 01-Sep-1998 to 01-Mar-2003





To conclude therefore, the previous sections have hopefully provided a clear indication of the way LIFE-Environment projects helped steer innovation of products and services in Europe between 1992 and 2004. "What field are we in?" examines the background to EU policy in this area, within the context of the 6th EAP, and highlights the Commission's new strategy on sustainable use of natural resources, due later in 2005. Key facts and figures on the use of natural resources are also identified. The question "How was the LIFE funding allocated?" is answered by tables and figures outlining the distribution of funding and number of projects for the four generic sub-themes identified from the LIFE database of projects. The question "What were the main impacts of the LIFE programme?" is answered by six key messages – supported by a wide range of successful projects from different Member States – demonstrating innovative techniques to reduce the environmental impact of products and services throughout their lifecycles.

4. Looking ahead: LIFE-Environment in 2005 and onwards ...

As mentioned in the beginning of this section, the third assessment of Europe's environment shows that material use is still high, at levels that were recognised as unsustainable in Rio. Integrated Product Policy is a policy that addresses the environmental impacts of material use: it aims to reduce the environmental impact including the way in which resources are used, of products and services throughout their lifecycles.

Looking to the near future therefore, as laid down in the LIFE-Environment application guide 2005, the LIFE programme will therefore finance innovative projects aimed at the "reducing the environmental impact of products and services".

The priorities are as follows:

- > Environmental design of products and services
 - Reduction of the environmental impacts throughout the life-cycle of products or groups of products through innovative design (e.g. through ISO Type I labelling instruments) and improvement of the information flow within the supply-chain (e.g. through ISO Type III labelling).
- > Reducing environmental impacts during the use phase of products and services
 - Promotion of green consumption patterns regarding products and services that have a significant overall environmental impact due to their widespread usage or their inherent characteristics.



© Pierre Fauvelle

A 'living' rooftop insulates against summer heat and winter cold.

LIFE-Environment horizontal issues

In the previous chapter we examined the way the LIFE-Environment programme has supported a wide range of successful projects across five thematic sections. In this chapter, we provide a broader analysis of the LIFE-Environment programme, by examining its impact across a range of 'horizontal' issues.



© Antwerp Port Authority

Pilot project at the Port of Antwerp for the removal of TBT pollutants.

Introduction

In section 5.1, we examine the growing evidence that LIFE-Environment is acknowledged as a programme of international excellence. This section is accompanied by a sample of just a few of the many successful LIFE projects that have been awarded over the past 12 years.

In section 5.2, we look closely at a number of outstanding LIFE projects that were considered successful when they closed, but which have gone on to generate significant income for their beneficiaries, or to generate considerable environmental savings or income for society at large – win-win projects.

In section 5.3, we look at the importance of the innovative aspect of the LIFE-Environment programme: this demonstration phase does not attract investors and LIFE plays a crucial role here in supporting innovative environmental ideas, at the right time, so that they are able to go on and become successful.

In section 5.4, we look at the evidence that LIFE-Environment created long-lasting local successes of environmental projects – examining in detail one highly successful community-based integrated coastal zone management project.

Finally, in section 5.5, we look at the importance of communication to the LIFE-Environment programme and examine evidence of good dissemination of project results.



5.1: LIFE is acknowledged as a programme of international excellence

More than 1,400 projects in the Member States and neighbouring countries now participate in, or have participated in, the LIFE-Environment programme. They have accumulated a tremendous wealth of experience and knowledge that contributes directly, or indirectly to the improvement of our environment.

LIFE is acknowledged as a programme of international excellence. This is shown, firstly, by the strength of its main dissemination tool, the LIFE website, which is now achieving over 200,000 hits per month. Visits to the website have grown consistently over the past three years, with the traffic increasing from 123,194 hits in September 2001 (peak time due to the opening of the calls for proposals) to 218,254 in November 2004 (peak time for that year). Coupled with this is the LIFE programme online database, receiving over 50,000 hits per month. The database, supported by its powerful search capabilities, offers world-wide, free, instant access to LIFE programme project details.

Secondly, many LIFE-Environment projects have been recognised both nationally, and internationally, by industry sector or other environmental and product innovation awards and prizes. These have helped to boost the reputation of the programme for excellence both within Europe and elsewhere.

Thirdly, the reputation of the programme has spread world-wide among researchers, stakeholders, governments and NGOs, and its experiences are now being replicated. For example in a 2003 publication¹, the American Environmental Protection Agency says state and local governments in the U.S are "strategically harvesting" environmental policies and best practices – including the EU's LIFE-Environment programme – from overseas. Significantly, EPA representatives recently visited the European Commission in Brussels,



Pioneering low-emission shipping: the new LNG (Liquefied Natural Gas) tanker.

to learn more about the LIFE-Environment programme - with a view to setting up a similar scheme in the U.S.

Fourthly, another indicator of the success of the programme is the fact that less than 25% of project proposals are selected for co-funding (through the available annual budget). And, as a result of the programme's rigorous selection procedure, only the best proposals are accepted. The programme is also well-managed and the costs for the LIFE Unit managing the projects are limited, compared with other EU programmes.

An independent evaluation of the LIFE programme was carried out in 2003 by AEA Technology plc (AEAT). The evaluation concentrated on LIFE II, as when it was carried out few LIFE III projects had been completed. AEAT found that in general, the LIFE programme was efficiently managed and controlled using systematic and rigorous procedures that have been introduced by the LIFE Unit... A number of stakeholders both in the Commission and the Member States commented on the excellent professionalism and high workload of the LIFE Unit.

There were some criticisms; however, including a call for greater transparency in the project selection process and for improved dissemination of project results. These have been addressed under LIFE III onwards, so that today,

a strong and relevant dissemination of project progress and results (and more recently, by follow-up 'ex-post' evaluation reports after closure) is an essential part of the programme. Projects are closely monitored throughout the project period, to ensure that the objectives are effectively achieved. In addition, a new 'Scoring Sheet' system has recently been introduced to aid assessment of projects at closure, and to help identify the best projects. When a project is officially closed, it will be judged on a score of between 0-100 on: 1 environmental benefit 2 long-term sustainability 3 demonstration, transfer and cooperation and 4 innovation. Projects scoring over 80% will be judged "very good" and will be automatically eligible for selection by Member States, in the year's top 25 projects.

¹ "International Best Practices and Innovation: Strategically Harvesting Environmental Lessons from Abroad" in *ECOSTates, Winter (2003): 14-18* by Medearis, Dale, Brian Swett, and Merrylin Zaw-Mon is available from the EPA's International Urban best Practices website at : <http://www.epa.gov/oia/urban/index.html/>

1. Strength of LIFE website & database enhances international reputation for excellence

LIFE website

It is important to make the best possible use of the results of the LIFE-Environment projects, even after their completion. To do this the LIFE Unit has developed a powerful instrument – the LIFE-Environment website and its accompanying, fully-searchable database of projects 1992-2004. The database is the most authoritative and up-to-date source of information about LIFE projects and the best practices they have developed, or are developing.

The website is a portal for users seeking information on LIFE. The information provided addresses the Lisbon and Gothenburg² goals of achieving the most competitive knowledge-based economy world-wide, helping to:

- > create knowledge;
- > disseminate/share knowledge;
- > acquire use/apply knowledge; and
- > evaluate knowledge

Key features of the LIFE website:

1. Regularly updated website: bringing latest news, events, announcements, publications and funding details of the LIFE programme.
2. Accessibility: Information is easily accessed by all. The website is user-friendly, easily-navigated and well-structured.
3. High-quality: LIFE-Environment data focuses on access to European funding, news of events, partner search facilities, practical help with establishing project proposals, plus analytical publications covering specific areas, e.g., Air, Waste, Water brochures.
4. Branding: (via the well-recognized LIFE logo).
5. Exchange of knowledge and information: between researchers, industry stakeholders, NGOs, government departments etc.

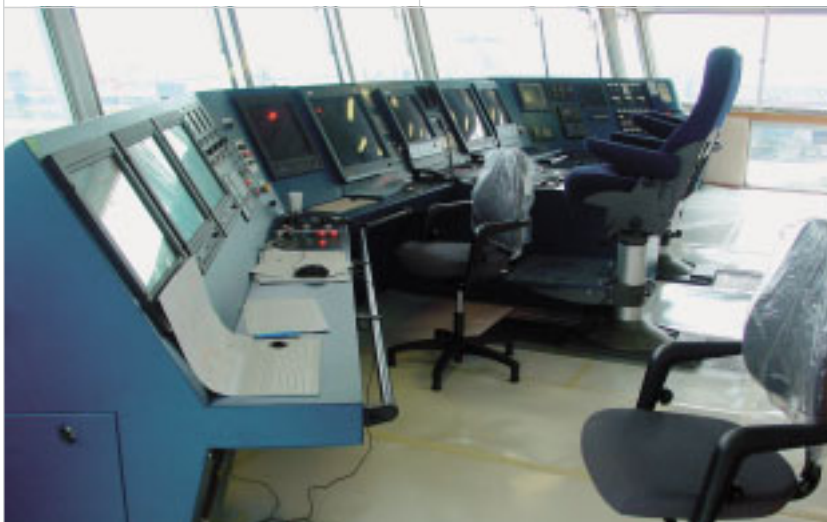
LIFE projects database

Linked to a powerful search engine, the database has been continuously developed and updated and provides full-searchable details of LIFE co-funded projects in the EU and neighbouring countries. Search options have been progressively made more sophisticated, so that projects can now be searched by theme, country, field of interest, keyword, etc.

Key features of LIFE database:

1. It is a 'one-stop shop' for all EU co-funded LIFE-Environment demonstration and preparatory projects.
2. Results of completed projects are published online in 'web summaries' outlining project background, objectives and results.
3. Provides useful, back-up material e.g., references including project websites and additional, "layman's reports" – further explanatory and technical data produced by the project beneficiaries.
4. A tool for cooperation and coordination between different stakeholders in the knowledge-value chain

² The Gothenburg European Council (15-16 June 2001) added an environmental dimension to the Lisbon Process on economic renewal launched in June 2000 and agreed on a strategy for sustainable development on the basis of the proposals made in the Commission Communication "A Sustainable Europe for a Better World" /* COM/2001/0264 final */.



Environmental benefits of the new LNG tanker include reduced CO₂ and NO_x.



2. LIFE projects awarded: evidence of international excellence

A host of LIFE Environment projects have received product innovation or environmental awards in their respective industry sectors. These accolades have boosted the reputation for excellence of the LIFE programme both nationally and internationally.

A noteworthy example is LIFE99 ENV/IRL/000605 one of 12 finalists in the prestigious **European Awards for the Environment 2004**. These awards, announced at Green Week in February 2004, recognize 'outstanding contributions to sustainable development'. Chemicals company and LIFE beneficiary, Cognis Ireland Ltd, was nominated in category 3: the 'process award for sustainable development' for the distillation of processed toluene with energy recovery. More recently, the company won the 2004 European Solvents Stewardship Awards, by the European Solvents Industry Group (ESIG), in the 'environmental improvements' category.

The company manufactures speciality chemicals used in the extraction of non-ferrous metals. A key element in the manufacturing process involves the use of large quantities of toluene as a reaction solvent. Through the LIFE co-funded research and development programme, Cognis identified the possibility of distilling the processed toluene rather than washing it, thus reducing the environmental impact of the process. Additionally, the company identified the possibility of recovering the distillation residues as a supplementary fuel through its 'waste to energy' plant. The nominated project is a valuable demonstration of integrated pollution control in the chemicals industry and its results have been widely disseminated. It has also demonstrated the cost/benefit advantages of cleaner technologies, which should demonstrate to the wider EU chemicals industry that it is possible to adopt environmental improvements while enhancing industrial competitiveness.

Another example is LIFE02 ENV/H/000435 whereby beneficiary, Budapest-based SME KÖRTE-ORGANICA Környezettechnológiák Rt., was awarded Hungary's **Pro-Environmental Protection 2003** prize in recognition of its environmentally-friendly achievements in the field of spent steep solution reprocessing and the establishment of its spent acidic steep solution processing plant.

As a result of the award-winning technology for processing the exhausted hydrochloric pickling solution with exhausted metal content, over 2,000 tons of calcium chloride, originating annually in the course of alkaline neutralisation of acidic steep solutions, no longer end up in the rivers of Hungary. Furthermore, the country is freed from the final placement of 4,800 tons of metal hydroxide (of 35% dry material content) in sludge waste deposits. The developed technology also allows a significant reduction of the imported iron (III) chloride produced from ferrous metal and chlorohydric acid.

A third example concerns a recently-closed project in the Netherlands, LIFE03 ENV/NL/000474, finalists in the **Clean Marine Award 2004**, a new award to recognize best practices in low-emission shipping in the EU. Beneficiary, the Bijlsma Shipyard (& Knutsen), were nominated for their unique new Liquified Natural Gas (LNG) tanker with two engines, one running on its own LNG cargo, the other on diesel.

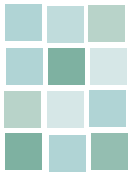
The environmental benefits of the LNG engine include: a significant reduction in the emissions of CO₂ and NO_x; reduced noise and vibration and lower costs than diesel or heavy oil. Although these engines already exist in industry - (LNG turbines) and land transport with a minimum range (e.g. city buses) – they had not previously been used for medium and small-sized cargo vessels.



Award-winning chemicals company, Cognis Ireland Ltd.

Project Number	Project Title	Type of Award
LIFE03 ENV/D/000031	Oil-Porous-Burner system with integrated vaporizer unit	Awarded Deutschen Gründerpreises 2004 – German Prize awarded to start-ups.
LIFE03 ENV/NL/000474	LNG Tanker, Demonstrating the effective and safe use of liquid natural gas as fuel for ship engines for short-sea shipping and inland waterway transport	Nominated in the inaugural Clean Marine Awards 2004 - 'EU ship operator with low-emission operation beyond regulatory requirements' category.
LIFE02 ENV/D/000399	Environmentally optimised rainwater management systems in the field of municipal wastewater management	Included in 'Top 100 – Exceptional Innovators of German SMEs' and 4th place in the category 'innovation-driving top management'.
LIFE02 ENV/IT/000064	PVTRAIN: The application of innovative photovoltaic technology to the railway trains	Trenitalia, the beneficiary was awarded the "Gianfranco Merli" national prize for the environment on 16 December 2002 by the national association for environmental protection, Movimento Azzurro, on the following grounds: "for the importance of the initiative of installing solar panels onto trains and giving the public correct and adequate information; a general incentive to a greater and more practical commitment for the environment."
LIFE02 ENV/H/000435	Utilisation of exhausted metallurgical pickling acids qualified as hazardous waste	Pro Environmental Protection 2003 - Association of Environmental Enterprises (Hungary).
LIFE99 ENV/IRL/000605	Environmental Sustainability through solvent and energy recovery technologies	1. Finalist in European Awards for the Environment 2004 – 'process award for sustainable development' category. 2. Winner of the 2004 European Solvents Stewardship Awards.
LIFE99 ENV/NL/000232	Paperfoam: demonstration of the applicability of an innovative technology to produce packaging, made of natural fibres and starch, which are both environmentally friendly and of a high quality	1. 2000 and 2003 WPO Worldstar award in the consumer electronics category. 2. 1st place in the Deutscher Verpackungswettbewerb 2000 - German packaging contest. 3. The International Packaging Industry Award 2000 in the UK Environmental design category. 4. 2nd prize in the Dutch Gouden Noot packaging awards. 5. UK Starpack Award 2003 for Consumer Family (classification: Gold). 6. Ameristar 2003. Also received the International DIN-CERTO certificate; and OWS (Organic Waste Systems) certificate.
LIFE99 ENV/DK/000614	Super critical wood impregnation	EU environmental award - "clean-technologies" category (Denmark) 2002).
LIFE99 ENV/NL/000233	The RESPECT project: Re-use of Second-hand car components in Company car fleets	Winner of the Netherlands Environmental Innovation Award 2001 (Ei van Columbus) in the category 'service providing organisations'.
LIFE99 ENV/A/000392	New services for the sustainable retrofitting of buildings	Awarded the "Energieprofi" 2001 by the Austrian minister of the environment and the Austrian Society for Environment and Technology.

TABLE 6: Sample of LIFE projects that have won awards 1992-2004



Project Number	Project Title	Type of Award
LIFE98 ENV/E/000454	Project for implication of social and economic partners in the sustainable and multi-functional management of forests	1st prize in Local Sustainability Initiatives Awards promoted by the Environment Dept, Catalonia, Spain.
LIFE97 ENV/IRL/000209	The Development of a consensus Based Integrated Coastal Zone Management Strategy for Bantry Bay.	National Planning Achievement Award 2000 - Irish Planning Institute.
LIFE97 ENV/F/000188	ECOLIZ - Prevention of animal dejections related pollutions.	INNOV'SPACE 98 'distinction' at SPACE exhibition, Rennes (France).
LIFE95 ENV/F/000532	Manufacturing expanded glass sand from glass waste	Winner of European award for inventions 1996.
LIFE94 ENV/NL/001380	Demonstration of an innovative management concept focussed on the re-use of parts and material of used toner cartridges.	Winner of European Environmental Industry Award 1995 (EC, DG XI).
LIFE93 ENV/NL/003504	Clean strip technology for aircraft motorparts through ultra high pressure waterblasting.	Clean Technology Award - ministry for environmental management (the Netherlands)

TABLE 6: Sample of LIFE projects that have won awards 1992-2004 (continued)

[Source: LIFE projects database]

3. US acknowledges LIFE programme as evidence of International Best Practice

In a 2003 publication entitled: "International Best Practices and Innovation - Strategically Harvesting Environmental Lessons from Abroad"³ the American Environmental Protection Agency (EPA) acknowledges state and local governments in the U.S. can learn a good deal from the environmental policies and best practices from overseas. It urges its local authorities to « look globally for best practices and successful innovation » and cites among others, the LIFE-Environment programme – « with its extensive libraries of case studies and other information ».

The study identifies three key areas: Brownfields; Air; and Water where it says states and local governments are « poised to import innovative environmental lessons from Europe and elsewhere in order to address the most pressing environmental challenges in the U.S. ».

- > Brownfields – The study says development in Europe has been strengthened by the inclusion of international design competitions which often foster creation of 'green' buildings, redeveloped open-spaces and landscapes, and preservation of historic structures and buildings.
- > Air – The study says the cache of innovative smart growth policy tools common in many OECD-member countries also has preserved open space, supported urban forests, and created greenbelts around many cities – especially in Europe. "Greenspace planning in Stuttgart, Germany, and in Stockholm, Sweden, is linked into sophisticated networks of 'green' air corridors designed to mitigate the negative effects of urban heat islands and to reduce air pollutants."

- > Water – The study says EU-member and OECD-member countries have also demonstrated innovation in the realm of watershed management and water infrastructure. "In the 1950s, twenty years before the U.S., Germany was beginning to research the treatment and cost efficiencies of constructed wetlands and demonstrate how constructed wetlands could serve as a viable alternative to conventional water treatment processes. Moreover, UV treatment of drinking water, rather than chlorine, is commonly applied in France and Germany."

³ "International Best Practices and Innovation: Strategically Harvesting Environmental Lessons from Abroad" in *ECOSTates, Winter (2003): 14-18*. By Medearis, Dale, Brian Swett, and Merrylin Zaw-Mon. See EPA's International Urban Best Practices website at: www.epa.gov/oia/urban/index.html/.

Success Stories – Regional and Local Level

The report cites several examples of international partnerships and exchanges of information that have led to the adaptation in the U.S. of innovative programmes and practices at a regional and local level from overseas, notably the EU. For example, it cites among others, the Brown-fields redevelopment in Lawrence, Massachusetts and Bridgeport, Connecticut as having followed the UK (LIFE-Environment co-funded) Groundwork project: “**Toolkits for community-led regeneration of derelict land**” (LIFE99/ENV/UK/184). This project successfully implemented a range of ‘toolkits’ (technical information on a range of tested methodologies and best practices) in socially deprived areas to improve the quality of life of the local communities.

EPA visits LIFE Unit with view to establishing a similar programme in US

Finally, representatives of the EPA visited the European Commission in Brussels at the end of 2004, to learn more about the LIFE-Environment programme – with a view to setting up a similar scheme in the U.S. Following a meeting in December 2004 with representatives of the LIFE Unit, they visited a recently-completed Belgian LIFE project for the Port of Antwerp “**TBT-Clean**” (LIFE 02 ENV/B/0341). The project sought to provide an integrated solution for the permanent removal of the TBT pollutant from waterways near harbours and inland ship repair yards. Following the meeting, the EPA representatives expressed their appreciation of the presentation of the project outcomes and results and of the experiences from the viewpoint of a beneficiary of the LIFE programme.

LIFE example: “Development of an integrated approach for the removal of tributyltin (TBT) from waterways and harbours: prevention, treatment and re-use of TBT contaminated sediments”

Tributyltin (TBT) has been used in paints for ships since the 1970s. Its toxicity prevents the growth of algae, barnacles and other marine organisms on ships’ hulls. However, TBT leaches from the paint and enters the marine environment; it accumulates in the sediment, especially in areas with a number of ships such as harbours and ports. Moreover, from 1 January 2003, its use in so-called ‘anti-fouling’ paints on ships has been banned by Commission Directive (2002/62/EC) of 9 July 2002 on organostannic compounds.

The overall objective of this LIFE project was to provide an integrated solution for the permanent removal of TBT from waterways near harbours and inland ship repair yards. Specific objectives were to:

- > Assess the environmental impact of already available alternatives for TBT;
- > Evaluate the release of TBT from sediments into the aquatic environment during dredging operations;
- > Test on a pilot-scale several treatment technologies for TBT contaminated sediments including thermal, bioremediation and dumping;
- > Identify possibilities for the reuse of treated sediments.

The project closed in January 2005, with the following first results:

1. Cost-benefit analyses of the treatment techniques indicated:
 - Thermal treatment was the most efficient method, with 99% removal, but it was also the most costly;
 - The cheapest technique appeared to be bioremediation (lagooning, + nutrients and microorganisms), but with an efficiency of 70%;
 - Dumping was not the cheapest solution since it included dewatering, disposal and taxes.

2. The project also assessed the re-use possibilities of the sediments. (This analysis was based on ecotoxicity and human health criteria). One potential option was the re-use for civil works (e.g. back-fill material, dikes).

3. Recommendations for the Port of Antwerp, based on the information collected by the project included:

- Dredging should be avoided in summer (if pH and T° are too high) and use of techniques that limit turbidity;
- Costs of dredging influenced the choice of technology: the results indicated that it is sometimes necessary to find a compromise by using a quicker technique – that cannot avoid turbidity – but in a limited area.

The project has an informative website, published in English, which remains open at:

<http://www.portofantwerp.be/tbtclean>

Project Number:

LIFE02 ENV/B/000341

Beneficiary: Gemeentelijk Havenbedrijf Antwerpen (Antwerp Port Authority)

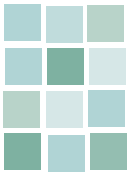
Total eligible cost: EUR 3,222,366.09

EC Contribution: EUR 1,335,495.00

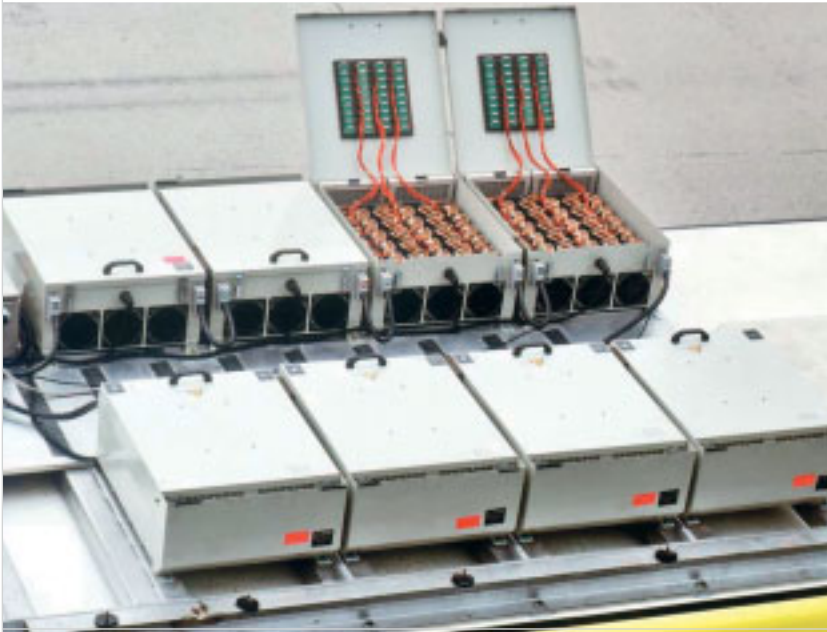
Period: 01-Oct-2002 to 01-Jan-2005

Dry docks at the Port of Antwerp.





5.2: LIFE created sustainable projects with both positive economic and environmental impacts



Close-up of UltraCap (ultracapacitors) from EPCOS, developed from the new LIFE co-funded Siemens technology. LIFE97 ENV/D/000474

A number of outstanding LIFE projects go one stage further than highlighting a new technological innovation in a specific thematic sector. They are also able to demonstrate that a particular innovation, treatment process or methodology can actually provide better value-for-money. In this section we will demonstrate how LIFE-ENV helped to create sustainable economic environmental 'win-win' projects.

1. LIFE reflects Lisbon goals and helps meet ETAP priorities

Such 'win win' projects reflect Lisbon goals: demonstrating a commitment to economic, social and environmental renewal in Europe, while at the same time contributing to a strategy to make the EU the world's most dynamic and competitive economy. Under this strategy, a stronger economy will drive job creation alongside environmental and social policies that ensure sustainable development and social inclusion.

These projects also support the strategy announced in the Commission's Communication on ETAP (Environmental Technologies Action Plan), published on 28 January 2004¹. This initiative focuses on actions to strengthen research into environmental technologies, supporting demonstration and replication of promising techniques. It highlights the need for more research efforts to be concentrated on the developing of new technologies addressing environmental issues, and to reduce the cost of environmentally-friendly technologies that are already available, but remain under-used.

The objective of ETAP in this field is to optimise the use of funds within the existing national and European research schemes, such as the Sixth RTD Research Framework Programme (2002-2006)². This programme is implemented on the basis of thematic research priorities that will link with ETAP where relevant. This is in particular the case for priorities such as 'sustainable development, global change and eco-systems'

(which includes environment, energy and transport); and 'knowledge-based multifunctional materials and new production processes and devices'. Other Community programmes, such as LIFE, can facilitate the demonstration of the technical and economical viability of new technologies. See the Table 7 for a selection of highly successful LIFE-Environment projects that contribute to these key ETAP and Lisbon priorities.

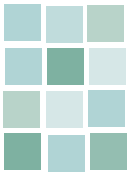
¹ COM/2004/0038 final
Communication from the Commission to the Council and the European Parliament - Stimulating Technologies for Sustainable Development: An Environmental Technologies Action Plan for the European Union

² Decision No 1513/2002/EC of the European Parliament and of the Council of 27 June 2002 concerning the Sixth Framework Programme of the European Community for research, technological development and demonstration activities, contributing to the creation of the European Research Area and to innovation (2002 to 2006) published in OJ on 29/08/2002

Project Number	Project Title	Type of Award
LIFE96 ENV/NL/000224	Total paste return in textile printing	The technology allows almost total recovery of "paste" in printing, with considerable cash benefits. It achieved a remarkable return on investment within one year, and also offers environmental benefits. The product is now exported worldwide.
LIFE96 ENV/DK/000012	Integrated cooperation on sustainable tourism development and recreational use in the Wadden Sea area	The project developed an action plan on the development of tourism in the framework of an existing partnership between three countries. The action plan was successfully implemented and continues to be used.
LIFE97 ENV/D/000474	Construction of a demonstration flywheel energy-storage system for the reduction of the energy-consumption in public light-rail systems by up to 10%	Beneficiary Siemens developed this application for light public transport systems of a technology allowing for the recovery of braking energy, which is usually lost as heat. While the technology proved impractical for its original purpose, the company was able to use it to develop a completely new concept for energy storage. It is a good example of a 'competitive' and innovative project.
LIFE98 ENV/D/000500	Environmentally friendly production of rechargeable long-lasting lithium-ion button cells	This type of battery has a number of environmental benefits. LIFE helped finance the large-scale production of this type of battery. This is an excellent example of innovation and improved competitiveness.
LIFE99 ENV/NL/000232	Paperfoam: demonstration of the applicability of an innovative technology to produce packaging, made of natural fibres and starch, which are both environmental friendly and of a high quality	This is an example of an innovative, competitive and environmentally-friendly product. LIFE helped finance the development of the technology for the production of Paperfoam, based solely on renewable sources. It has also won several international packaging awards and several international licences have been sold.
LIFE99 ENV/IT/000034	Use and ...re-use. The 'processing centre' in the logistics of packaging of fresh fruit and vegetable products	The project developed an innovative system for avoiding the waste from millions of tonnes of packaging generated annually in Italy, from the transportation of fruit and vegetables. It has achieved spectacular economic/environmental savings and, following completion, continues to grow from strength to strength. The scheme now looks set to be replicated in other European countries.

Table 7: Sample of LIFE 'win win' projects 1996-2004

[Source: LIFE projects database]

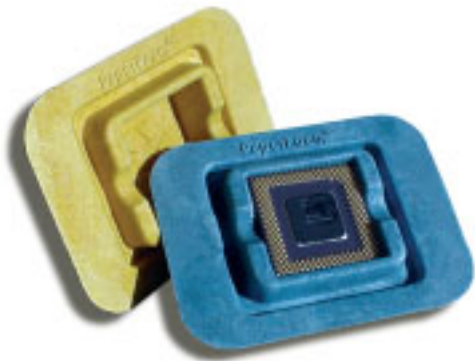


2. A number of successful LIFE projects have gone on to generate significant income/environmental savings

As the Table 7 illustrates, a number of LIFE-Environment projects were considered successful when they closed. Many of these projects have gone on to generate significant income for their beneficiaries or to generate considerable environmental savings or income for society at large. With the aid of a series of ex-post evaluations carried out by the LIFE monitoring team in 2004 and early 2005, together with the participation of the beneficiaries, LIFE is able to assess many of these 'win win' projects' subsequent evolution.

A particularly noteworthy example is the PaperFoam packaging project in the Netherlands. Here co-funding from the LIFE programme enabled the company to develop innovative technology for its packaging. As a result, the company has obtained a number of environmental certificates (the products are biodegradable). It has also been awarded several awards in the packaging sector. And, significantly, the company's targets for profitability are set to be reached in the third quarter of 2005 – two years earlier than originally forecast.

Using innovative inner packaging by PaperFoam® brand image is magnified through shape, embossing and colours.



LIFE example: economic environmental 'win win' projects (1) "Demonstration of the applicability of an innovative technology to produce packaging made of natural fibres and starch that are both environmentally-friendly and of a high quality"

In 1998 Vertis B.V., the beneficiary and holding company of PaperFoam BV, was looking for additional start-up capital. Venture capital firms and banks were not interested in providing such capital. LIFE then appeared as an excellent funding opportunity for PaperFoam, since this was an environmental demonstration programme at the international level - exactly the level then required for further development of PaperFoam.

PaperFoam is based solely on renewable resources such as starch, natural fibre and water. After use, the material can be recycled with paper. It is biodegradable and it can be burned without damaging the environment. The PaperFoam technology is particularly suited to the production of low-quantity, high-quality packaging applications.

The aim of the project was to build and operate a demonstration plant to show the market that, having drawn up the specifications, using this technology in combination with design tools (CAD/CAM) it was possible to have a continuous production process for all conceivable types of packaging.

When the project closed in August 2001, the results were better than expected:

1. Thanks to the demonstration project carried out within the framework of the LIFE programme, the beneficiary generated orders from five international companies (Bosch, Siemens, Packard, Detewe and Ascom).
2. The amount of interest generated in the product and the technology was huge. Since October 1999, PaperFoam technology has been used to pack the Tenovis (former Bosch Telecom) line of desktop phones. This application has received several international packaging awards.
3. In terms of job creation, this was also much higher than expected: by early 2003 about 30 people were working for PaperFoam.

During the project period PaperFoam also obtained two certificates declaring that all PaperFoam products have a low environmental load and that they are biological degradable. The first is the international DIN-CERTO certificate; the other is a certificate of OWS (Organic Waste Systems).

At the end of the project, the financial figures also exceeded expectations. Depending on the scale of production and demand for PaperFoam packaging, this investment could be earned back in 7 years. The profit after 7 years was forecast to be between EUR 1.4 and EUR 4.5 million.

An ex-post evaluation carried out by the LIFE monitoring team in July 2004, showed PaperFoam has continued to flourish: It has sold 4 licences, one in Malaysia (Penang) and one in Denmark (Torrington), one in China (Beijing) and the US (Dallas). To date, there are approximately 45 machines worldwide of which 30 are licensees. Since the end of the LIFE project, PaperFoam has also obtained several new customers such as Motorola, Axis, Stabilo, Iomega, SON-ICblue/Rio. In addition, PaperFoam has won several new awards including the UK Starpack Award 2003 for Consumer Family (classification: Gold), the Ameristar 2003 and the reputed Worldstar 2003 award (in the category 'electronics')

Finally, the financial results are also a crucial indicator for the sustainability of the technology and initiative. Here too, PaperFoam did well. The target for turnover for the 2004 fiscal year looks set to be met. The previous fiscal year also showed strong progress. Moreover, PaperFoam expects to make its first profits in the Q3 of 2005.

Project Number: LIFE99 ENV/NL/000232
Beneficiary: Vertis B.V.
Total eligible cost: EUR 1,608,448.93
EC Contribution: EUR 358,040.08
Period: 01-Feb-1999 to 01-Aug-2001



Processing centre for the packaging of fresh fruit in the city of Ferrara, Italy.

In another successful economic environmental 'win win' project, an Italian consortium of fruit and vegetable producers developed an innovative system for avoiding the waste from tonnes of packaging. This project successfully met its objectives at closure in May 2002. Moreover, a subsequent follow-up ex-post evaluation, carried out in 2004, showed continued, sustained growth – with an estimated reduction in waste of at least 50,000 tonnes annually and cost savings for waste treatment and disposal of around EUR 6.5 million.

LIFE example: economic environmental 'win win' projects (2) "Use and ... re-use. The 'processing centre' in the logistics of packaging of fresh fruit and vegetable products"

Each year, Europe produces approximately seven million tonnes of waste generated by packaging for transporting fruit and vegetables. This means mountains of crates, plastic, boxes, trays etc., are generated, with a disposal cost of an estimated EUR 0.09 per kilo, or EUR 630 million per year. There are two main reasons for the large amounts of waste and high disposal costs in this sector. First of all, the packaging material varies considerably in composition. And secondly, most of the packaging material is produced to be thrown away.

In Italy, which produces some 2.5 million tonnes of this packaging waste annually, a group of fruit and vegetable producers formed a consortium to find a solution to this growing problem, which was also resulting in higher costs for consumers.

The consortium developed the "CPR System" to tackle this packaging waste problem. Firstly, it produced special recyclable boxes, which could be folded and re-used for up to 30 round-trip journeys. Secondly, it set up "processing centres" in Italy and throughout Europe, for the re-use, sanitation and recycling of the boxes. Thirdly, it developed a computer network to systematically track the movement of the boxes at all stages.

The consortium purchases the special boxes and then rents them to the participants in the scheme. The empty boxes are then filled by the fruit and vegetable producers, and delivered to retail markets. After use, the market operators send the empty boxes back to the producers, and when the boxes become dirty from repeated use, the producers send them to the processing centres for cleaning and recycling.

When the project opened, there were 47 stakeholders. By the close of the project, this number had increased to 355, with over 30 million boxes in circulation. Each box was re-used on approximately 30 round-trips and the packaging waste was reduced dramatically.

The project achieved all its objectives:

- > Packaging waste reduction almost equal to zero, using re-usable and recycling boxes: in fact the boxes are completely recyclable and are used as raw material for new boxes;
- > Relevant cost reduction of the boxes movements: the costs is equal to about a half in comparison with the "one-use" boxes or "rental boxes";
- > Final price of fruits and vegetables showed average reduction of prices of 6 – 12%.

A further study, carried out by the beneficiary in April 2004, produced the following impressive results:

- > The number of participants in the scheme had jumped to 550 at the end of 2003, with around 50 million boxes in circulation at the end of 2004. This is forecast to reach 60 million in 2005. This meant a waste reduction in 2003, equivalent to around 50,000 tonnes (1 kg per box) and a reduction in costs for waste treatment and disposal of around EUR 6.5 million;
- > A market survey carried out in 2003 by the University of Bologna on prices of citrus fruits, fruits and vegetables in Bologna, Florence, Milan and Rome confirmed a price reduction of at least 10%, depending on the season.

Following the project's results, international reproduction of the project has begun with some tests being undertaken with three Spanish companies, suppliers of CONAD – a large Italian distribution company – which in 2003 managed 121,000 boxes.

Project Number:

LIFE99 ENV/IT/000034

Beneficiary: CPR System

Total eligible cost: EUR 1,486,362.96

EC Contribution: EUR 610,322.94

Period: 25-Nov-1999 to 25-May-2002



Finally, a third outstanding example is provided by the German project (LIFE97 ENV/D/000474), by world-wide technologies group Siemens. Here innovative flywheel technology developed thanks to LIFE co-funding for one application, which, though it proved impractical in its first development, was adapted and reintroduced successfully for a more reliable application.

"Hybridbus": a diesel-electric city bus with innovative energy-saving braking. UltraCap (ultracapacitors) from EPCOS are used to store the electrical energy generated by braking.



LIFE example: economic environmental 'win win' projects (3) "Construction of a demonstration flywheel energy-storage system for the reduction of the energy-consumption in public light-rail systems by up to 10%"

World-wide technologies group Siemens initially developed this application for light public transport systems. The new technology allows for the recovery of braking energy, which is usually lost as heat. As a result of implementing this rotating energy storage system energy savings of up to 30% were measured (exceeding the forecast 10% saving).

Unfortunately, the originally chosen mechanical flywheel technology proved not mature enough for the tough conditions in the railway system. However, lessons were learned from this first experience in terms of reliability and operational costs, and follow-up work was able to address these obstacles. The successful technology could not be applied to the LIFE project, which closed in March 2000, as the requirement for development of the new capacitors couldn't have been foreseen in the preparatory phase of the project.

As a result, a completely new concept for energy storage was chosen: and the prototype installation of this second generation storage system was installed at the substation Cologne Ensen, which had been also the site of the flywheel energy tests. Based on the experience with the new prototype, Siemens continued developing the energy storage technology, using double-layer capacitors

(DLC) as storage media. This is an innovative component based on electrostatic energy storage

In February 2001, the world's first energy storage system equipped with double-layer capacitors was installed in the Brueck substation of the Cologne transport company. Double-layer capacitors are the most innovative energy storage technology at extremely high power cycling capability. The small voltage of the individual capacitor cells is adapted to any traction system voltage by series connection and paralleling of the capacitors. First measurements and operational results realized at the DLC storage system showed the reachable energy saving potential was visibly higher than with the prototype of the first generation in Cologne Ensen. Therefore, the group concluded that the economic and environmental advantages have proven to be much better than with the flywheel system.

In a recent follow-up questionnaire Siemens reported that the second generation of its storage system, with supercapacitors, was already installed at five sites - in Germany, Spain, and in the US, and five further installations were planned for the near future. The company concluded that the "added-value of the LIFE programme" provided the opportunity to realise a prototype for a new technology that included many technical risks. The development of the storage technology for railway application would have been a long-term development over many years under normal R&D development: "The LIFE project provided the opportunity for quicker progress and partially covered the potential technical risks."

Project Number: LIFE97 ENV/D/000474
Beneficiary: Siemens AG-VT 349
Total eligible cost: EUR 971,414.84
EC Contribution: EUR 187,431.94
Period: 01-Jul-1997 to 31-Mar-2000

5.3: LIFE provides financial support at the right moment in the innovation chain

LIFE is above all a financial instrument that fills a gap in the innovation chain, where the public and private sectors are often absent. R&D projects are usually followed by a real-scale demonstration phase, which if successful, will then attract investors for the marketing phase.

1. Financing is the obstacle to innovation most often quoted by firms.

Bringing new environmental technologies to market can be a long and challenging process. Traditionally, early research has been supported by organisations with the resources to underwrite the risk of exploration (industry, academic institutions, government bodies, etc.). Once projects reach a sufficient stage of readiness, the private sector usually steps in with the financing and expertise to bridge the gap between development and the market, and therefore eventual commercial success.

But between R&D and market launch lie the critical stages of development and demonstration, taking technologies out of the laboratory and proving them in full-scale, real-world test situations. If this stage is under-supported, a gap in the innovation chain is created - even the most promising idea can fail, forcing entrepreneurs to abandon their efforts.

Innovation has an unpredictable nature and therefore project promoters find obtaining funding for these types of projects difficult. These difficulties are further exacerbated by:

- > The intangible component of innovative ideas, which increases the disparity between the guarantees demanded by investors for risk projects and the ability of firms to base these guarantees on solid foundations.

- > The globalisation and deregulation of financial markets can lead to better financing conditions. However, holders of funds also have a wider choice of candidates for investment. This not only exerts continued pressure on interest rates, but favours short-term, high-return investments to the detriment of longer-term risks, doubly penalising innovative SMEs

Venture capital is one form of innovation financing open to companies. In general, however, SME surveys show that the European innovation financing system is flawed for a number of reasons, such as:

- > A neglect of innovation on the part of institutional investors holding long-term savings (retirement funds and pension funds).
- > Less tendency for individual investors ('business angels') to consider companies not listed on a stock exchange
- > The major commercial banks in most countries are reluctant to get involved in innovation financing.

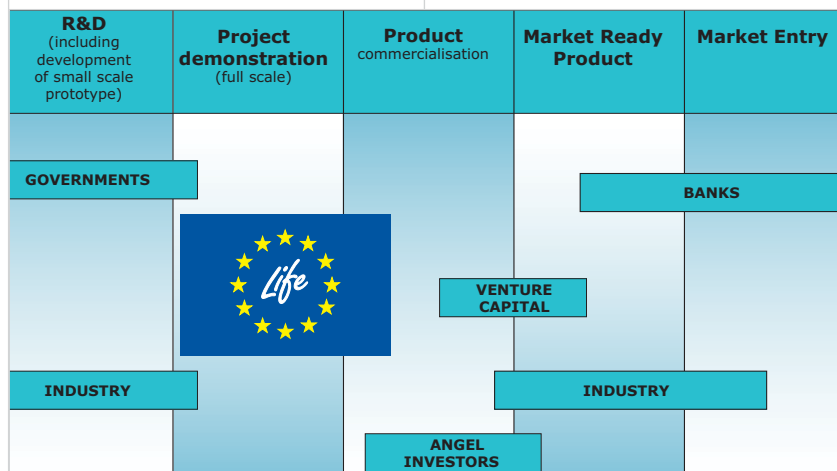
The European Commission has clearly identified – first in the 1993 White Paper on Growth, Competitiveness and Employment¹, and then in its 1994 Communication on An Industrial Competitiveness Policy for the European Union² – that firms' capacity for innovation, and support for it from the authorities, were essential for maintaining and strengthening competitiveness and employment.

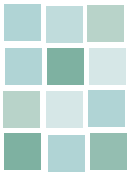
There are multiple players in the innovation chain, with varying degrees of influence and activity. The primary players at the idea-generation and concept development stage (fundamental and applied research, in Fig.17) are the universities and colleges (whose major sources of funding are from governments), and industry-based research and development labs. As the technology progresses from bench-scale tests to larger-scale prototype tests and demonstration, funding becomes less certain.

¹ "White Paper on Growth, Competitiveness and Employment" COM(93)700.

² "An Industrial Competitiveness Policy for the EU" COM(94)319 final.

Figure 17. LIFE-Environment in the innovation Funding Chain.





2. LIFE-Environment supports innovative environmental ideas

It is widely recognised that demonstration activities (including feasibility studies, validation and “scale-up” projects) provide a crucial bridge between laboratory-scale experiments and the commercial application of innovative technologies. In the case of environmental technologies this step, which can be decisive for the validity and ‘competitiveness’ of one technology vis-à-vis another, is often costly and lengthy since demonstration is too often based on ‘trial and error’.

One of the key messages in 2004 of the Commission’s Environmental Policy Review that monitors EU progress on its key environmental goals, is that eco-innovation can promote economic growth and maintain and create jobs.

Among the Commission’s recommendations in its first report on the implementation of the Environmental Technologies Action Plan (ETAP), the establishment of ‘green investment funds’ to mobilise risk funding, especially for small and medium-sized companies, can be highlighted.

The key objective being addressed by LIFE-Environment is to contribute to the development of innovative and integrated techniques and methods and to the further development of Community environment policy, through the co-financing of demonstration projects. However, the LIFE programme also pays important attention to dissemination, transfer and industrial application of research results, and brings up to date the traditional distinction between basic research and applied research which, in the past, has not always allowed European industry to benefit from all the research efforts made.



Sustainable management of dune/beach systems in Ireland. (LIFE96 ENV/UK/000404)

LIFE also plays an important role in projects where the final result is not as certain as it should be to get money from other sources. Thus, the LIFE programme helps to develop techniques or products, the market for which is uncertain, but which have potential environmental benefits.

SMEs are the main private beneficiaries of the LIFE programme. In one respect this is unsurprising since some 99% of Community firms have fewer than 250 employees (and 91% fewer than 20). Nevertheless, SMEs are one of the best targets for promoting innovation in environmental technologies:

- > SMEs account for 66% of jobs and 65% of turnover in the European Union
- > Enterprises with fewer than 100 employees account for virtually all new jobs
- > They export and innovate, but they have specific problems to overcome³.

However, in Europe many public innovation schemes remain tailored to large firms.

3. Several cases show how LIFE funding is a crucial factor for the development and demonstration of new ideas:

- > LIFE funding offers the only possibility for co-financing the project:

LIFE96 ENV/UK/000404 is a demonstration project based on informed, multi-sector, sustainable management of dune/beach systems in the North and Northwest of Ireland. This project could not find any better alternative co-financing than LIFE, which helped to bridge the gap between research and implementation.

The project (LIFE99 ENV/NL/000232) aimed at demonstrating the applicability of an innovative technology to produce packaging made of natural fibres and starch, which are both environmentally friendly and of a high quality. In 1998 Vertis B.V., being the beneficiary and mother company of PaperFoam BV, was looking for additional start-up capital. Venture capital firms and banks were not viable candidates for providing such capital.

³ Green Paper on Innovation* COM(95)688

LIFE offered an excellent funding opportunity for PaperFoam which also required funding with an international dimension, as offered by LIFE, which is an environmental demonstration programme at the international level

- > Even if LIFE is not the only option, it is the instrument that best fits with the project and the beneficiary's requirements:

LIFE96ENV/DK/000012 is a project on Integrated Cooperation on Sustainable Tourism Development and Recreational Use in the Wadden Sea Region. At the time of project preparation cooperation in the Wadden Sea region was not as coherent as today. LIFE-Environment financial support was flexible regarding several de-facto beneficiaries, their participation and possibilities to utilise the results. LIFE provided the project with good administrative and technical links to the Integrated Coastal Zone Management (ICZM) programme, which is the key issue throughout the project area. National, regional or local alternatives for funding, though of the same magnitude as LIFE funding, were not as easily available and would have required a long formal, budgetary process.

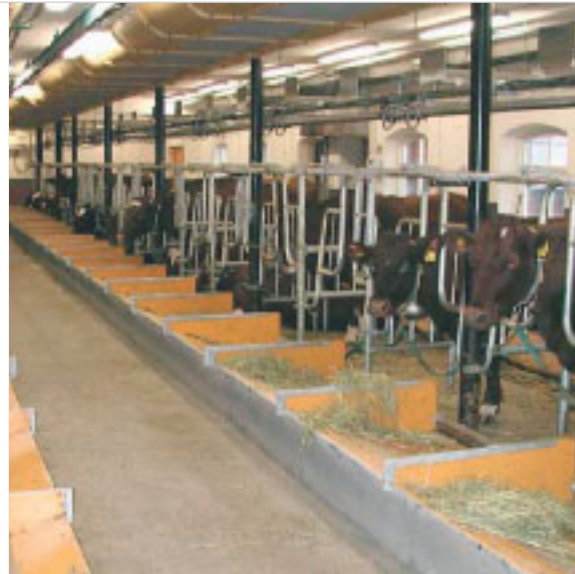


For the construction waste recycle system (LIFE99ENV/FIN/000222) LIFE was the most feasible option to fund the project. In theory there were other opportunities for funding, but conditions posed by LIFE were the easiest to meet.

LIFE99 ENV/S/000625, towards sustainable milk production - reducing on-farm ammonia loss, is a further example. At the stage when the project was initiated no other financing sources were available to provide lead funding for the proposed activity. The LIFE approach made it possible to construct a package of complementary funding around the LIFE contribution in order to implement the project in a comprehensive manner.

- > Even though the beneficiary can implement a project on its own, LIFE funding accelerates the process of reaching the goal.
- > Although LIFE is not the only source of finance, its funding has been crucial for projects whose budget is extremely high:

For (LIFE98 ENV/GR/000218) - PLASMA UNIT - "**Development of a demonstration Plasma Gasification/Vitrification Unit for the treatment of hazardous waste**", the budget for the design, construction and installation of a demonstration plasma unit was quite high. Therefore, the LIFE programme was considered of vital importance for the project's success and essential for carrying out the project along with other funding from the Viotia Prefecture, which was covered to a large degree by the Ministry of Environment, Regional Planning and Public Works.



Reducing ammonia loss on the farm: new tie-stalls are equipped with rubber slats. (LIFE99 ENV/S/000625)

Support from LIFE-Environment helps beneficiaries in the demonstration of innovative ideas at the right time in the innovation chain, making possible a wide range of processes covering not only technological products but also management methods.

For the future, the environment will continue to be strongly linked to innovation. The Commission is preparing a proposal for a framework programme that will support competitiveness and innovation (CIP the Framework Programme for Competitiveness and Innovation). It will bring together a number of existing Community programmes in the very fields that have been identified as most critical to boosting European productivity growth. Among these programmes is the promotion and demonstration of environmental technologies covered by LIFE.

Integrated cooperation on tourism development was key to this project. (LIFE96ENV/DK/000012)



5.4: LIFE projects: sustainable local successes



© Charlie Phillips Images (Moray Firth Partnership)

Bottlenose dolphins can be seen close to the shore around the Moray Firth during the summer months.

coastline stretching from John O'Groats (Duncansby Head) to the north and Fraserburgh to the east and out to the 12 mile (19 km) zone. Only about 130 dolphins live in the Firth and as such the population is vulnerable. A commitment to their preservation was the key to gaining the support of the Firth local communities in this LIFE-Environment ICZM project.

"Everyone loves the dolphins," says Rachel Harding-Hill, project manager of the community-led "Moray Firth" project, which was run by Scottish Natural Heritage, together with the Moray Firth Partnership (MFP) a voluntary coalition of over 620 members from a wide range of interests (industry, local authorities, conservation bodies, fishing organisations, and tourism groups), each keen to see the region thrive and prosper.

Undoubtedly, the dolphins helped raise awareness of the project; and because the Moray Firth population is rare in a European context, part of the project work involved action to get it designated as a marine Special Area of Conservation (SAC)¹.

In order to provide a clearer impression of the long-lasting local environmental impact of the LIFE-Environment programme, in this sector we have chosen to provide a report from-the-field: demonstrating what this experience has meant to the local community.

In the 12 years of the LIFE-Environment programme there are hundreds of examples of projects that had a long-lasting sustainable impact. These successes can be measured in a series of different ways: financially (for the project beneficiary) and/or environmentally (for the community) with say, an improved quality of life, and reductions in pollution, increased employment etc., for local residents. Many such projects are presented in the thematic sections (see chapter 4) of this publication. Continued environmental success has also been identified by a series of ex-post evaluations. These were carried out recently by the LIFE programme monitoring teams and are presented in the samples of pan-European projects, presented throughout this publication.

Moray Firth: a continuing, community-based environmental success

The following report, based on a visit in February 2005 to the Moray Firth project on the north-east coast of Scotland, United Kingdom, illustrates how co-funding from the LIFE-Environment programme helped build and develop an integrated coastal zone management (ICZM) project whose success and environmental impact has continued long after closure. Significantly, this project was able to actively involve local communities' right from the start – ensuring long-lasting, sustainable, environmental success.

The Moray Firth, Scotland's largest "firth" (an old Norse word meaning 'arm of the sea') is home to the world's most northerly population of bottlenose dolphins. Affectionately known as 'tumblers' there are regular year-round sightings of groups of 20-30 of these sociable and well-loved mammals along the 800 Km

¹ SACs are European designations covering areas of land or sea which protect rare, endangered or vulnerable habitats and species in the European Community. They contribute to the network of sites, Natura 2000, to help maintain the diversity of wildlife across Europe. Cardigan Bay in Wales is home to the only other resident dolphin population in the UK and is also being designated as an SAC

But the region has much more to offer its local communities, businesses and visitors: It is an area of spectacular natural beauty and is home to a rich diversity of wildlife, all of which play a vital role in the marine ecosystem. Other species include: Harbour Porpoise, Minke Whale, Grey Seal and Common Seal; Guillemot, Osprey (who spend the summer in Scotland and the winter in North Africa or Spain), Herring Gull, and the Eider Duck (the UK's fastest bird in horizontal flight).

In common with many coastal areas, the Moray Firth is under pressure and facing increasing environmental demands in trying to reconcile its different interests, which include oil, (22 km off the coast is the Beatrice Field, the closest inshore oil field in the UK) fishing, agriculture, industry, tourism and recreation. Therefore, the wider aims of the LIFE project were to bring together all those with an interest in the Firth, to develop better and more integrated ways of managing the coast and sea. A key element was the involvement in this process of local communities, while ensuring statutory and voluntary management measures were brought together.

In 1998, the MFP was awarded EUR 237,018 (49.8% of the total costs) of EC funding under the LIFE-Environment programme, for a pilot scheme, to run from November 1998 – October 2001, on three levels:

1. The local level – by involving the community or local residents;
2. The area level – the inner Moray Firth, or sub-area level; and
3. The regional level – the wider Moray Firth.

The demonstration project worked across these three levels, tackling issues in a variety of ways: at the local level, integrated coastal projects were carried out in the communities; at the area level, the project focused on the development of a management scheme for the candidate Special Area of Conservation (cSAC) for bottlenose dolphins; and at the regional level, the project aimed to produce Management Guidelines and an Action Programme for the region. This was a Firth-wide four-year strategy (i.e. continuing after the termination of the project), including over 150 essential actions to be implemented. An additional, important element was the dissemination of information about the Moray Firth to those who lived and worked there.

Ms Harding-Hill admits the pioneering 'bottom-up' approach to ICZM has not always been easy, particularly in the beginning: "This was something new and there was a general lack of understanding of what we were trying to do," she says, adding: "We were seeking voluntary participation, and we knew it was asking a lot of people, because they were all doing this in their spare time."

© Charlie Phillips Images (Moray Firth Partnership)

Adult and young seals can be seen on sandbanks on the remote rocky shores of the Moray Firth.

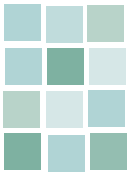
So how did they persuade local communities to participate?

This project proved that it really is "good to talk", she says, adding that the MFP was able to bring together the scheme's many partners by providing them with an opportunity to air their often widely disparate views. This proved integral to building trust and understanding and in helping to lay the groundwork for future ICZM development. "Quite simply, we wouldn't have been able to do this without the LIFE injection of cash," she says, adding that "LIFE gave us the boost we needed, right at the beginning."

But, there was another major difficulty to overcome, as Firth man and voluntary MFP board member Sinclair Young, explains: "Unless you've been brought up in the Moray Firth, you wouldn't understand this. But in order to get people involved, you have to be able to 'speak their language'," he says, adding that this needed to be someone well-known in the community i.e. somebody they knew they could trust.

The lengthy task of building trust was achieved by a good deal of groundwork - going out into the communities, hosting seminars, talks etc. In Mr. Young's view, this would not have worked if anyone but a local person had tried to sell the concept of sharing information to these relatively sparsely-populated communities. Outside the main city of Inverness, these are often small, insular, fishing communities who traditionally didn't communicate with each other: "If you're a fisherman and you've found a good place to fish, you're not going to share this knowledge with anybody else. This is the tradition. They just don't communicate... We got people talking to one another and they realised they had shared interests. This was a slow process, but it worked."





Results at project closure indicated 'substantial progress' towards achieving all objectives

When the project closed, it had made substantial progress towards achieving its main objectives on the local, regional and area levels. Today, four years after its termination, the Firth communities continue to benefit from LIFE's legacy:

Firstly, on the local level, the Communities Grants Scheme launched in the final year of the LIFE project, has proved to be one of the most successful aspects of the project. With some EUR 27,000 worth of LIFE funding, the scheme led to the creation of 22 local socio-economic projects. Examples included a mobile pontoon to help rescue stranded dolphins, porpoises and whales, beach and harbour area environmental improvement, and equipment for a school environmental study. Now funded by Scottish Natural Heritage and other sponsors, it is currently in its fifth year, and continues to provide modest sums for residents' own integrated coastal projects - anything from a few hundred pounds to a maximum of EUR 1,446. What started as a simple PR exercise has become "very, very successful," in helping to raise local awareness and enhance people's understanding of integrated coastal zone management, says Mr. Young.

Secondly, on the area level, after extensive consultation on a draft management scheme for the candidate Special Area of Conservation (cSAC) for bottlenose dolphins, the MFP produced a final 'working' document containing over 100 practical management measures to ensure that conditions for a healthy dolphin population were in place. Implementation of the cSAC scheme, established under the Scottish Executive and UK Government's implementation of the EC Habitats Directive (92/43/EEC), began in 2002, the year following the termination of the LIFE project and is still underway. But, as Ms. Harding-Hill explains, this is a long-term process



© Caroline Warburton (Moray Firth Partnership)

and there will be a considerable period (8-15 years) before the ultimate environmental benefits are known.

Thirdly, on the regional level, following the two-year public consultation exercise, which identified the concerns and aspirations of all stakeholders, the "Moray Firth Management Guidelines and Action Programme" was published. This contains 166 essential actions for the Firth region, of which over 70% have now been implemented. These included the co-ordination of a series of best-practice seminars – soft coast management, the EC Water Framework Directive and beach awards were just some of the topics explored.

The guidelines have also resulted in the formation of the Moray Firth Fisheries Action Group, which now meets regularly and coordinates the activities and concerns of all the Firth fishing organisations (this group didn't exist before the LIFE project); and the "Dolphin Defenders" programme. Particularly popular with schoolchildren, this educates youngsters about conservation of the bottlenose dolphins. Participants in the scheme, which is funded by BP, can go to the new website: <http://www.dolphindefenders.co.uk/> and make an online 'dolphin pledge'.

Firth youngster 'Sam' volunteers for a beach clean-up project, launched under the LIFE co-funded Communities' Grants Scheme.

Other recent initiatives resulting from the guidelines, include the "Clean Beach" scheme to encourage community action to cut down on coastal litter; working guidelines for marine noise and a seminar to debate the implications of climate change on the Moray Firth.

Regarding dissemination, a variety of 'working tools' was created during the LIFE project, following a series of workshops with communities to discuss and understand their information needs. Chief among these were the MFP website, an electronic discussion forum and search facility, and a series of newsletters "Moray Firth Matters" – distributed to MFP members, local organisations, businesses, schools and libraries. Unfortunately, due to lack of resources, the newsletter is no longer published. But, the website remains open at: <http://www.morayfirth-partnership.org/> providing details about the Firth, its history and people, marine habitats (with a link to the new bottlenose dolphin website), coastal habitats, water-quality, and grants.

Ms. Harding-Hill concludes that the LIFE programme provided the injection of cash to help 'kick-start' the long-term process of integrating the management of the coast and sea. Many lessons have been learnt and substantial progress has been made. In the short-term further resources have been found² to continue the community grants scheme and the implementation of the cSAC management scheme for bottlenose dolphins. In the medium to longer term, the MFP needs to secure further resources to build on what was achieved through the EC LIFE project. "It was very much a learning process for all of us. We made mistakes and we learnt from these mistakes... That is what was so important about this programme. Most other funding is directly related to results. LIFE enabled us to develop an integrated process which we can now go on to implement. It was very important."

² Sponsors include Scottish Natural Heritage, The Crown Estate, Aberdeenshire Council

The 800 Km Moray Firth coastline stretches from John O'Groats (Duncansby Head) to the north and Fraserburgh to the east and out to the 12-mile (19 Km) limit.

(Illustration by John Marshall, Edinburgh)

Moray Firth Partnership Communities Grants Scheme

This scheme was launched as a direct result of the LIFE-Environment programme. It provides grants of up to EUR 1,446 at 50%-70% of the total cost, for coastal-based, community projects that link in some way to the Moray Firth Management Guidelines. The projects are extremely varied, but they have to show "clear benefit to the local area; its community and visitors; and to improving the local quality of life". Some examples are as follows:

- > EUR 1,446 towards a new boat trailer for the Whale and Dolphin Rescue Boat. According to the MFP, this has been well-used: between May-October 2003, 73 boat-based cetacean (whales, dolphins and porpoises) surveys were carried out covering the coastal area between Lossiemouth and Fraserburgh.
- > EUR 1,301 towards a replacement engine for the "Liberty", a traditional 'Fyfie' fishing boat. Built in the 1930's in Fraserburgh, it is now used as a safety boat and escort tug. Volunteers carried out the refitting of the boat, which, skippered by the MFP's Sinclair Young, was displayed at the Scottish Traditional Boat Festival, held in July 2004, at Portsoy.
- > EUR 180 towards the replanting of a wild-flower area. The area, which provides access to an historic mass grave and cairn, (ancient memorial made from stones), has been tidied, wild flower seeds sown and some native shrubs and trees planted.
- > EUR 397 for an artist to be employed to work with local youths to create a mural (to replace graffiti) on the sea wall at Lossiemouth Harbour. The 30m x 4m mural has been well-received and latest reports indicate no further graffiti there.
- > EUR 1,446 towards the renovation of the Brora Harbour slipway. The old slipway was broken and sloped too steeply, making it difficult to winch boats out of the water.

Project Number:

LIFE98 ENV/UK/000608

Beneficiary: Scottish Natural Heritage

Total eligible cost: EUR 475,838.08

EC Contribution: EUR 237,018.40

Period: 01-Nov-1998 to 01-Nov-2001





5.5: The LIFE programme accelerated the dissemination of results and networking of innovative environmental projects



Disseminating results: Check-it! guide to greener public procurement. (LIFE98 ENV/A/000551)

this dissemination is also extremely effective on a national and international scale. Here the use of trade and specialist press proves particularly effective. But the use of electronic material (e.g. websites), regional and even national radio and TV stations, the hosting of national and international conferences and seminars all prove extremely effective in spreading knowledge and information about LIFE-Environment projects.

This is the main reason why, in order to obtain a grant from the LIFE programme, beneficiaries have to make a commitment to undertake a certain number of dissemination activities that will illustrate the results of their projects to other interested parties.

The European Institutions view increased communication as an important element of European governance. It is an essential tool for transparency, a strong requirement when EU tax-payers' money is being used. Communicating the results of LIFE projects is seen as a key way of demonstrating that money was used in a fair way.

From a European point-of-view, communication has several objectives: the promotion of the LIFE programme, dissemination of up-to-date information on the Union's priorities, putting all would-be beneficiaries on equal footing. On a more sectoral basis, good communication on projects could avoid duplication of existing projects. Finally, at local level, the protection of the environment is promoted by the project promoters, using techniques adapted to the local context.

1. LIFE-Environment beneficiaries are the key to successful communication & dissemination

Project promoters or so-called 'beneficiaries' are best placed to promote the results of their projects and to disseminate the information needed to replicate their projects elsewhere. They are also best placed to promote their projects both at the local level, since many projects have a territorial dimension; and at the wider regional, national and pan-European level.

At the local level, by using the local or regional press, radio and TV, organising open days and seminars, beneficiaries are disseminating a positive image of Europe and of their achievements among the local population. Since many projects involve partnerships across a number of countries,

Reflecting a growing awareness of the role of communication at a European level, these requirements for the beneficiaries have grown stronger over the period of LIFE I to LIFE III (1992-2004). Indeed, under the current programme, in 2005, a beneficiary must undertake at least the following communication actions:

- > The main project results must be included in a website. In this way, information on the projects is available as work progresses and not only at the end;
- > Towards the end of the project, beneficiaries are obliged to produce a layman's report in paper and electronic format. As the title suggests, this report, of 5-10 pages in length, is targeted at non-technical people and presents in English and in the beneficiary's language (s) the main results of the project;

- > All material produced as a result of a LIFE grant must bear a clear reference to LIFE financial support (including the LIFE logo); and
- > Visitor access to the site of the project must be organised. The beneficiary must erect and maintain notice boards describing the project at strategic places accessible to the public.

While these actions are an obligation for beneficiaries, further communication activities are also strongly recommended and a good communication plan is considered as an important part of the project. (It is also one of the key criteria for a successful application for funding). Such additional activities include:

- > Organisation of events for the local community or for visitors: public information meetings, meetings with interest groups, guided visits...
- > Workshops, seminars, conferences: These events must have a clear output (reports, articles in trade and specialist periodicals, etc..).
- > Production of brochures, films, etc.
- > Technical publications on projects in trade and specialist periodicals.
- > Media work. The beneficiary should liaise with the media at the most appropriate level to ensure the best coverage of the project's results.

Other types of dissemination material can be used and beneficiaries are requested to use their creativity to come up with innovative dissemination methods.

LIFE example: use of creativity in dissemination

“European network for the assessment of air quality by the use of bio-indicator plants”

The Eurobionet project promoted the use of bio-indicators for monitoring air-quality. The project had 12 partners in eight Member States. Its overriding goal was to use a selection of plants to illustrate in a concrete, visible way the negative effects of pollution. The idea was that if people could see what pollution does to a plant, then they would be able to understand the implications on the environment in general and on human health.

The project established pollution monitoring posts in the form of giant green boxes in the streets of several European cities. These were open to the public and contained a selection of bio-indicators – plants such as tobacco, poplar, grass cultures and curly kale, which are sensitive to air conditions. Visitors to the green boxes were able to see how the plants reacted to air pollution. The EuroBionet team succeeded in setting up 100 monitoring stations in the partner cities, and in building a network of cities – ranging from Edinburgh in Scotland to Glyfada in Greece – that are concerned about air quality and committed to raising awareness of the issues at stake by hosting regular information events and publicity campaigns.

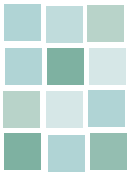
As part of the dissemination, the team produced small folding boxes replicating the boxes in the streets. These were to be used on desktops for holding pens, pencils and other small desk accessories. EuroBionet also developed partnerships with schools, with the objective of engaging children in the process of making healthier lifestyle choices.

After the project closed, the project team released a detailed manual so that other countries and regions could transfer the methods for their own use. This information was subsequently used by the East Hungarian Bio-monitoring Network for the basis of its LIFE produced LIFE00 ENV/H/000936 (see chapter 4, section 4.1)

Project Number: LIFE99 ENV/D/000453
Beneficiary: Institute for Landscape and Plant Ecology, University of Hohenheim, Stuttgart
Total eligible cost: EUR 2,402,678.15
EC Contribution: EUR 1,201,339.07
Period: 01-Oct-1999 to 31-Dec-2002



Interactive learning inside a “Green box”



Today, each on-going LIFE project has a website on which the progress of their work is regularly reported, making it the only source of information for projects that are not currently closed. See box (right) for a list of interesting websites, allowing the reader to open a window on on-going projects.

The impact of this communication and dissemination activity is considerable. Each of the 1,404 LIFE - Environment projects has undertaken several activities, leading to a high level of public exposure of European intervention in the field of environment.

Eco-friendly event management: a 'Smash Events' poster.

LIFE example: Dynamic use of the Internet

LIFE02 ENV/NL/000117:

The project aims to demonstrate the first full-scale application of Membrane Bio Reactors technology for treatment of municipal sewerage. A webcam allows viewers to follow live the building of the site where the project's results will be hosted. <http://www.wrij.nl/>

LIFE00/GR/0671:

Minos is a project looking at an ecological use of the refuse of olive oil production. The website is simple, but contains all the necessary information together with good illustrations. <http://www.pharm.uoa.gr/minos>

LIFE00 ENV/B/0285:

Smash Events is a company promoting ecological event- management. The website is published in five languages and contains a good deal of useful information on reducing the production of waste when large events are taking place, improving the mobility, etc.. <http://www.smash-events.net>

LIFE02 ENV/D/ 000408:

On this site, a webcam allows the viewer to follow the drilling in Aachen city centre, Germany, of a 2500 m hole in order to reach thermal power for heating. The "Super-C project" can be seen live on: <http://www.superc.rwth-aachen.de/>

LIFE02 ENV/IT/000017:

The Pattern aims at creating a management model for fragile areas with the aim of integrating the preservation of the nature with the promotion of a diversified economy and the enhancement of social welfare. The website is exceptionally attractive. The project also uses street-theatre, has special initiatives for children, etc. <http://www.lifepattern.it>



"Smash Events" website provides tips on managing events.

LIFE02 ENV/E/000241:

The Ecofoot project aims at promoting a Euro-wide eco-label for the production of footwear. Since one of the issues for the project is the large-scale recognition of the label, the Internet site is in nine languages, including Arabic. <http://www.ecoshoe.info/>

Home-page of the "Smash Events" website.



LIFE example: substantial dissemination activity
“Sustainable development of European coastal regions and creation of a regional cycle under inclusion of integrated environmental protection”

This project aimed to find solutions to the problem of beaches polluted by large amounts of algae and sea-grass. The project team developed techniques for gathering this raw material and also looked at solutions for transforming it into different kinds of final products. Sea-grass is an excellent insulation material for the construction industry as it is fire-resistant, easy to handle and has high heat retention capacity. It can also be used in the production of animal hygiene products, oil-binding agents, etc.

The project has thus resulted in a viable business. It has received entrepreneurial awards and has been especially active on the communication front:

- > The project has been featured by a number of TV stations, in reports of up to 45 minutes length. It has featured on the main German public service channels (ZDF, ARD) and five others such as ARTE.
- > Over 119 articles were published in regional and national newspapers as well as in specialist magazines.

- > The project was active in Germany, Denmark and France. For each country a minimum of two flyers and information files were disseminated.
- > The project partners participated in 24 fairs with their own stands and presented the Regional Cycle project on 28 meetings in Germany, France, Denmark, Belgium and Tunisia.
- > Additionally more than 19 information events were carried out for a broad variety of target groups
- > 10 workshops were organised with a total of more than 450 participants.
- > 112 participants from seven countries attended the final international congress held in Gross Schwansee, Germany (5-6 September) 2003. See the project website at: <http://www.life-seegrass.de/>.

Project Number:

LIFE00 ENV/D/000312

Beneficiary: Amt Kluetzer Winkel

Total eligible cost: EUR 3,897,295.00

EC Contribution: EUR 1,814,861.00

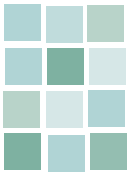
Period: 01-Jan-2001 to 31-Dec-2003

Going beyond transfer of know-how or of technology, networking brings additional benefits. There are often several projects undertaken on the same subject in different parts of the Union. They differ from each other due to the local context or due to the specific approach taken by the beneficiaries. It is often valuable for those projects to meet and organise exchanges in order that the value of the output can be enhanced and ideas can be shared.

LIFE-Environment, unlike LIFE-Nature, does not currently provide specific financial support for networking, although many projects involve a number of partners from different Member States. This was the case, for example, with the project "Wise use of floodplains" (LIFE99 ENV/UK/000203), which brought together 14 partners from France, Ireland and the UK in a comparative analysis of the methods used to manage wetlands. The LIFE programme recognises the value of such trans-national networking and places a high priority on the evaluation of application for projects with a clear trans-national dimension.



*Beach Tech 3000
beach cleaning device*



2. Communication at European level helps to disseminate the positive results of the LIFE-Environment programme

The LIFE-Environment programme itself has always been supported by a series of communication tools including: the website, thematic publications, public presentations, etc. However, in the framework of LIFE III, the Commission now places even more emphasis on communication. A Communication Strategy was established in early 2002¹ and an acceleration of the communication work was soon noticeable. A series of actions were undertaken between 2002 and 2005:

Redesigned LIFE website

The website was restructured and redesigned in 2002, and has become the most important communication tool for the LIFE programme. Its different sections provide information useful for different types of target public:

- > The "News" section attracts a public interested in environmental innovation.
- > The "Funding" section is the most popular, attracting tens of thousands of hits annually, but in particular in the month preceding the annual deadlines for the LIFE applications.
- > The "Project" section gives access to information on the projects and their results. Important work has been undertaken to update the database of projects, which offers access to all the results of the LIFE II and III programmes via sophisticated search facilities.
- > The "Info products" section contains the media available on the LIFE projects: publications, web links, etc.
- > The "Tools" section is more oriented to the beneficiaries of the programme and proposes information about how to manage a LIFE project.

Visits to the website have grown consistently since its redesign, with the traffic increasing from 123,194 hits in September 2001 (peak time due to the opening of the calls for proposals) to 218,254 in November 2004 (peak time for that year).

¹ See http://europa.eu.int/comm/environment/life/toolbox/strategy_part1_en.pdf

Illustrating the thematic publications produced by the LIFE Unit.



The LIFE website key communication tool for the LIFE-Environment programme

Monthly Newsletter

"NewsFlash LIFE", is monthly Newsletter providing information on the programme, presenting some successful projects and identifying interesting events and publications linked to the programme. The Newsletter has around 10,000 regular subscribers.

Thematic publications

The LIFE Unit has produced a series of thematic publications looking at the impact of LIFE on several sectors: Water, EMAS, Clean Technologies, Waste management and Air quality.



Conclusions

Have 12 years of LIFE been successful? ... The previous chapters, with their descriptions of many innovative and successful environmental projects, have hopefully provided a clearer idea of the achievements of the LIFE-Environment programme over the last 12 years.

12 years already...but what are 12 years?

On the scale of a national or multi-national co-funding programme, 12 years may seem a long period - many political changes, priorities, administrative reforms have occurred during the lifetime of LIFE. However, a 12-year time-scale is insignificant, when considered in the wider environmental context of two centuries of industrialisation, coupled with substantial population and economic growth.

The growth of environmental consciousness since the 1980s has pushed decision-makers and the scientific community to launch actions to protect our environment. This momentum saw its first major expression at the Rio Earth Summit in 1992, which is considered by some as the first humanitarian consciousness event to pave the way for a sustainable world.

1992 was also an important year for the European Union. With the launch of the LIFE programme, the Union gained a financial instrument that provides the financial means to act in a concerted way to support innovative environmental projects within the EU, but also in other neighbouring countries through the LIFE-Third countries component of the programme. LIFE set out in a concerted way to repair environmental damage, to change our behaviour and to innovate with greener technology so that Europe can remain competitive.

LIFE has contributed significantly to raising awareness of environmental issues and to changing people's attitudes towards 'green' issues

Many projects have informed or trained decision makers, industry staff or the public about environmental issues. Many projects have dealt directly (direct involvement) with EU citizens. Many waste projects, for example, have promoted new practices in towns or rural areas. These have been received positively by concerned populations.

Through the requirement for a strong information and dissemination component in each project and by its own dissemination actions, LIFE has directly or indirectly fostered environmental awareness in almost all, if not all, homes in the Union.

LIFE creates trans-boundary cooperation and provides networking opportunities both within and outside the Union

The environment doesn't recognise frontiers. The air we breathe and the water of our rivers are not stopped by physical borders. Environmental problems need to be tackled in concerted and trans-national ways. By prioritising innovative projects that have a multinational dimension, LIFE has facilitated trans-boundary cooperation in the environmental sector, but also cooperation between industries, universities and research centres in different Member States.



Many LIFE projects such as this recycling initiative have been well received.

Public and Private sectors in need of LIFE

The programme has been equally successful for the European public and private sectors. The growing number of project proposals received each year – above and beyond the increase in new proposals due to EU enlargement – shows that there is a strong demand for such a financial instrument.

LIFE-Environment components have different benefits for private or public stakeholders. While clean technology has been a focus of the private sector, awareness projects have been implemented mainly by the public sector. LIFE has therefore contributed to the specific needs of these sectors.



LIFE has filled an important gap in the innovation chain between research and development (R&D) and full-scale development

As illustrated in this publication, LIFE has been able to play a key role during these last 12 years because investors (private or public) are reluctant to provide capital for projects at the full-scale demonstration stage. The important role of LIFE in filling this gap has been highlighted by many beneficiaries. In the industrial sector, LIFE has allowed many companies, from SMEs to well-known multinational companies, to produce products in a cleaner way, while doing so competitively. As such LIFE has helped progress the R&D process, and where technical and economic viabilities were proven, has allowed new products and/or services to be brought to the market. LIFE has thus fulfilled the Lisbon objectives in terms of competitiveness, creation of employment and economic growth.

Better integration of the different phases of the innovation chain is at the heart of the agenda of the EU through the ETAP initiative.

LIFE, a player of the environmental legislation process in Europe

The EU has been a key player in creating or harmonising environmental legislation in Europe across many sectors (for example, water, waste, chemicals, air), thereby filling a gap in the legislation in many Member States. LIFE has contributed to supporting this process either by facilitating the necessary input or information for setting-up or fine-tuning legislation, or by allowing local, regional and national authorities to undertake specific actions in the framework of applying these laws and regulations.

This important role has been recognised under the 2005 LIFE programme, which has seen allocation of a specific budget to fund preparatory projects. This is recognition of the efficient tool that the instrument can be in relation to the preparation or fine-tuning of environmental legislation.

LIFE has a high multiplying effect and provides value-for-money

Selection of projects is mainly based on criteria linked to innovation, environmental relevance and a capacity to reproduce or implement the results elsewhere, or to bring to the market new cleaner products or services. One of the criticisms of the independent evaluation of the LIFE programme, carried out by AEAT in 2002-2003, was that, under LIFE I and II, project results were not particularly well disseminated.

This has been addressed under LIFE III onwards, so that today, a strong and relevant dissemination of project progress and results (and more recently, by follow-up 'ex-post' evaluation reports after closure) to potential stakeholders (consumers, environmental authorities, industries) is an essential prerequisite of co-funding. The contribution from the Union usually varies from 30% to a maximum of 50% of the eligible costs, with the remainder coming from the beneficiaries themselves and/or other public or private donors. As such it can be concluded that the value for money of the LIFE contribution is high.

LIFE is a competitive programme

Project applicants are aware that on average, under LIFE I to LIFE III in 2004, less than 25% of project proposals were selected for LIFE-Environment co-funding (through the available annual budget) and that this highly competitive selective procedure has allowed only the best proposals to be accepted. Despite this, the number of proposals received every year has been increasing since the start of the programme. The rigorous selection procedure is sometimes criticised by applicants for being too lengthy. But, it reflects the need to fairly and accurately evaluate technical proposals from a wide variety of sectors and themes, and once selected, to ensure projects are immediately on the right track for implementation.



Success in delivering LIFE projects often opens new doors.

LIFE is managed in a rigorous manner

Although the number of staff appointed to the management of the LIFE-Environment programme is limited, when compared with other community programmes, the LIFE Unit applies strict and efficient administrative and quality control procedures. This allows the European Commission to quickly assist beneficiaries in the implementation of their projects, while also ensuring proper use of EU public funds.

LIFE the logo

As highlighted in this publication, co-funding is not the main priority for those who applied for LIFE funding. LIFE has allowed many companies to gain credibility by supporting their project goals. In many cases LIFE co-funding has been the catalyst that enabled beneficiaries to obtain their own match-funding, as support from LIFE has given the project another, international, dimension. Success in delivering LIFE projects often opens other doors.

Combating past and present threats to the environment, avoiding new ones by implementing precautionary measures, drafting or adapting legislation, producing cleaner technologies etc – a lot has been achieved, however there is still much to do - the EC will pursue its efforts with stakeholders in this direction.

European Commission Environment Directorate-General

This is a special issue of LIFE Focus the journal of the LIFE programme.

LIFE ("The Financial Instrument for the Environment") is a programme that was launched by the European Commission and is coordinated by the Environment Directorate-General (LIFE Unit - BU-9 02/1).

The content of LIFE Focus "LIFE-Environment 1992-2004: demonstrating excellence in environmental innovation" does not necessarily reflect the opinions of the institutions of the European Union.

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<http://europa.eu.int/comm/environment/life/infoproducts/index.htm>

LIFE, Natura 2000 and the military (2005 - 86 pp. - ISBN 92-894-9213-9 - ISSN 1725-5619)

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)

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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.

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