



focus



LIFE and local authorities

Helping regions and municipalities tackle environmental challenges

EUROPEAN COMMISSION ENVIRONMENT DIRECTORATE-GENERAL

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Frédéric VALLIER
CEMR Secretary General



Local and regional authorities have a key role to play in implementing European environmental policy and in reaching its ambitious objectives. In this sense, the LIFE+ programme constitutes an important instrument in helping fund local and regional environmental policies and projects with a European added value.

Many local and regional governments are already leading the way in the implementation of forward-looking and innovative environmental policies. European municipalities and regions have the necessary tools at hand to take action. Their democratic accountability to citizens and their pre-established relationship with the population and private sector are crucial when it comes to implementing measures for sustainable development and improving quality of life.

However, many challenges lie ahead for decentralised government, including climate change, the need for an integrated environmental policy approach, for new skills and expertise, and the search for new sources of financing. The current economic downturn is also an issue as it puts local and regional budgets under pressure, while increasing the demand for public and social services.

The EU has a crucial role to play in helping tackle these challenges. Its contribution is decisive when it comes to supporting the flow of information and the exchange of best practices and to developing financial incentives, innovative technologies and a favourable legislative and regulatory framework.

Through this publication, CEMR invites European municipalities and regions to explore the potential of LIFE+ and to take advantage of the lessons and experience of existing projects. We hope that these local and regional authorities will find relevant information and become inspired by LIFE+ projects so as to pursue their own environmental initiatives.



Jean-Francois BRAKELAND
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The European Commission's LIFE programme has played an important role in demonstrating innovative approaches to the environmental challenges facing Europe's local and regional authorities (LRAs). To date, LRAs have led nearly 400 LIFE Environment co-funded projects, and partnered with other beneficiaries in over 200 more.

A selection of these projects is included in this latest LIFE Focus publication, "LIFE and local authorities: Helping regions and municipalities tackle environmental challenges". The projects provide a fount of useful knowledge and examples of best practice for local governments across the EU. This publication highlights the fact that Europe's local and regional authorities can take the lead in implementing policy objectives formulated at EU level and have a key role to play in improving citizen awareness and encouraging public participation in actions to improve the environment.

I hope this latest brochure will inspire and encourage other LRAs to follow suit and grasp the opportunities presented by the LIFE programme to develop projects that help tackle the significant environmental challenges we face and improve the quality of life for all.



Foreword.....1

Introduction3

Sustainable development and integrated decision-making at local and regional levels.....3

LIFE and local and regional authorities4

Transport.....5

Sustainable mobility: tackling local and regional transport challenges6

LIFE helps LRAs in implementing sustainable mobility8

Removing airborne particles is fine work for Klagenfurt12

Waste management15

Local and regional authorities managing waste issues16

LIFE and LRAs pioneer new approaches to waste management.....18

LIFE encourages waste prevention in Finland22

Climate change25

Local and regional action on climate change26

LIFE enables innovative responses to climate change at local and regional levels28

The rise and fall: Rome leads the way on carbon emissions32

Water management.....35

Policy challenges in water management.....36

Working with LIFE to face water management challenges38

FLOODSCAN pinpoints flood risks in Bavaria42

Spatial planning.....45

Spatial planning challenges for local and regional authorities46

LIFE support for spatial planning by LRAs.....48

SUN lights the way for community engagement in spatial planning52

Projects developed by local and regional authorities.....55

Available LIFE publications57

Sustainable development and integrated decision-making at **local and regional levels**

Integrated management at a more local level is essential to ensure that sustainable urban and regional development becomes a reality and that European regions, cities, towns and villages are transformed into more attractive places in which to invest and work.

To achieve this goal, local and regional authorities (LRAs) need integrated approaches that include a long-term strategic vision linking different policies at different administrative levels. Development must not only be coherent, it must also be sustainable. This means respecting the environment, promoting environmentally friendly technologies and products, sustainable transport and energy and infrastructure initiatives, as well as measures targeting water, air, biodiversity and nature protection¹ and the social and economic aspects of sustainable development.

Integrated environmental management also means tackling related issues together, such as urban management and governance, integrated spatial planning, economic well-being and competitiveness, social inclusion, and environmental stewardship.

A CHALLENGING ENVIRONMENT

LRAs face significant environmental challenges in areas as diverse as transport planning, waste management, water management and spatial planning, not to mention the growing impact of climate change.

LRAs play a pivotal role in helping to keep Europe moving, yet the diverse tasks of transport planning are complex and regularly involve harmonising competing socio-



Developing local carbon markets is just one policy area in which LRAs have an important role to play

economic and environmental demands. The ability of LRAs to link citizens to producers and educate the public about individual waste management means they have a significant part to play in efforts to prevent waste at source. They are also at the forefront of climate change mitigation and adaptation efforts. Key water management challenges at local and regional level include improving and adapting sanitation infrastructure (including making planning and design more water sensitive), and making the public more aware of the need to save water. Among the most pressing spatial planning challenges that LRAs must address are how to manage the complex relationship between man-made and natural systems or networks, and how to reconcile the need for new economic development with protected areas of green space.

HORIZONTAL AND VERTICAL INTEGRATION

In each of these areas, successful action relies more and more on integrated decision-making. This means integrating not

only the different administrative units and operational and political tiers within a local or regional authority, but also increasing co-operation with neighbouring municipalities or regions and improving links with national and European levels of public administration.

Yet, this can prove to be a difficult task, particularly if it requires amalgamating budgets previously controlled by separate departments of an authority or at different levels of government. Engaging all relevant actors in solution-finding will help avoid conflicts and produce a common long-term vision for development at local and regional levels. This includes enabling greater stakeholder participation in the setting of goals, the definition of activities, and the evaluation of results. As the levels of public administration closest to the public, LRAs are uniquely positioned to help bring environmental best practices and eco-innovation to a wider audience and, in the process, help deliver sustainable, economically vibrant and socially just environmental management.

¹ http://ec.europa.eu/regional_policy/themes/environment/index_en.htm

LIFE and **local and regional authorities**

Local and regional authorities have been among the most important “actors” in the 18-year existence of the LIFE programme, leading a total of 385 LIFE Environment projects and partnering with NGO and private sector beneficiaries in a further 220.

Local and regional authorities (LRAs) have been at the forefront of implementing environmental innovations that tackle many of the challenges Europe faces, from the threat of climate change to sustainable transport and mobility, from waste and water management to spatial planning.

COVERING ALL THEMES

Of the 605 LIFE Environment projects that involve LRAs either as beneficiaries or partners, the largest proportion (17.9%) are concerned with land use and planning (see Figure 1).

Waste and water-related projects have also been well represented to date, with 118 of the former and 130 of the latter. This is understandable given that responsibility for both waste and water management is often devolved to the regional or municipal level. Waste recycling has

been the most covered waste-themed topic, with 29 LIFE projects to date. A further 18 projects have covered municipal waste issues (including both household and commercial waste). Among water-themed projects, wastewater treatment has been most covered area, with 45 projects; 27 projects have dealt with river basin management. Wastewater treatment is also the most represented sub-theme among all the LIFE Environment projects involving LRAs, closely followed by EMAS and transport planning (43 projects each – see figure 2).

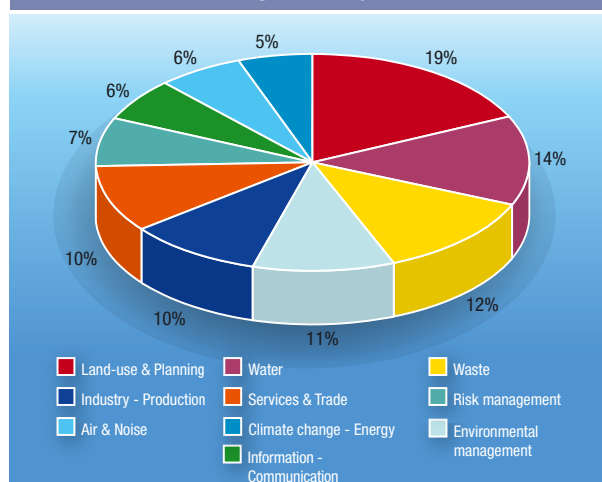
Whilst there have been comparatively few LIFE projects involving local and regional authorities that have tackled climate change and air and noise pollution challenges, those that have taken place have in many cases played an important role in developing new best practices and disseminating these across Europe (see pages 8-14 and 28-34 for examples).

THE VITAL ROLE OF LOCAL AND REGIONAL AUTHORITIES

In conclusion, LRAs have an indispensable role to play in bringing eco-innovations and environmental best practices to a wider audience: because they are in close contact with the public they can raise awareness and encourage changes in behaviour. This can take many forms: from persuading more householders to separate waste or use water meters to involving citizens' groups in riverbank restoration projects, from rewarding businesses that reduce emissions or develop sustainable approaches to mobility to showing how stakeholders can join in the development of Biodiversity Action Plans.

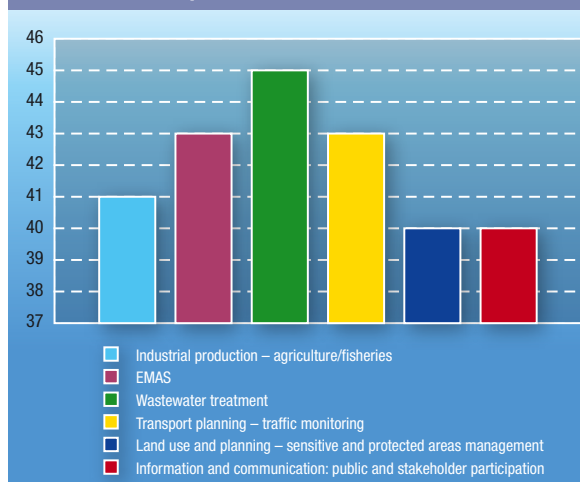
If LIFE funding were only to go to industry for eco-innovation, citizen awareness and involvement would be reduced and innovations would be less likely to have an impact at the local level.

Figure 1: Division of 605 LIFE projects involving LRAs by theme



Source: LIFE project database

Figure 2: LIFE projects and LRAs - the most represented sub-themes



Source: LIFE project database



→ **Transport** & *local/regional authorities*



Photo: LIFE98 EN/B/000269

Sustainable mobility: **tackling local and regional transport challenges**

Local and regional authorities (LRAs) face many challenges in the delivery of their transport remits and sustainable approaches are increasingly recognised as offering cost effective solutions.

Local and regional authorities are aware that transport plays an important role in the daily life of European citizens. Transport remains an essential lifeline for an ever-growing number of people in terms of quality of life and gaining access to employment, schools, shops, leisure activities or public services. Transport also makes a vital economic contribution: in 2009 the European Commission noted that transport sector activities accounted for some 7% of total EU GDP.

LRAs take much of the responsibility for keeping this crucial component of European life moving. Their tasks are diverse and regularly involve resolving competing socio-economic and environmental demands. Careful planning provides solutions to these challenges and can help transport managers forecast new requirements, react to unexpected emergencies and ensure the efficiency of existing systems.

SUSTAINABLE TRANSPORT SOLUTIONS

Transport planning is a discipline that municipal authorities need to constantly update in order to maximise control over transport-related factors in their territory. Sustainable Mobility Plans provide one of the main management tools for achieving such goals and these instruments need to be designed to complement other local authority planning activity, for instance regarding infrastructure, housing and land use developments.

Securing public finance investments to maintain and upgrade transport networks for the purposes of compliance with 'green' standards or implement sustainable mobility solutions is a highly challenging task, especially in times of economic downturn. However, informed transport stakeholders realise that financial benefits are available by adopting longer-term horizons and forward-looking perspectives. New technologies and innovative thinking can help demonstrate both economic and ecological advantages from long-term investments in



THE EU'S NOISE DIRECTIVE

The EU's Noise Directive (2002/49/EC) sets out to prevent harmful impacts from noise pollution. Common standards are applied by Member States to monitor noise levels in order to diagnose and control noise-related threats. Noise maps and action plans are essential aspects of the directive's noise-management toolkit, both of which are implemented by local authorities.

the likes of cleaner or more fuel-efficient vehicles, for example. Here, municipal vehicle fleets provide opportunities to pioneer and pave the way for cost-savings that can be achieved from economies of scale following wider uptake of new environmentally-friendly transport options.

Developments in the quality, quantity and range of public transport services represent another area where LRAs can make a major contribution to sustainability agendas. Public transport investments can help reduce traffic volumes, limit congestion and negative environmental effects and so offset escalating costs associated with road maintenance or abatement of air pollution.

Planning and implementing improvements in inter-operability between different transport modes further strengthens the value-for-money gained from public investments promoting integrated transport networks. Encouraging service sectors to locate within walking or cycling distance of their main user groups is also a power that local authorities can harness to help reduce transport demands and enhance the overall cost-effectiveness of their strategic planning actions.

Rural communities throughout Europe remain one of the high priority areas for better access to public transport facilities and transport plays an important role in the interdependence between urban and rural areas and in intra-regional cohesion.

LIFE SHOWS WAYS AHEAD

The road to achieving fully sustainable transport systems for Europe's local and regional authorities may be a long and winding one. Nevertheless, more and



KEEPING EUROPE MOVING: TRANSPORT POLICY AND LRAS

Local and regional authorities play a pivotal role in ensuring smooth interaction between the various components of Europe's transport sector and complex challenges are involved in 'keeping Europe moving'. High amongst these challenges is the need to maintain efficient, well integrated, inter-modal, resilient and low-carbon transport systems covering road, rail, air, sea and inland waterways.

Being a shared policy competence between local, regional, national and EU levels, key challenges also exist in co-ordinating transport developments. Numerous European initiatives require consideration by local and regional authority transport departments, including directives such as those governing air quality and noise impacts. The Europe 2020 strategy for smart, sustainable and inclusive growth and its policy work with climate action are relevant to support the mobility policies of LRAs. The EU's action plan on urban mobility (2009) and EU legislation on Intelligent Transport Systems (2010) are other recent initiatives that are very important for local and regional authorities.

Finding the right path through this sometimes inconsistent and often dynamic policy arena can prove to be a difficult task for decision-makers at local and regional levels.

The EU is currently updating its transport policy to reflect new developments. A new White Paper will identify the EU transport strategy for the next 10 years and create a framework supporting sustainable mobility policies.

Integrated, technology-based and user-friendly transport systems have been highlighted as potential priorities for the new policy. Environmental sustainability, alternative energy resources, urban growth trends, the impacts of globalisation, and demographic issues influencing mobility are also anticipated to have a significant effect on the future work of Europe's transport policy stakeholders.

more local and regional governments are now embarking on this journey with increasing enthusiasm.

The LIFE Programme has been at the forefront of supporting efforts by municipalities and regions to take more sustainable transport actions. A sample of some of these LIFE projects is featured in this section.



THE EU'S AMBIENT AIR QUALITY DIRECTIVE

The EU's Ambient Air Quality Directive (2008/50/EC) consolidates existing legislation, establishes new objectives for concentrations of 'fine particles' (PM_{2.5}) and gives Member States more flexibility in meeting some existing air quality standards (PM₁₀, NO₂, SO₂ and benzene). Transport is confirmed as a significant source of particulate matter and local authorities are involved with implementing different types of environmental activity to monitor and manage air quality in compliance with the directive's requirements.

Photo: LIFE02 ENV/E/000253



nature on wheels
www.ecobus.info

LIFE helps LRAs in implementing sustainable mobility

A variety of LIFE projects have been carried out by local and regional authorities and their partners that successfully demonstrate how new approaches and innovative thinking can help produce sustainable mobility benefits for Europe's citizens, businesses and environment.

LIFE's portfolio of transport projects is already extensive and continues to expand as a growing number of local and regional authorities (LRAs) recognise the benefits available from using LIFE support for testing and demonstrating new ways to tackle transport challenges. Common areas for LIFE interventions by LRAs include mobility management, traffic monitoring and transport planning, low-emission vehicles, and abatement of traffic-related noise or air pollution.

MANAGING MOBILITY

Sustainable mobility is a high priority for Europe's local and regional authority transport stakeholders. A range of different LIFE projects have been involved with integrated transport actions that help contribute to targets for efficient and equitable transport systems that achieve a suitable balance between economic, environmental and social needs.

One such example can be found in the Italian town of Novara (LIFE02 ENV/IT/000106) where escalating traffic volumes had been creating significant noise and air quality problems. In response, the municipal authority devised a solution based around a 'Slow Mobility Plan'. The plan involved residents, businesses and visitors, who worked together with the local authority to reduce vehicle use, make greater use of public transport and lessen the town's overall ecological footprint. A 'Green Ray' zone was created with newly pedestrianised areas, cycle lanes, intelligent traffic lights and a fleet of low-emission buses.

The 'Make Brussels bicycle-friendly' project (LIFE98 ENV/B/000269) aimed to change attitudes to cycle use in the city, using four target groups as catalysts for action: the general public; schools; public authorities; and private companies. A plan to encourage these four groups to



Photo: LIFE02 ENV/IT/000106

Map of the area in Novara where the slow mobility plan was implemented to reduce air and noise pollution

cycle more was implemented, including a number of mass events for the general public. Most notable of these was 'Dring, Dring', which continues to this day as part of Brussels' Car Free Sunday, an annual event which bans motor vehicles from the city centre. By the end of the LIFE project period, there was a 20% increase in average bicycle use in Brussels. Although the LIFE project was a success, major investments in infrastructure and long-term funding by the local authority will be key to meeting the overall objective.

The 'Make Brussels bicycle-friendly' project organised a car free day, an event that continues to this day. The slogan reads: 'My other car is a bike!'



Photo: LIFE98 ENV/B/000269

TRAFFIC MONITORING AND MOBILITY PLANNING

Monitoring and analysing different transport user types is another important function of LRAs. The data they produce are vital for planning and managing environmentally-sustainable transport systems. LIFE has been used by LRAs and their partners to demonstrate new approaches for monitoring impacts on transport networks. One example that will be of widespread interest to local and regional authorities is Italy's Freeway

project (LIFE04 ENV/IT/000547).

Operated by the Bologna local authority, LIFE Freeway established a new method for monitoring the influence of traffic on air quality. A new 'homeostatic open traffic balancing' methodology was applied that gathered live data on mobility, environmental conditions, air pollution, road works and safety. These data were used to improve traffic flows and thus reduce pollution levels.

The project also produced guidelines for better mobility planning around big cities, such as the use of simple diversion signs that can also reduce queues and accidents.

SUSTAINABLE MOBILITY IN INDUSTRIAL AREAS

The Spanish GESMOPOLI project (LIFE05 ENV/E/000262) piloted a new approach to developing alternatives to the private car for people working on industrial estates. Co-operation between the regional public authority and businesses in the industrial estates was essential to the success of the project, which took place at six industrial sites near Barcelona. To this end, mobility committees involving business representatives from the different sites were set up. Their effectiveness was boosted by the presence of in-situ mobility managers who acted as neutral facilitators during the formation of new collaborative approaches between businesses on sustainable mobility issues. One such collaborative approach saw the signing of 'mobility pacts', which secured commitments beyond the three-years of the

LIFE project to GESMOPOLI's objectives. Another important outcome was the creation of a set of mobility manager guidelines that offer valuable advice for elsewhere in Europe.

RENEWABLES FUEL PUBLIC TRANSPORT

Two further Italian LIFE projects are currently showing how local, regional and other transport authorities can reduce their reliance on fossil fuels to power their public transport fleets. The ETRUSCAN project in Viterbo Province (LIFE08 ENV/IT/000425) is working towards introducing new environmentally-sensitive buses that run on a combination of biofuel and solar electricity.

Two biofuel production plants have been purchased by the local authority with financial assistance from LIFE.

Both plants convert used vegetable oil into biofuel and between them they produce enough fuel (approximately 1 500 litres/yr) to operate two new hybrid buses. Electricity for the buses will be generated by two photovoltaic electric sub-stations that recharge the bus batteries. Each solar power unit will generate 20 KWh of electricity for the new low-emission buses.

Results from this project are anticipated to shorten supply chain impacts associated with transporting fuel from producer to user. During a two year period the buses will operate for at least 460 days and carry some 20 000 passengers.

The MHyBus project in Emilia-Romagna (LIFE07 ENV/IT/000434) was launched in 2007 with the aim of founding the region's first hydro-methane bus service and also broadening the uptake of

GESMOPOLI set up a management system for sustainable mobility. Awareness raising activities were also carried out to encourage people working on industrial estates to change their behaviour

Photo: LIFE04 ENV/IT/000547



Photo: LIFE05 ENV/E/000262



Photo: LIFE04 ENV/IT/000547





Photo: LIFE06 ENV/D/000477

The PARFUM project combined innovative technologies for clean vehicles for city logistics and public transport, integrated with policy and planning approaches to improve urban air quality



similar technologies through regional policy measures. A preparatory study carried out for the regional government indicated that introducing alternative bus fuels (mixing hydrogen with natural gas) could significantly reduce CO₂ and other atmospheric polluting emissions.

The project is now adapting a vehicle that previously used natural gas as its main fuel source to run on a hydro-methane mix. Its performance will be carefully monitored to assess the potential for introducing this more climate-friendly technology throughout an entire municipal bus fleet.

CURTAILING NOISE NUISANCES

Transport-related noise nuisance represents a growing challenge for European LRAs and the SPAS project (LIFE06 ENV/A/000345) is just one of a number of LIFE projects that have been supporting regional authorities' efforts to tackle this issue (see page 11). In France, for example, the GIpSy-NOISE project (LIFE02 ENV/F/000295) produced a new IT tool to enable local planners and decision-makers to respond to the requirements of the EU Noise Directive (2002/49/EC).

Run by the municipality of Lyon and including partners from five other Member States, this project's novel

software demonstrated how existing data on traffic volumes, road surfaces and land use could be applied by municipal authorities to carry-out noise assessments. Information produced by the project was subsequently used to prepare noise reduction action plans.

In addition, the GIS component of GIpSyNOISE was able to identify traffic 'black spot' areas of high noise pollution and, by further cross-referencing transport noise sources with socio-economic data, the LIFE-funded tool was shown to be useful for integrating noise control considerations into the design of new town-planning projects.

LIFE has also helped local authorities to support various practical noise abatement actions that complement ICT planning tools such as the GIpSyNOISE technology. Such activity is illustrated well by a project from Graz (LIFE00 ENV/A/000240) in Austria where EU co-finance was used to implement a programme of noise reduction measures on the city's roads.

These included constructing speed calming works, raising public awareness about traffic noise levels and delivering a 'silent driver' programme that trained 350 taxi drivers and 210 bus drivers on how to reduce vehicle noise.

IMPROVING AIR QUALITY

Local and regional authorities also influence local air quality by regulating or restricting traffic use in specific areas. Planning controls offer another means of ensuring that potentially polluting or hazardous processes are not sited in residential or other protected areas. Many LIFE projects have tackled the issue of air pollution, such as the German PARFUM project (LIFE06 ENV/D/000477) which aimed to reduce problems caused by fine particles from freight and heavy duty vehicles in urban areas.

Air pollution from fine dust or particulate matter is mostly caused by road traffic, more specifically by re-suspension of road dust and exhaust emissions. These tiny particles represent a serious health risk since they are able to penetrate deep into the lungs, triggering not only respiratory diseases but also damaging the cardio-vascular system. LIFE PARFUM sought to reduce these health risks from particulate pollution by implementing and evaluating a combination of new approaches based around low-emission vehicles and public transport in Bremen.

Private sector partners, such as the courier company DHL, were involved in this project and parking incentives provided

by the local authority granted priority access in congested zones for low-emission delivery vehicles. New fuel supply facilities were also built to encourage increased use of natural gas engines. Conclusions from the Bremen pilot actions were compared with approaches adopted by cities in the Netherlands and Italy to extract common lessons and inform future air quality control options.

Another multi-national LIFE project active in this field is being led by transport managers from the Austrian municipal authority of Klagenfurt (see pages 12-14). This builds on the results of a previous LIFE project (SPAS - **LIFE06 ENV/A/000345**) which sought both to assess the potential of a new 'Sound and Particle Absorbing System' designed to treat particulate pollution as well as reduce noise problems around transport networks.

SPAS technology combined particulate filters within a sound barrier for absorbing traffic-related dust particles and sound. Using a road tunnel as a test site, the project effectively demonstrated how dust-filled air can be cleaned by special filter elements in sound barriers and in exhaust-air openings at tunnel entrances. Results from the LIFE project revealed useful reductions in both dust and noise pollution.

Co-operation between transport operators was acknowledged as an important success factor in the LIFE CEDM project that developed a 'Centre for Eco-Friendly City Freight Distribution' (**LIFE05 ENV/IT/000870**). The CEDM project was selected as one of the 17 "Best" LIFE Environment projects in 2008-2009 and its core objectives centred on tackling adverse effects from traffic congestion in the Italian city of Lucca.

CEDM's approach was sponsored by the local authority and featured the introduction of a new logistic base (known as a Transit Point), which is located with good access to the city's main transport network, but away from the historical centre of Lucca. Large freight is offloaded at the Transit Point and a fleet of smaller trucks (including low-emission vehicles) is used to deliver goods within the city centre. An ICT model co-ordinates all of the Transit



Photo: LIFE07 ENV/IT/000434

LIFE funding was used to create the first hydro-methane bus service for the Region of Emilia Romagna in Italy

Point's freight movements and results reduced petrol and diesel freight traffic in the city centre by as much as 66%.

Another LIFE project testing low-emission vehicles (in partnership with the local authority) was the IMMACULATE project in the Greek city of Thessaloniki (**LIFE02 ENV/GR/000359**). This sustainable mobility initiative achieved its goals by combining clean vehicle technologies (electric power-assisted bikes, electric scooters and hybrid passenger cars) with other innovations in urban transport, such as enhanced transport information; the use of management systems; smart-card technology; and mobility management schemes.

Finally, the LIFE Third Countries KALAIR project (**LIFE06 TCY/ROS/000269**), implemented by the environment agency of the City of Kaliningrad (ECAT) constructed a modelling system (ARIA REGIONAL) to study air pollution caused by traffic in the Russian exclave. The project team also investigated the impact of changes in fuel composition, improvements to vehicles, greater use of public transport and traffic flow management, including rights of way. By modelling future traffic scenarios, the municipality has been able to evaluate the merits of different strategies for reducing air pollution from traffic by 2015.

LIFE ROAD MAPS

This short sample of transport-related projects underlines the broad scope of LIFE support that can be harnessed by local and regional authorities for sustainable mobility initiatives.

LIFE co-finance in this area is available for infrastructure investments, demonstration vehicles, dedicated personnel, public awareness campaigns, capacity-building tools, and many more activities associated with rolling out successful road maps towards environmentally-sound transport systems.

Ecological freight distribution vehicles increased the efficiency of deliveries whilst cutting down pollution levels



Photo: LIFE05 ENV/IT/000870



Removing airborne particles is fine work for Klagenfurt

The Austrian KAPA GS project demonstrated how local authorities can lead the political change necessary to reduce the amount of fine particles in urban air. By measuring current levels and both monitoring and projecting future levels, authorities can generate the public awareness and political support necessary to reduce city traffic, clean public transport systems and improve street cleaning.

Fine particles in the air are an unseen environmental hazard. Particles so small that they cannot be seen by the naked eye are nevertheless linked with human health conditions including respiratory problems, heart disease and lung cancer. They are a particular danger in urban environments where large quantities of tiny, solid particles are created by

motor vehicles, domestic fuel burning, industry and construction.

The LIFE KAPA GS project was an Anti-PM10 Action programme led by the city of Klagenfurt, southern Austria, in co-operation with Graz and South Tyrol. PM10 is particulate matter smaller than 10 micrometres (μm). The three partner

local authorities all experienced levels of PM10 which exceeded the European Air Quality Directive's recommended threshold value of $50 \mu\text{g}/\text{m}^3$ on more than 35 days during the six winter months.

A major obstacle to improving this situation was that people literally could not see the problem. Klagenfurt had only two monitoring stations for particle pollution and politically, there was little interest in the subject. The LIFE project sought to improve understanding of the issue and demonstrate methods for reducing concentrations of both PM10 and the smaller PM2.5.

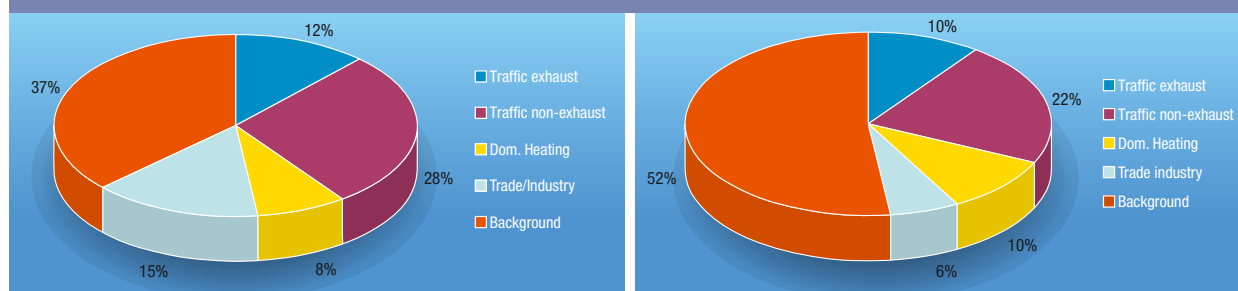
Klagenfurt municipal authority employees used the city's 'car free day' to inform the public about the problem of PM 10 and about the LIFE KAPA GS project



MODELLING THE PROBLEM

The LIFE project manager, Wolfgang Hafner of the Environmental Department of Klagenfurt, realised that technical solu-

Figure 1: Sources of air pollution in two hotspots in Klagenfurt



tions alone would not lead to change. “To get political agreement on measures to tackle the pollution, the most important part was demonstrating and raising the visibility of the problem to the public.” In the first instance, this meant measuring the problem, following the old adage that what cannot be measured remains invisible.

The Technical University of Graz (TU-Graz) had already worked on a small-scale modelling system for monitoring the particles generated by isolated projects, such as the construction of a new shopping centre. As part of the KAPA GS project, TU-Graz developed its methodology to be applied at the level of the whole city. “At the start of the project we were not at all sure that it would be feasible to use the modelling at such a scale,” admits Mr Hafner.

However, improvements in computing technology meant that it was now possible to run the necessary programmes to produce air quality maps of the city at a resolution of 10m x 10m. “No such detail existed before,” highlights project assistant Sandra Habib. “Now it was possible to show clearly to everyone, not only that a problem existed, but where it was most important.” The air quality maps for Klagenfurt and Graz were shown at press conferences, in meetings with politicians and to local community groups.

The modelling work took place at the same time as extensive air quality monitoring. Klagenfurt developed a network of 12 monitoring stations providing real-time data on levels of PM10 and PM2.5. In this way it was possible throughout the project to compare the models with the real situation and provide ‘now-casting’ of pollution levels.

The sensors detected particle levels in the air. As Dietmar Oettl of the Regional Government of Styria explains, they also provided for the first time “a detailed analysis of the major contributors to the current PM10 levels.” One of the key findings was that traffic-related particles not coming from vehicle exhausts – i.e. those coming from road dust and those released by tyres and brakes – were the most important single source of PM10 and that as much as 52% of particulate matter came from background sources in Klagenfurt, versus 37% in Graz (see figure 1).

The modelling system developed by TU-Graz made it possible to run projections, for example, to predict what the levels of particulate pollution would be on the following day based on today’s data. Of particular interest for local and regional authorities, it was also possible to make predictions on the impact of different policy changes by running the scenario through the forecasting model.

REDUCING CITY CENTRE TRAFFIC

Several actions were taken in co-operation with a range of stakeholders that would not have been possible without the support generated by the pollution mapping and awareness-raising actions.

A first measure to reduce road traffic in the city centre – where particulate matter was at its highest – was to close certain roads to through-traffic. This was extremely sensitive politically and required a significant media campaign, which included a major “Fine! Dust-Free” event in Klagenfurt and local buses carrying the same message. A further measure in this regard was the installation of eight electronic information boards in

Klagenfurt reporting particle levels for the previous three days as well as other project information.

Road closures were successfully introduced as a two-month trial during the first winter and a six-month extension in the second winter. Only residents, buses, taxis and vehicles with business in the centre could enter the roads. Obtaining the regional law to implement the road closures was relatively easy, but implementing the scheme had to be done sensitively. Mr Hafner describes the process: “For the first year or so, the police did not fine people. They just informed them of the ban. Now, as people have got used to the changes, the ban is fully enforced all-year round.”

Another measure was the introduction of a free park-and-ride system. Some 1 000 people/day used the service, with peak numbers of around 1 600. However, an initiative to persuade shopkeepers to pay for bus tickets for their customers did not work as well as hoped and was abandoned when only 15 000 of the 100 000 bus tickets had been distributed. This shows the importance of ensuring full engagement in new endeavours by relevant stakeholders.

Electronic information boards reporting particle levels





The "Fine! Dust-Free" event proposed alternative modes of city transport

OTHER POLLUTION-REDUCING MEASURES

The high level of non-exhaust vehicle-related pollution in Klagenfurt (Figure 1) showed that a major cause of particle pollution was re-suspension of particles from road surfaces. Evidence from the project convinced the road maintenance department to invest in new road sweepers in conjunction with the private company, MUT. The sweepers bind surface particles to prevent them escaping back into the atmosphere. TU-Graz calculates that the new machine generates 50% fewer re-suspended particles than the previous system.

The project used test roads in each partner city to investigate whether the use of calcium-magnesium-acetate (CMA) could improve the binding of fine particles for subsequent sweeping. The tests showed good results for reducing PM10, however drivers complained of slippery road conditions. These findings led the City of

Klagenfurt to apply for a subsequent LIFE project CMA+ (LIFE07 ENV/A/000003) to conduct further testing of this promising methodology.

The local authority was also able to convince public transport organisations to improve the performance of their buses. PM-catalytic converters were successfully added to 114 buses in Graz and filters added to 15 buses in Klagenfurt. The filters were more successful, reducing PM10 by more than 90%. However, they are relatively expensive and require replacement after two years. Mr. Heinz Koch, Stadtwerke Klagenfurt (infrastructure and services company), argues that the long-term solution remains the introduction of a new generation of cleaner buses.

Finally, given the PM10 originating from domestic heating systems, the City Authority of Klagenfurt and the regional government agreed to provide subsidies to connect apartment blocks to district heating supplies. In 2005-6, 81 buildings were

converted from oil or individual heaters to the district heating system, while 20 buildings switched to the cleaner natural gas. A further 617 individual residences were connected to the district heating system.

Looking to the future, the tools developed by KAPA GS continue to be used in the partner cities to plan or assess PM10 reduction measures. The system has since been further developed by TU-Graz and is now being applied in the cities of Vienna and Linz as well. The municipal authorities in Klagenfurt continue to lead the way in efforts to reduce fine air pollution (and also noise), through two further LIFE Environment projects, the recently completed SPAS – Sound and Particle Absorbing System (LIFE06 ENV/A/000345) and CEMOBIL (LIFE09/ENV/AT/000226) which aims to reduce air pollution by increasing the share of electric vehicles to 10% of all new registrations.

While KAPA GS successfully demonstrated a series of practical measures for reducing PM levels in the urban atmosphere, Mr. Hafner is clear that the major success of this LIFE project was providing the evidence to bring about political change. "The main lesson is that it is possible to reduce PM levels without additional funds. It just needs the political will and a change of priorities."

Innovative street-sweeping vehicles bind surface particles to prevent them escaping into the atmosphere



AUSTRIA

Project number: LIFE04 ENV/AT/000006

Title: KAPA GS – Klagenfurt's Anti-PM 10 Action Programme in co-operation with Graz and the South Tyrol

Beneficiary: City of Klagenfurt

Contact: Wolfgang Hafner

Email: wolfgang.hafner@klagenfurt.at

Website: www.feinstaubfrei.at

Period: Jul-2004 to Sept-2007

Total budget: €4 059 000

LIFE contribution: €1 826 000



→ *Waste management & local/regional authorities*



Photo: LIFE99 TCY/CY/0004-1

The EU generates an estimated 3 billion tonnes/yr of waste. This includes waste from manufacturing, energy production and water supply, from the construction sector and municipal waste. In addition, significant amounts of waste are produced by agriculture, forestry, fishery, mining, quarrying, and the service and public sectors¹. Local and regional authorities face many challenging issues when implementing EU legislation on waste.

¹ EU Waste Policy – The Story behind the Strategy http://ec.europa.eu/environment/waste/pdf/story_book.pdf

Local and regional authorities managing waste issues

As stated by the Council of European Municipalities and Regions (CEMR), local and regional authorities (LRAs) are “heavily and increasingly involved in the management of waste.”¹

Successful waste prevention requires a co-ordinated approach, involving both local and regional authorities, as well as national and EU-level institutions. It is necessary to determine a harmonised approach to lifecycle analysis that can fine tune the waste hierarchy. This harmonised approach, together with common objectives and indica-

tors, would enable LRAs to monitor the achievements of waste prevention programmes.

WASTE PREVENTION AND RESOURCE EFFICIENCY

LRAs are important actors in relation to waste prevention at source because they are able to link citizens to producers and also to educate citizens about individual waste management. (e.g. recycling, bio-waste etc). Furthermore, as significant consumers themselves, they can provide a model and influence the development of new markets for green products. However, LRAs need guidelines and an exchange of information and best practice on waste prevention, recycling and

resource efficiency in order to direct them in adopting the best tailored solutions.

RECOVERING VALUABLE RESOURCES

Waste may be considered as a secondary raw material because it comprises materials that can be recovered and transformed to produce new products. The main issue that is at stake for local authorities is to know clearly and reliably the origin, amount and type of waste they will be responsible for in the forthcoming 10-30 years in order to plan the required treatment capacity. This certainty is vital, especially in cases of joint planning with the private sector for treatment capacity across waste sectors.

¹ Position of the Council of European Municipalities and Regions on the Proposal for a European directive on waste http://www.ccre.org/prises_de_positions_detail_en.htm?ID=67

LRA also face challenges concerning the methods used for selective collection in order to reach EU recycling targets. Changes to collection practices should be accompanied by information campaigns that act as a driver towards changing consumer demand. However, it is not always evident how to inform, educate and encourage public participation. All of these actions must also be accompanied by the creation of a strong internal market for recovered and recycled products; therefore, LRAs feel that it is necessary to set common quality standards for these products.

While recycling targets are essential, they must represent a realistic ambition and be determined in co-operation with all stakeholders - local and regional authorities have to find ways to co-operate with all actors in the recycling chain at a later stage.

Finally, LRAs also need clearer information on the efficacy of economic, legal and voluntary instruments that promote waste prevention and recycling and their role in providing an incentive for behavioural change.

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

LRAs contribute directly, or through contractors, to the collection of WEEE. The choice of method of separate collection - be it at the doorstep or at collection facilities - depends on local circumstances. The challenge LRAs are faced with is to unburden themselves from the administrative and financial consequences of the WEEE Directive by strengthening the producer responsibility principle.

If EEE producers were to be fully responsible, collection services could be provided for free to citizens and this would also lead to higher awareness amongst consumers and higher levels of collection².

BIOWASTE

LRAs need certainty about the rules that are to be applied to biowaste management in order to help inform decisions

² CEMR position paper on the recast of the proposal for a directive on waste electrical and electronic equipment (WEEE)
http://www.ccre.org/docs/weee_en.pdf



EUROPEAN UNION POLICY AND LEGISLATION ON SPECIFIC WASTE STREAMS

- Waste Framework Directive (2008/98/EC)
- Directive 2006/21/EC on the management of waste from the extractive industries
- Regulation on shipments of waste (1013/2006/EC)
- Directive on batteries and accumulators containing certain dangerous substances (91/157/EEC)
- Directive on packaging and packaging waste (94/62/EC)
- Directive on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT) (96/59/EC)
- Directive on end-of life vehicles (2000/53/EC)
- Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (2002/95/EC)
- Directive on waste electrical and electronic equipment (WEEE) (2002/96/EC)
- Communication from the Commission on future steps in bio-waste management in the European Union - COM(2010)235 final

on investments and policy choices. LRAs have to mediate between different priorities whilst being financially constrained. "Understanding the financial dimension of biowaste management" is also essential, says CEMR³.

Biowaste management has a strong local dimension and so there is a general understanding amongst LRAs that there is no one "best" option for its treatment. This also means that they believe that Member States and local governments should have a great deal of flexibility in identifying the management methods that are most

suitable to local conditions (i.e. treatment options, increasing recycling and improving energy recovery). LRAs believe that soft measures (i.e. sharing information on local initiatives and data; support for local and regional know-how) should be adopted.

CONCLUSION

Local authorities need a platform for the exchange of know-how, waste management methods and best practice, whether for waste prevention and recycling, WEEE or biowaste. The following pages contain an array of successful LIFE projects that local and regional authorities have implemented, as beneficiaries or as partners, that can be used as examples of best practice methods in waste management, waste prevention and recycling, co-operation with stakeholders and awareness-raising.

³ CEMR response to the Green paper on the management of biowaste in the European Union http://www.ccre.org/docs/cemr_position_green_paper_biowaste_march_2009_final.pdf

Local and regional authorities play a fundamental role in informing, educating and encouraging public participation in waste prevention and recycling



Photo: LIFE03 ENV/F/000260

Many local and regional authorities (LRAs) have benefited from LIFE funding to demonstrate innovative methods for waste management, creating public-private partnerships and raising awareness all over Europe.

LIFE and LRAs pioneer **new approaches to waste management**



Photo: LIFE04 ENV/DE/000056

The ZAK waste treatment process produced a high level of secondary combustible material, less amounts of waste for landfilling and showed that the recyclable wastes produced had significant commercial potential

Since 1992, Europe's LRAs have successfully developed 118 LIFE projects tackling waste management. This chapter features a selection of projects that can provide best practice examples to municipalities and regions across the EU as they seek to implement waste management strategies, organise awareness activities amongst citizens and stakeholders and develop innovative technologies with enterprises for waste recycling.

WASTE PREVENTION SOLUTIONS

As often stated, waste prevention is frequently best achieved at local and regional levels. LRAs are in the best position to define effective waste prevention schemes that ensure participation and acceptance at the local level.

The ongoing Waste Objective Campaign project (LIFE08 INF/E/000187)

aims to promote the concept of the 'European recycling society' in the Barcelona Metropolitan Area. The project is using innovative marketing techniques (such as social networks, YouTube and interactive games) as well as traditional dissemination activities (e.g. seminars) to increase citizens' awareness. The project's goal is to increase the separate collection rate from 31% to 40% and the amount of waste being treated from 52% to 90%.

The Ideal 79 project (**LIFE05 ENV/F/000063**) - a Best LIFE Environment project winner 2008-2009 - led by the Communauté d'Agglomération de Niort, understood the necessity of creating a market for eco-products and eco-services. It did this by distributing an eco-consumer's guide among 160 000 households, along with 69 price reduction vouchers for 119 eco-products and an IDEAL shopping list of products that reduce the toxicity and quantity of waste. The local authority also distributed a guide listing 500 companies specialised in the repair and re-use of products. Furthermore, 3 451 compost facilities were given to households and a Corporate Commitment Charter was signed by 125 stakeholders committing themselves to waste prevention

RE-USE, CO-OPERATION AND SEPARATION

Inter-regional co-operation can make a positive contribution to policy development and technical capabilities for waste management among Europe's LRAs.

The Kalamata Waste project (**LIFE98 ENV/GR/000211**) involved a highly beneficial partnership between the Greek municipality of Kalamata and the German Landkreis Aurich. The German partners acted as consultants ready not only to transfer their experience and know-how but also to work together with the Greek beneficiary to identify specific problems and potential solutions in developing an integrated waste management and recycling system. The project covered all municipal solid waste (MSW) streams and succeeded in increasing recycling rates in Kalamata. After having studied the composition of MSW and its variants - it is essential to know the origin, amount and type of waste to determine the treatment facility - the municipality then proceeded to implement different separation schemes for household waste, hazardous household waste, and special waste (i.e. bulk, slaughterhouse, construction and demolition, batteries, solvents and medical waste).

The ZAK project (**LIFE04 ENV/DE/000056**) implemented a waste treatment plant that produced more sec-



Photo: LIFE05 ENV/F/000063

The IDEAL 79 project understood the necessity of creating a market for eco-products and eco-services and raised awareness amongst nine families on buying eco-products that reduced the amount of waste they generated

ondary combustible material and sent less waste to landfill than conventional mechanical/biological treatment. The recyclable wastes produced have a high potential for commercialisation. Use of the ZAK process at the beneficiary's site in Kahlenberg, Germany has saved 50 000 tonnes/yr of CO₂ emissions (equivalent to the average annual emissions of 32 000 cars).

The Rcycl project (**LIFE99 ENV/B/000640**) developed a re-use and recycling scheme for bulky waste in seven municipalities in Belgium's German-speaking community. The beneficiary

Innovative Construction Regulations and CDW Collection System Regulations were adopted thanks to the REAGIR project



Photo: LIFE03 ENV/P/000506

established a public-private partnership to enable a flexible and (mostly) free bulky waste collection service to the public all-year round. As a result, bulky waste collection increased from 88 tonnes in 2000 to 850 tonnes in 2002. Some 10% of the collected waste could be re-used and 70% recycled, thus preventing 500 tonnes of waste being sent to landfill or incineration.

EXTENDING PLASTIC'S SHELF LIFE

Recycling of plastics is complicated and involves high costs because selection has to be done manually, thus making it a more expensive option than incineration. However, 30% of domestic waste is plastic. Mechanical recycling can only be carried out efficiently if the plastic materials are prepared in mono-material groups of identical molecular structure. This segregation has been proven to be viable but only for large pieces (heavier than 10 grammes, such as bottles). The real challenge is to obtain high recycling rates in the treatment of small and dirty pieces, which make up an estimated 70-80% of the total solid waste.

Through the AUTOREWASTE project (**LIFE02 ENV/E/000269**), the municipality of Alcázar de San Juan, with the

collaboration of its partners, developed a microchip labelling system that can identify and select plastic waste according to its chemical composition (PET, PVC, POLYVINYL, etc.) and which is compatible with existing plastics sorting facilities.

RECYCLING CONSTRUCTION AND DEMOLITION WASTE (CDW)

The Waste Framework Directive (2008/98/EC) requires that Member States adopt measures to re-use, recover or recycle CDW in order to achieve a reduction of 70% in weight by 2020. As the operators of CDW management schemes, local and regional authorities have an important role to play in achieving this target.

The LIFE REAGIR project (**LIFE03 ENV/P/000506**) – a Best LIFE Environment project 2008-2009 – was led by the Municipality of Montemor-o-Novo, which succeeded in engaging 61% of all local CDW producers in a recycling scheme. A new collection system allowed waste to be separated at source, providing the inert fraction for recycling. A pilot recycling unit producing broken stone and other construction materials was successfully installed and, during the 16 months of operation, 3 976 tonnes of waste was used to provide 3 690 tonnes of usable aggregates. Some 16 000 paving blocks and 420 kerb stones were produced, using only 20% of the recycled aggregates.

As a result of the project, Montemor-o-Novo adopted groundbreaking local regulations ahead of Portugal's national

LIFE funding was used to produce three compost types by mixing different ratios of organic waste



Photo: LIFE03 ENV/P/000506

Thanks to the REAGIR project 3 976 tonnes of waste was used to provide 3 690 tonnes of usable aggregates. A total of 20% of these aggregates were used to produce some 16 000 paving blocks and 420 kerb stones

law, and handlers of CDW were obliged to obtain a CDW Management Certificate. The municipality closed 20 illegal CDW dumps during the course of the project and has significantly reduced the incidence of illegal-dumping (only two such dumps exist today).

COMPOSTING TECHNIQUES FOR HOUSEHOLD BIOWASTE

Miniwaste (**LIFE08 ENV/F/000486**) is a transnational project that aims to reduce the amount of organic waste from households in Rennes Metropole (France), Lipor (Portugal) and Brno (Czech Republic). This will be achieved by disseminating best practices on reducing food waste and encouraging composting of biowaste within households. The project will also compare the efficiency of different composting technologies.

As part of the project, Rennes Metropole is developing monitoring protocols to assess whether or not the compost produced is compliant with EU standards. The French city is seeking to involve 50% of the population living in detached houses and 25% of those living in collective buildings, with the objective of reducing biowaste by 80%.

The Regional Authority of Andalusia, through the COMPOSTDISSEMINATION project (**LIFE00 ENV/E/000543**) showed that 'co-composting' and joint composting of biowaste is technically and economically feasible. The compost was processed at two plants and was then

tested as humus in gardening, landscaping and afforestation. The project successfully mixed different ratios of organic waste to produce three compost types using a simple and cost-effective system. The incorporation of chipped bark and garden trimmings allowed for better aeration during fermentation. This, coupled with the strict composting conditions, generated a stable, hygienic end product of high quality. Additionally, a new compost-spreader was designed to automatically self-level, while spreading the material on terrain with slopes of up to 17%. COMPOSTDISSEMINATION was a Best LIFE Environment project 2004-2005.

LRAs often lack knowledge of the most effective ways to organise separate collection of biowaste and about cost-effective home composting. The National Technical University of Athens wanted to provide this information to the local authorities that were partners in the COMWASTE project (**LIFE03 ENV/GR/000205**), as well as to LRAs in general.

After a careful evaluation of all composting systems on the market, the project produced 100 prototypes of a simultaneous biowaste collection and composting system, 90 of which were distributed to selected households, who were trained to use it. Zeolite was added to biodegradable household kitchen waste to eliminate odours and improve the quality of the final compost. Lab analysis indicates that this compost meets standards for safe use.



Photo: LIFE00 ENV/E/000543

COMWASTE also developed a framework of guidelines and specifications for the implementation of the programme on a larger scale and supplied this to local authorities.

In Latvia, the Bio Waste project (**LIFE03 ENV/LV/000448**) ran full-scale tests of two different composting technologies - open-air composting in piles or stacks; and a two-stage process using a bioreactor followed by secondary composting in stacks. This second method was found to produce a high quality compost suitable for use in gardens and fields. Results showed that open-air methods produced a low quality compost, but one which can be used as safe landfill covering material. Calculations of composting prices provided by the project show that open-air composting is cheaper than other bio-treatment methods (€10 per tonne) as opposed to the cost of disposal in new sanitary landfills (around €15 per tonne).

E-WASTE RECOVERY, RE-USE AND RECYCLING

LRAs have been involved as partners and beneficiaries in LIFE projects that have dealt with the issue of the collection of waste electrical and electronic equipment (WEEE) and the extension of the EEE life cycle through repair, re-use or recycling.

The PC-NEW project (**LIFE00 ENV/E/000484**) saw 13 municipalities in Catalonia collaborate with two business federations (actively involving 137 companies) to introduce a process for recycling PCs and their accessories. The project set up a system for the collection and recovery of obsolete computers and IT equipment from administrative bodies, companies and private individuals. The machines were repaired and equipped with recycled components. The dismantling and subsequent recycling was done with strict quality control to enable clean new products to be produced, minimising effluent discharge and preventing pollution at source. Careful waste management of unusable parts also led to a reduction in environmental impact. The project collected a total of 2 373 computers, 2 030 monitors and 1 022 other items



Photo: LIFE03 ENV/LV/000448

The turning of windrows mixes the composting materials and enhances passive aeration

(printers, scanners, etc.), from which 669 computers were produced and donated to social groups.

The Municipality of Nea Smyrne (Greece) was a partner in the Sumaneweg project (**LIFE00 ENV/GR/000688**) and helped in raising awareness and setting up a WEEE collection system. The municipality also participated in forums along with producers, manufacturers, dealers and large-scale users with the aim of signing voluntary agreements to improve producer responsibility (the project started before the adoption of the WEEE Directive) and to ensure environmentally sound handling of this type of waste. The project diverted 73 tonnes of WEEE from the waste stream and produced an economic impact study on the sustainable management of e-waste in Greece and a code of good practices.

Led by Dublin City Council, the HEATSUN project, (**LIFE00 ENV/IRL/000764**) adopted an innovative model for the re-use, recovery and recycling of IT equipment through the creation of a permanent partnership of public, private and non-government sectors. The project set up six waste IT collection points as well as several hundred private collections, re-used 600 computers and recycled 26 000 that would have otherwise gone to landfill. The project coincided with the implementation of the WEEE

Directive into Irish law and had a significant input in the process. HEATSUN also helped job creation and generated social inclusion in the region by establishing SwiTch – a non-profit social economy enterprise – which developed a business plan that took into account the introduction of the WEEE Directive and has provided work for more than 20 people.

Another positive aspect of the project was the creation of a prototype of an “ecological computer” by the partner company, MicroPro, an SME that manufactures and repairs PCs. This waste and energy reducing design has applied for an EU eco-label.

HEATSUN created a prototype of an ecological computer



Photo: LIFE00 ENV/IRL/000764

LIFE encourages **waste prevention** in **Finland**

The EU has placed waste prevention at the top of its waste hierarchy. Local and regional authorities have a major role to play in influencing the behaviour of consumers to prevent waste. The LIFE WastePrevKit project saw Helsinki Region Environmental Services Authority disseminate best practice models on waste prevention to schools, households, public administrations and enterprises with the overall aim of reducing waste in the municipalities of Helsinki, Espoo, Vantaa and Kauniainen.



The WastePrevKit project provided the community with information on smart ways to avoid wasting food

The Helsinki Region Environmental Services Authority (HSY, formerly Helsinki Metropolitan Area Council - YTV) had already implemented some actions to raise awareness on waste prevention. However, WastePrevKit project manager Riitta-Liisa Hahtala says: "Waste prevention is a problematic subject. It is one thing to inform citizens how to separate and recycle their waste, it is another thing to tell people that they should change their consumer habits (i.e. avoid packaging, waste less food). You enter their private sphere and have to influence their personal choices."

HSY decided to develop the WastePrevKit project using LIFE funding in order to take waste prevention measures to a higher level, influencing a larger number of citizens under its territorial competence. The project led the authority to develop a wide range of waste prevention tools, ranging from teaching materials, to guidelines and best practices for households, businesses and public administrations, to the waste benchmarking service, Petra (see the "It's smart with less waste" web pages for more information: <http://www.hsy.fi/en/fiksu/Pages/default.aspx>).

In addition to standard communications activities, the beneficiary ran two special information campaigns, one on reducing waste over the Christmas period ("give an immaterial gift"), the other on preventing food waste ("less food wasted means more money in your wallet"). "The difficulty was trying to make these campaigns attractive to the general public," recalls Ms. Hahtala. "People won't make time for listening to waste issues unless you find a fun way to convey the message. This was one of our challenges." Linking the information campaigns to village winter events was

another way HSY tried to make waste prevention more interesting.

SCHOOLS HELP WITH WASTE REDUCTION

“Smart Teaching Materials” for all school-age groups (nursery, primary and secondary) were created and disseminated to schools and day-care centres within the catchment of HSY via the National Education Board, reaching more than 3 000 teachers. Vocational colleges were also targeted. The teaching materials varied from games and stories for nursery and primary schools to maths and physics problems on waste prevention for secondary schools. Feedback and ideas from the teachers and pupils using the materials (in the first academic year) were taken onboard by HSY and the materials were adapted and updated as a result. HSY is now working out how best place all the teaching materials and best to practice information on the virtual teaching platforms. The schools will be able to adapt them, altering the WastePrevKit tools to match their teaching needs.

“The positive aspect is that the schools we contacted have adopted the waste issues in everyday teaching and did not apply the methods only passively by giving ad hoc lessons on waste prevention,” says HSY’s environmental expert Sari Kemppainen. “In this way, waste prevention becomes part of their daily way of thinking and teaching as it is touched on in several subjects.”

PETRA GOES TO WORK

WastePrevKit produced models – mainly instructions and check lists – to help businesses and public administrations monitor and reduce the amount of waste that they generate. It also used and developed Petra, an online waste benchmarking service. This lets organisations provide annual data on the amount of waste they generate and provides a comparison with other organisations operating in the same field. More than 650 workplaces provided Petra with data in 2006.



The Helsinki Region Environmental Services Authority developed waste prevention toolkits for schools, households and workplaces

The benchmarking service has had a clear role in waste prevention: offices taking part reduced waste per employee by some 70 kg between 2005 and 2008, while grocery stores cut waste by

c.180 kg per employee over the same period. Each year, one Petra participant is awarded the title of “saver of natural resources”. (See box – waste prevention a winner for lottery company).



ONE HOUSEHOLD'S EXPERIENCE

Residents Mirva Merimaa and her husband Antti Kuivalainen took an active part in the Viikki-Latokartano campaign. An expert from HSY came to explain the methods to adopt for waste reduction and the couple were given guidelines. “We weighed the bags of waste (organic, plastic, paper) and kept a diary. At the end of the year we had reduced the amount by 33%,” says Ms. Merimaa.

“At first it was quite a struggle following the instructions to “waste less food”: we had to change the way we thought and bought! We bought less, asking ourselves if we really were going to eat all that food, or products in bigger cartons and pots so as to reduce waste packaging, buying better quality products that will last longer,” she explains. At first the family found that this new way of thinking took up a lot of their time, but eventually it became automatic. “It was also very surprising to see how little waste we could produce, after separation,” recalls Mr. Kuivalainen. However, he says that “eliminating packaging waste is more difficult as there is not enough choice in shops and supermarkets.”

Ms. Merimaa found that participating in the project brought on new ideas. In the “waste” room of their apartment building they have now put up shelves where the residents can place things they no longer need (toys, clothes, electrical appliances, magazines) for anyone else to pick up. “One person’s waste becomes someone else’s product.”

SMART WAYS FOR HOUSEHOLDS

One innovative aspect of the LIFE project was the development of a pilot action involving people in the residential area of Viikki-Latokartano. "Everybody living in the metropolitan area influences waste amounts through their daily choices" says Ms. Hahtala. "At home, each person generates approximately 300 kg of waste per year and nearly the same amount in their workplaces and leisure activities."

Guidebooks on waste prevention were delivered to every household in the pilot area and 14 families participated actively by keeping a diary of the amount of waste they produced. These families regularly weighed the waste they produced and, on average, they reduced mixed waste by 9% and biowaste by 22%.

HSY also used questionnaires to assess the effectiveness of its waste prevention campaigns. Results indicated that at least 70% of people in the Viikki-Latokartano area had heard of the LIFE project

Poster from the "Less food wasted means more money in your wallet" campaign



WASTE PREVENTION A WINNER FOR LOTTERY COMPANY

The Finnish lottery company Veikkaus Oy won the Petra "Saver of Natural Resources" award in 2009 for its waste prevention efforts, which included changing its mixed waste bins to energy waste bins, giving up paper cups, replacing paper hand towels, switching to double-sided printing and holding a 'paper free day'. "We managed to decrease the amount of waste produced (proportional to our number of employees) by 30% between 2003 and 2008. Now only 1% of the amount of waste it goes to landfill," says Eeva Karppanen of the firm's voluntary green team. Veikkaus has also cut its waste tax bill as a result. "I was very proud [when we won the award] and my colleagues suddenly understood why they had been making so many efforts in separating and preventing waste at work," says Ms. Karppanen. The enthusiasm continues and given the positive effects of the collaboration with the LIFE funded project, the company is now adopting its own long-term environmental strategy.

tano area had heard of the LIFE project and 56% had actively implemented some waste prevention actions. Barriers to waste prevention cited by inhabitants included the lack of availability in shops of products with less packaging and the expense of repairing goods in comparison with buying new products.

THE IMPACT ON WASTE AND LESSONS FROM LIFE

The WastePrevKit project succeeded in meeting the EU objective that waste generated will not increase at the same pace as the gross national product (GNP). Between 2004 and 2006, the overall amount of waste in the catchment area of HSY decreased from 7.4 tonnes of waste per million euros of GNP to 6.9 tonnes/million euros GNP. However, whilst mixed waste per inhabitant and waste per employee fell, total household waste rose from 328 to 336 kg/inhabitant.

"The WASTEPrevKit project has been so important," says Ms. Kempainen. "It helped us to create precious collaborations with the stakeholders that are now actively involved in waste prevention." HSY is building upon this experience by contacting more schools and households and by creating best practice models for other work places. It is also collaborating with the main hospitals in the Helsinki region and has developed best practice material for the healthcare sector.

"It is difficult to demonstrate that waste prevention is important, but after this project we are wiser," believes Ms. Kempainen. LRAs have limited scope for action and "good co-operation" is important. "[They] are not in a position to dictate rules on taxation or production, for example, they have to involve the community using a variety of persuasive methods. We found that the people are interested in the environment and that they are willing to act."



FINLAND

Project number: LIFE05 ENV/FIN/000539

Title: WASTEPrevKit - Waste Prevention Kit for enterprises, education and households

Beneficiary: Helsinki Region Environmental Services Authority (HSY)

Contact: Riitta-liisa Hahtala

Email: Riitta-liisa.hahtala@hsy.fi

Website: <http://www.hsy.fi/en/fiksu/Pages/default.aspx>

Period: Jan-2005 to Feb-2008

Total budget: €1 078 000

LIFE contribution: €539 000



→ *Climate change* *& local/regional authorities*



Local and regional action on climate change

Local and regional authorities (LRAs) are in the front line in the battle against climate change. Over the years, they have implemented a multitude of actions both contributing to mitigation efforts and dealing with the impacts of climate change.

Climate change is now recognised as one of the greatest threats facing mankind. Since the middle of the 19th century, average global temperatures have increased by around 0.8°C. This is already causing glaciers, ice sheets and sea ice to melt, sea levels to rise, a change in precipitation patterns, and an increase in the intensity and frequency of extreme weather events, such as floods, droughts and heat waves, in many regions.

To avoid even greater and irreversible impacts on society and ecosystems, international efforts are now focused on the urgent need to stabilise the climate below a 2°C increase by 2020 (compared to 1990 levels). This is an enormous challenge, which requires a significant reduction in global greenhouse gas (GHG) emissions, as well as concerted actions to adapt to the unavoidable impacts.

International agreements under the United Nations Framework Convention on Climate Change establish a frame-



work for strategies at European and national level (see box). However, the implementation of these strategies is mostly at sub-national level, where the efforts of local and regional authorities (LRAs) are essential to their success.

FROM POLICY TO ACTION

With responsibility for areas such as land use planning, infrastructure, energy efficiency and decentralised production of

renewable energy, public transport, public procurement and waste and water management, LRAs are the first line of defence in terms of dealing with many of the impacts of climate change, and are at the forefront of efforts to reduce GHG emissions. Some of the areas where LRAs have a key role to play are mentioned in the table below.

LRAs also have an important leadership role in terms of raising awareness about

Mitigation	Adaptation
Green public procurement supporting the market for green products and services	Risk assessment and climate change response planning
Introducing sustainable modes of transport	Management of risks to buildings and infrastructure
Promoting improved energy performance of buildings	Flood risk management
Planning for sustainable development (e.g. reducing commuting)	Management of water supplies
Promoting education on climate change and sustainable development	Management of coastal erosion
Promoting local renewable energy projects	Enhancing the resilience of species and habitats through nature conservation actions
Development of green space and carbon sinks	Ensuring healthcare services are prepared to deal with health risks arising from heat waves or new vector-borne diseases
Promoting and encouraging more sustainable patterns of behaviour among citizens and businesses	Preparing for and facilitating the integration of migrants from areas worst affected by climate change



climate change and in fostering behavioural change within their communities, targeting citizens and the private sector. They understand that the fight against climate change requires a collective approach and they provide impetus for local actors to take action, through incentives, awareness raising, targeted campaigns or support for local initiatives.

CHALLENGES AND OPPORTUNITIES

LRAs across the EU are already very active in many of these areas. However, efforts to meet, or even go beyond EU and national targets, are being undermined by a lack of information, resources and an appropriate support framework.

In its report on the “Impacts of Europe’s changing climate (2008)”, the European Environment Agency (EEA) highlights “a lack of information across Europe on impacts and vulnerability assessment at regional and local levels.” The EEA underlines the need for wider access to such information, as well as good practices in adaptation policies and approaches, which it says are “essential for assessing the risks and developing appropriate responses at local and regional level.”

The cost of implementing climate protection measures is also a major concern for many LRAs, and especially for smaller municipalities. In the context of budgetary tightening across the public sector, this situation is not likely to improve in the foreseeable future.

Despite these challenges, LRAs have been successful in demonstrating many different and often very innovative approaches to climate change mitigation and adaptation. In this section we look at some of these approaches, supported by co-funding from the LIFE programme, highlighting their potential for wider application through the EU.



LRAS AND CLIMATE CHANGE: THE LEGISLATIVE AND STRATEGIC FRAMEWORK

The Kyoto agreement (1997) requires the 15 countries that were EU members at the time to reduce their collective emissions to 8% below 1990 levels by 2008-2012. Similar targets have also been agreed with the 12 newer Member States. The EU is on track to achieve this goal, and at the end of 2008 legislation was finalised setting a further climate target: a 20% reduction in emissions by 2020, compared to 1990. A number of different EU strategies and laws contribute to achieving this objective. Many of these impact on the activities of LRAs, including:

Mitigation:

- Decision No 406/2009/EC on the effort of Member States to reduce greenhouse gas emissions to meet EU commitments up to 2020;
- Directive 2009/28/EC on the promotion of the use of energy from renewable sources sets a target of 20% of energy from renewable sources by 2020;
- Directive 2010/31/EU on the energy performance of buildings, which requires public buildings to work towards “nearly zero-energy” status;
- Directive 2009/31/EC on the geological storage of carbon dioxide.

Adaptation:

- Commission White paper (COM/2009/147) on “Adapting to Climate Change: Towards a European Framework for Action”;
- Directive 2007/60/EC on the assessment and management of flood risks;
- Directive 2000/60/EC, establishing a framework for Community action in the field of water policy;
- Commission Communication (COM(2007)308) on the evaluation of Integrated Coastal Zone Management (ICZM) in Europe.



SUPPORT NETWORKS

The Covenant of Mayors is a commitment by municipalities across Europe to reduce their CO₂ emissions, thus contributing to and going beyond the EU’s overall goal of 20% reduction by 2020. Started in 2008, by October 2010 the Covenant had more than 2 000 local authority signatories. (See www.eumayors.eu).

The United Nations Rio Earth Summit in 1992 produced the Framework Convention on Climate Change (UNFCCC) and Agenda 21, a blueprint for confronting the world’s environment and development problems. Chapter 28 of Agenda 21 specifically addresses the vital role of LRAs in achieving sustainable development. Via Local Agenda 21, LRAs in Europe have supported a sustainable energy economy. They have done so through energy savings and by applying new and existing renewable and highly efficiency technologies. Such technologies reduce dependence on fossil and nuclear fuels and aim for the lowest-carbon options. In Europe, the Sustainable Cities and Towns Campaign promotes co-operation between LRAs in implementing Agenda 21. The activities of the Campaign are governed by the Aalborg Charter+10, signed by over 2 500 local governments from more than 40 European countries.

LIFE enables **innovative responses to climate change at local and regional levels**

Recognising the urgent need to take action on climate change, many local and regional authorities (LRAs) have successfully used LIFE support to develop and test responses at local and regional level. The number of projects in this area has increased significantly since the launch of the LIFE+ programme (2007-2013), which now includes climate change as a priority objective.



LIFE funding was used to apply an energy efficiency technology to a multi-storey building, thus saving 275,000 kWh/yr compared to a conventional building

LIFE projects led by LRAs target both climate change mitigation and adaptation. These projects cover a range of issues, from highlighting the potential for action at local and regional levels, to addressing gaps in the availability of data, developing integrated climate change strategies, and testing and demonstrating the implementation of specific mitigation or adaptation measures.

TAKING RESPONSIBILITY

Awareness and recognition of the role or potential role of LRAs in addressing climate change is not universal, however. Some governments, and even some LRAs, are not yet convinced of the merits of action at sub-national level, or have not yet worked out what the role of LRAs should be.

The LAKs LIFE project (**LIFE07 ENV/IT/000451**) is attempting to address this issue by supporting four European cities to commit themselves, on a long-term basis, to reducing greenhouse gas (GHG) emissions. The project is working to enhance knowledge, skills and awareness at the political level of the potential for local action. A process of developing local responsibility is also being started

through the definition of targets and the implementation of a monitoring, reporting and evaluation system. The project is led by the commune of Reggio Emilia (Italy), with partners from Padova (Italy) Girona (Spain) and Bydgoszcz (Poland).

DEVELOPING EFFECTIVE STRATEGIES: UNDERSTANDING THE LOCAL CONTEXT

A number of LIFE projects have focused on developing climate change strategies at local and regional level. These strategies cover both mitigation and adaptation and generally seek to assess climate change issues in the locality or region concerned and to develop responses that are tailored to this situation.

Good quality data on GHG emissions at local or regional level are essential to developing a successful climate change mitigation strategy, as they allow for the establishment of a baseline and for the identification of the main sources of emissions.

Recognising that these types of data have not always been readily available, the LIFE MedClima project (**LIFE02 ENV/GR/000362**) successfully developed and tested an innovative rapid CO₂ emissions assessment method, which provides local authorities with a simple and easy-to-use tool for estimating CO₂ emissions.



Photo: LIFE03 ENV/UK/000611

The RESPONSE project developed innovative mapping techniques to assess current and future risks in coastal areas

Drawing on this and other related methods, the CLIM-LOCAL2020 LIFE project (**LIFE07 ENV/GR/000282**), led by the municipality of Volos (Greece), is putting the assessment of local GHG emissions at the centre of a systematic approach to strategic planning for climate change mitigation at local level. This project will undertake a comprehensive survey at municipal level to determine current and projected future GHG emissions. This will allow for the identification of the main sources of GHG emissions and the best emissions reduction options.

The FACTOR20 LIFE project (**LIFE08 ENV/IT/000430**), led by the Lombardy region, is testing a regional approach to data collection, by working to harmo-

nise regional databases on local energy systems. This will facilitate the monitoring of impacts of energy activity on GHG emissions and provide baseline data for regional information systems and policies. The data will be used to define regional sectoral targets on emissions reductions, with regional targets then forming a basis for local targets. The project is being implemented and demonstrated in six local authority areas across three regions.

Good quality information is also essential to developing effective climate change adaptation strategies. The UK's RESPONSE project (**LIFE03 ENV/UK/000611**), led by the Isle of Wight Council, successfully developed a highly innovative mapping technique to assess current and future risks in coastal areas. Going beyond previous macro-scale classifications of coasts, the project methodology allows for an assessment of local coastlines to provide detailed estimates of likely future changes. This enables engineers, planners and local decision-makers to anticipate impacts that could emerge over future decades and plan responses to minimise the risks or to mitigate possible consequences.

The increased incidence of flooding presents a major challenge for many LRAs. In the Latvian capital, Riga, for example, the frequency and severity of flash floods is a growing problem for the local city council. In 2008, the council launched a LIFE project (**LIFE08 ENV/**

Riga has taken steps to avoid flash flood damage by investigating hydrological processes intensified by climate change and incorporating them into its planning system



Photo: LIFE08 ENV/LV/000451



The Las Rozas project will test and evaluate approaches to tackle climate change, such as using green areas as carbon sinks

LV/000451) to carry out detailed studies of the hydrological processes affecting Riga and their current and potential impacts. The main objective of the project is to ensure that hydrological processes intensified by climate change phenomena are adequately investigated and incorporated into the city's planning system.

Similarly, in Helsinki, the "Julia 2003" LIFE project (**LIFE07 ENV/FIN/000145**) will develop scenarios for regional adaptations to climate change, providing information and predictions of the regional effects of climate change. The project results will feed into the development of a long-term regional strategy for adaptation to climate change in the Helsinki metropolitan area.

In Ancona (Italy) the local municipality (**LIFE08 ENV/IT/000436**) is drawing on the knowledge and expertise of local stakeholders to determine areas of vulnerability, as well as proportionate, appropriate and cost-effective measures to be included in its adaptation strategy. The ACT project will develop a methodological model that will be made available to other municipalities in Europe as a tool for developing local climate change adaptation strategies.

Climate change is of course a relatively new challenge for LRAs, many of whom are struggling to develop their knowledge of the issues and potential responses. Centralised support frameworks can greatly assist in this process. The Union of Baltic Cities (UBC) is currently implementing the CHAMP LIFE project (**LIFE07 ENV/FIN/000138**) that aims to develop and test such a framework.

The project focuses on developing competence in Integrated Management Systems (IMS) as a tool to enable LRAs to contribute to climate change commitments. It will create national IMS training hubs in four countries (Finland, Germany, Hungary, Italy) that will support local and sub-regional authorities in conducting baseline reviews, establishing strategic programmes and action plans, and organisational structures for climate change mitigation and adaptation. An EU-wide IMS competence network will also be established.

DEVELOPING THE RIGHT TOOLS AND STRUCTURES

Building capacity at local and regional levels, and developing appropriate tools and structures are essential to moving from strategy to action.

As part of the process of designing and implementing a provincial strategy on climate change (**LIFE08 ENV/E/000109**), the Province of Seville is establishing a climate change control centre, which will be responsible for capacity-building among relevant technicians and decision-makers. The centre will be supported by an advisory board, providing consultancy and assessment services throughout the ALICCIA project. Strategic approaches will be tested in four pilot municipalities, where a warning system will also be developed as a tool to control and manage the different variables that influence climate change locally.

Measuring the performance of different actions is critical to good decision-making in the implementation of local climate change strategies. A LIFE project (**LIFE08 ENV/E/000101**) being carried out by the municipality of Las Rozas (Spain) will establish a municipal 'technical commission on climate change' to monitor the implementation of its climate change strategy. This commission will evaluate the different approaches applied (e.g. green spaces as CO₂ sinks, reduced water consumption in parks, actions targeting the business sector) and assess their cost-effectiveness in meeting specific goals. The project also includes capacity building among 130 key municipal staff.

STRATEGY IMPLEMENTATION: MAKING A DIFFERENCE

Moving beyond the planning stage, some LIFE projects are already showing the way in terms of the implementation of key actions in areas where LRAs can really make a difference.

As a key intermediary between citizens and central government, LRAs have an important role to play in raising awareness about climate change within their

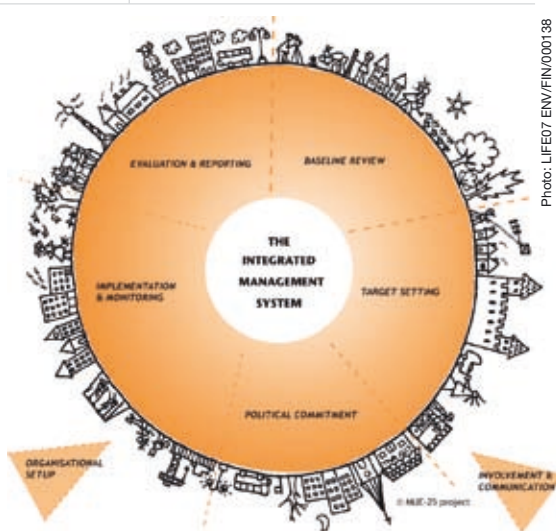




Photo: LIFE08 ENV/S/000269

As part of the OIL PRODIESEL project, used cooking oil was collected in these containers and converted into biodiesel

communities and in promoting and encouraging a transition to more sustainable patterns of behaviour. In Florence, the city authorities have launched the R.A.C.E.S. project (LIFE07 INF/IT/000487) aimed at raising awareness about climate change impacts and encouraging city residents to experiment with actions that will help to reduce GHG emissions. A local information and communication campaign will be supported by a family-tutoring scheme and a participation model, which allows the public to have a greater say in environmental decision-making processes.

In Stockholm, the city council's CLEANTRUCK project (LIFE08 ENV/S/000269) is focusing on one of the biggest sources of GHG emissions – road transport. GHG emissions from transport account for almost 20% of total emissions in the EU, with road transport responsible for about 93% of total transport emissions.

The CLEANTRUCK project is targeting goods distribution vehicles, which account for almost 50% of transport emissions in Stockholm, by demonstrating the commercial and technical viability of alternative fuels and new technologies. The project will construct filling pumps for alternative fuels; filling stations for CO₂ as a refrigerant (reducing the use of hydrofluorocarbons (HFCs) that are 1 300 times more potent as GHGs); and mobile stations for N₂ to inflate tyres.

The project will also facilitate the procurement of “green” vehicles by private distribution companies, offering a rebate of up to 50% for each vehicle purchased, as well as training around 100 drivers in “Heavy Eco-Driving”.

Road transport was also the target of the OIL PRODIESEL LIFE project (LIFE05 ENV/P/000369), which successfully developed an integrated and innovative waste management system for used cooking oil collected in Oeiras – a small town on the outskirts of

Lisbon. To implement the project, the beneficiary, the Portuguese environmental science NGO, ISQ institute, teamed up with the municipal council of Oeiras, a project partner. ISQ oversaw the development of a 1 000-litre biodiesel processor prototype and the construction and installation of 20 collection containers. The project tested the biodiesel produced in the Oeiras municipal transport fleet, which demonstrated both energy and cost savings. Eleven municipalities are already replicating the OILPRODIESEL collection system for used domestic cooking oil.

In the second application period of the Kyoto Protocol, starting from 2012, it will be possible to classify forests as “carbon sinks” and generate credits for meeting a country's carbon reduction targets.

Led by the Directorate for Forests and Mountain Economy in the Veneto Region (Italy), the LIFE CARBOMARK project (LIFE07 ENV/IT/000388) aims to develop a model for a local market for carbon credits generated through forestry, and test its efficiency by involving, on a voluntary basis, SMEs, forestry owners and organisations currently excluded from the ETS Directive. The project will help to establish the legislative and technical background necessary to support and improve the dissemination of regional carbon markets at national and European level.

LRAs are also active in testing measures to avert or reduce the impacts of climate change. In Malmö, for example, the city council is drawing on experiences from Canada and the UK to develop and test innovative flood management tools and approaches, such as open storm water systems, green facades and a new type of ‘green roof’. Within the framework of the city's GreenClimaAdapt LIFE project (LIFE07 ENV/S/000908), a 45 ha industrial area in south-east Malmö will serve as a “Green Climate Adaptation Area” in which these new tools will be tested. This area will include a storm water system that should retain up to 90% of rainfall over a 10-year period.



Photo: LIFE07 INF/IT/000487

The rise and fall: **Rome leads the way on carbon emissions**

In 2003, the municipality of Rome became one of the first in Europe to take concerted local action on climate change. With support from the LIFE programme, the city initiated an integrated planning process aimed at reducing greenhouse gas (GHG) emissions, setting an example for other municipalities across Europe.

The city of Rome has some experience when it comes to overcoming major challenges. In the course its 3 000-year history, the “eternal city” has demonstrated a remarkable capacity to survive and thrive in the face of countless different challenges and crises. It is no surprise therefore, that Rome should now be at the forefront of efforts to combat the threat of climate change.

In 2003, before the Kyoto Protocol came into force, Rome’s municipal authority was already considering its response to climate change. “At that time we didn’t know if the Kyoto Protocol would be ratified, but we were not content to wait and see,” explains Claudio Baffioni, the former LIFE project manager. “We wanted to better understand the role of local government. Everyone was aware of international or national initiatives, but it wasn’t clear how to build a bridge to the local level, and to citizens.”

In 2004, the city received support from the LIFE programme to draw up a local action plan to reduce GHG emissions by 6.5% by 2012 (compared to 1990), in line with the Kyoto target for Italy. The LIFE ROMAPERKYOTO project (**LIFE04 ENV/IT/000453**) also included a number of small pilot projects to test actions that might be included in the plan.

ESTABLISHING A BASELINE SCENARIO

The first step was to determine the existing emissions levels and the general trend. This involved compiling



The municipal authority of Rome used LIFE funding to draw up a local action plan to reduce GHG emissions by 6.5% by 2012

baseline data on GHG emissions for the period 1990 to 2002 and defining a reference (“business as usual”) scenario of emissions up to 2012.

“One of our project partners, ENEA (the Italian national agency for new technologies, energy and sustainable economic development) provided the necessary expertise for this work,” said Mr Baffioni. “The methodology applied used a combination of “top-down” and “bottom-up” approaches.”

These approaches drew on methodologies approved by the Intergovernmental Panel on Climate Change (IPCC), using

the results of the earlier ICLEI “Cities for Climate Protection” (CCP) Campaign, and involved the use of macro-energy data and local data on transport emissions. The main sectors considered were transport, residential, services, waste, industry, agriculture and energy transformation (refineries and power plants).

The most striking aspect of the baseline data was the sharp increase in emissions from the services sector (63%), reflecting the rapid expansion of this sector within the city economy. Emissions from transport had also increased significantly (17%), but had stabilised

since 2002. Similarly, emissions from the waste sector had stabilised since 2005, thanks to a shift from landfill.

The reference scenario, which was based on economic forecasts and the regulatory and urban planning context, showed that to meet the Kyoto target, a total emissions reduction of 1 020 kt of CO₂ equivalent below “the business as usual” scenario was required, with transport and services as the main target areas.

TESTING LOCAL APPROACHES

In order to test and demonstrate different approaches to reducing emissions, eight different pilot actions were implemented (see Table 1).

The afforestation action suffered problems with vandalism and damage from livestock, however, it has provided valuable information on the types and quantities of trees that should be planted for any subsequent emissions reduction efforts. All other pilot actions proved successful and subsequently served as models for demonstration and replication. The pilot on local traffic planning, for example, gave important inputs that have been adopted in the new Strategic Mobility Plan for Rome.



Photovoltaic shelters were installed to generate public lighting along a 300m cycle path

The public lighting project demonstrated the wider awareness raising benefit of the pilot actions. “This project was implemented in a poorer area of Rome and really helped to involve local people,” explains Riccardo Traversi, the Environment Councillor in the XV Municipality of Rome (the city is made up of 19 municipalities), which carried out this pilot action.

The same municipality also implemented the energy efficient schools project. “Initially we thought about concentrating all our efforts on one school, to create a model,” recalls Mr Traversi. “However, we realised that this might set the standard too high, so we decided instead to involve more schools in order to start a process that could continue after the project ended.”

Table 1 – Pilot actions carried out by the ROMAPERKYOTO project

Pilot action	Description	Results
Afforestation	Afforestation of 10 ha of abandoned urban wasteland	Preparation and plantation of an area of 12 ha
Green public procurement	Public procurement in the city administration	The establishment of criteria for green procurement and issuing of two city council resolutions
Environmental accounting	Environmental accounting for public interventions	A new tool for environmental accounting introduced in local authorities
Public lighting	LED public lighting and photovoltaic shelter on a 300m cycle path	A direct reduction in GHG emissions of 1 392 kg CO ₂ eqv/yr
Monitoring of photovoltaic plants	Monitoring the performance of photovoltaic projects installed in three schools	Evaluation of the energy produced in comparison with parameters declared by manufacturers
Energy efficiency of school buildings	Installation of a new heating system in a nursery school	Estimated reduction in GHG emissions of 2 090 kg CO ₂ eqv/yr
Analysis of the energy performance of buildings	Energy performance analysis of 37 schools	Achieved energy ratings and certification in 37 schools
Local traffic plan	Local traffic plan in one of the city's communes	Estimated reduction in GHG emissions of 1.0 ktonne CO ₂ eqv/yr

A CLIMATE CHANGE ACTION PLAN FOR ROME

Building on the results of the pilot projects, an Action Plan for the Reduction of GHGs in Rome was drawn up and approved by the municipal council on 18 March 2009. The plan contains policy recommendations and a range of actions to be carried out by the local municipal authority itself as well as by other local partners who have made commitments in the form of voluntary agreements. The action plan covers the period to 2012, after which Rome is set to implement a master plan to become the world's first "Post-Carbon Biosphere City".

A RECIPE FOR SUCCESS

Claudio Baffioni attributes the success of the LIFE project to the use of voluntary agreements to involve local partners. "The municipality had already successfully launched an Agenda 21 initiative, so it was decided to use the same approach. We posed the challenge: the city of Rome wants to reduce its emissions. Who wants to co-operate and be part of this effort?"

This was a risk, Mr Baffioni admits, but one that ultimately paid off. From the 38 organisations that were initially invited to participate, 30 signed up immediately, and the other eight soon followed. These organisations nominated representatives to an



CITIZEN POWER

"Palocco per Kyoto", a local community-based climate initiative, was the brainchild of Denise Lancia, now the association's president. "It started with a meeting in the local hall," she recalls. "We expected about 60 people, but over 500 turned up." Palocco per Kyoto joined the Roma per Kyoto project in order to inspire people living in other parts of the city to take action. "This is a battle that cannot be won unless we all ask ourselves how can we reduce by 20-20-20¹ my lifestyle?" insists Ms. Lancia. The organisation's involvement in the project has also helped to make citizens feel closer to the local administration, and to big industry. "One thing that I have discovered is that citizens are there and available. They want to be involved in these actions."

¹ This refers to the climate and energy targets set by the EU heads of state and government to be met by 2020. These "20-20-20" targets are:

- A reduction in EU greenhouse gas emissions of at least 20% below 1990 levels;
- 20% of EU energy consumption to come from renewable resources; and
- A 20% reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency.

advisory group, which included some big names (ENEA, IKEA, etc.), alongside small local associations, such as Palocco per Kyoto (see box "Citizen power").

"The process worked very well. Many of the partners committed themselves to implementing pilot actions and other initiatives. But even more important was the fact that we now had people like Denise Lancia, president of a residents association, working alongside a person from the petroleum industry. Previously, I just wouldn't have thought this was possible," acknowledges Mr Baffioni.

SUSTAINING THE MOMENTUM

To support the continuation of the project's activities, the municipal council has established a permanent climate change Observatory, which houses a conservatory with indigenous plants, an educational area for children, a citizen's information office, and an area for expositions/conferences on climate change issues.

"When the project is running, it creates a lot of enthusiasm," says Claudio Baffioni. "However, once it ends it is difficult to keep everyone's interest and attention. This is why the Observatory is so important."



ITALY

Project number: LIFE04 ENV/IT/000453

Title: ROMAPERKYOTO - Realization of Rome's Action Plan to achieve the Kyoto's Protocol objective of Green House Gas Reduction

Beneficiary: City of Rome

Contact: Claudio BAFFIONI - Project Manager

Email: claudio.baffioni@comune.roma.it

Website: www.comune.roma.it

Period: Oct-2004 to Sept-2008

Total budget: €2 285 000

LIFE contribution: €1 085 000





→ *Water management & local/regional authorities*



Policy challenges in water management

Some two out of three Europeans are worried about water quality and availability in their country. Because water issues transcend national boundaries, the European Commission has issued a number of directives that aim to integrate management of this precious resource and ensure its effective protection (see box). Local and regional authorities, through an effective transfer of competencies and means, have the legal authority, financial resources, institutional capacity and adequate human and technical skills to manage water supply and sanitation locally and regionally. However, many challenges lie ahead on the road to achieving this goal.

As acknowledged by the 5th World Water Forum's Istanbul Water Consensus for Local and Regional Authorities of March 2009¹, "The local level plays an increasingly important role in the provision of water and sanitation services."

Consequently, one of the demands of the signatories to the Istanbul Water Consensus is for national governments and international institutions to "Involve local

and regional authorities in the definition and implementation of political strategies taken at the national and supranational level for sustainable water management."

At EU level, the most important "political strategy" with regard to water management is the **Water Framework Directive (WFD)**, alongside the floods, drinking water and urban wastewater directives (see box).

Integrated river basin management is the framework within which measures

for achieving 'good status' are to be implemented. The idea is that management by the river basin – the natural geographical and hydrological unit – is the most efficient model for water management, as opposed to administrative or political boundaries. Consequently, according to the WFD, **River Basin Management Plans (RBMPs)** must be developed for transboundary basins requiring joint management between two or more Member States. The management plans should provide a clear indication of the way the objectives set for the river basin are to be reached within

¹ worldwaterforum.org/.../Istanbul_Water_Consensus_Eng_Final.pdf

Integrated river basin management is crucial to achieving good ecological status for Europe's fresh water bodies by 2015



Photo: LIFE05 ENV/DK/000145 and Jan Korod Wnther



THE WATER FRAMEWORK DIRECTIVE (WFD)

The EU Water Framework Directive (2000/60/EC) aims for 'good status' for all ground and surface waters in the EU and provides a framework for the co-ordinated implementation of all other water legislation. It maintains existing commitments of Member States under the Nitrates Directive (91/676/EEC) and Urban Waste Water Treatment Directive (91/271/EEC). Under the timetable for implementation of the WFD, programmes of measures will be operational by the end of 2012, and the 'good status' of waters is to be achieved by the end of 2015.

The EU's integrated approach to water policy encompasses a number of other directives that support and complement the aims of the WFD. These include, among others, the Groundwater Directive (2006/118/EC), the Drinking Water Directive (80/778/EEC, revised as 98/83/EC), the Urban Waste Water Treatment Directive (91/271/EEC), the Nitrates Directive (91/676/EEC), the Bathing Water Quality Directive (2006/7/EC) and the Marine Strategy Framework Directive (2008/56/EC).

the required timescale. The river basin approach to water management should also allow a flexible response to **climate change** impacts, which are likely to be different in northern and southern Europe. The WFD establishes a mechanism that should allow for adaptation and mitigation measures in response to challenges such as **water scarcity**. Planning the necessary measures for addressing droughts and floods risk will also be an integral part of this system.

The term '**hydromorphological alterations**' summarises changes in the quantity and dynamics of water and changes to the shape of the surface water. Hydromorphological pressures and impacts present a significant threat to the achievement of the WFD's objectives. At policy development level, one way to ensure a better integration between different policies, such as hydropower and navigation development, is an increase in the transparency of decision-making.

INVOLVING MUNICIPALITIES AND REGIONS

With integrated river basin management crucial to achieving good ecological status for Europe's fresh water bodies by 2015, it is therefore essential to establish effective mechanisms to involve local and regional authorities in the process. Such mechanisms could include river

basin associations or councils, which co-ordinate national, regional and local authorities and co-operate with different user groups. In compliance with the principle of subsidiarity, local authorities, in consultation with all stakeholders, should have the option to choose between various management models.

Climate change is a global phenomenon but consequences differ from region to region: solutions therefore need to be developed and implemented regionally and locally, particularly in insular and coastal countries. Challenges facing local and regional authorities include being able to adapt local water management and water and sanitation infrastructure to meet the challenges posed by climate change, such as water scarcity, flooding/storm water, changing rainfall patterns, rising sea levels, and other impacts on water resources.

One of the key challenges in water management is to make local and regional planning and design more water sensitive, linking sanitation, drainage, the drinking water supply, wastewater and solid waste management in a co-ordinated approach. Investment in infrastructure can reduce the amount of water lost through leaks. However, such investments must be made so as to deliver high quality water management to all citizens at an affordable price.

The Istanbul Water Consensus points to the need to "Develop innovative financing mechanisms and regulatory frameworks to facilitate access for local and regional governments to direct financing and increase financing for local water and sanitation infrastructure."

Local and regional authorities can also play an important role in reducing water loss by raising public awareness of the need to save water. Working with the LIFE programme could be one way of achieving this. A requirement of all LIFE projects is the dissemination of project results to relevant specialists, other stakeholders and the general public. The LIFE programme also now includes LIFE+ Information & Communication, a dedicated component that co-finances projects relating to communication and awareness raising campaigns on environmental, nature protection or biodiversity conservation issues.

Many LIFE projects have been particularly influential in developing analyses of pressures, impacts and best practice in river basin planning—promoting the key activities of the strategy, namely: the sharing of information; management of information and data; development of guidance on technical issues; and the application, testing and validation of guidance. The following pages include a selection of these projects.

LRA's face planning challenges in developing a co-ordinated approach linking sanitation, drainage, the drinking water supply, wastewater and solid waste management



Photo: LIFE06 ENV/DK/000229

Working with LIFE to face water management challenges



Photo: LIFE06 ENV/DK/00029

Local and regional authorities (LRAs) face many challenges in delivering effective water management strategies. The LIFE programme, in particular LIFE environment, has been a source of both funding and inspiration in this struggle. Local and regional bodies across Europe have worked with LIFE either as project beneficiaries or as project partners to promote best practice and innovative approaches in delivering key policy goals around the management of that most precious resource: water.

More than 130 LIFE Environment projects dealing with water-related issues have involved local and regional authorities. These projects have addressed a wide range of topics, including the effects of climate change, run-off from farmers' fields, reducing water loss, restoring hydromorphological features, wastewater treatment in urban areas and flood prevention.

CLIMATE CHANGE, WATER AND LIFE

An ongoing LIFE+ project in Italy, TRUST (Tool for regional - scale assessment of groundwater storage improvement in adaptation to climate change – **LIFE07 ENV/IT/000475**) is demonstrating innovative actions aimed at halting and reversing the progressive decline of

the water table in the Veneto and Friuli Plain, including the lowering of the water table in the upper plain and the dessication of wetlands and depressurisation of aquifers in the medium plain. Key to the success of the project will be the incorporation of climate change predictions into river basin management and the identification of adaptation measures to mitigate the impacts

Several LIFE Environment projects have shown how LRAs have played a fundamental role in improving the hydromorphology of rivers and other water bodies



Photo: LIFE07 ENV/IS/000038

of drought and water scarcity. One such measure will be artificial aquifer recharge using excess surface waters, for example from floods. Of interest to other LRAs, the project has already used remote sensing and GIS for mapping of land-use and the irrigation water deficit caused by climate change and developed a range of climate change scenarios. By its completion in 2011, TRUST also intends to calculate the impact of climate change on future demand and aquifer recharge, develop a tool for large-scale groundwater balance and evaluate objectives and measures for artificial aquifer recharge, including a cost-benefit analysis.

REDUCING THE IMPACT OF RUN-OFF

Another current LIFE+ project, this time in Spain, AQUAVAL (**LIFE08 ENV/E/000099**) is in the process of introducing sustainable urban drainage systems (SUDS) to the municipalities of Xativa and Benaguasil in Valencia. Given the need to prevent environmental damage from pollutants in storm water, as well as the importance of investment in water management infrastructure to LRAs, this LIFE project potentially has a significant demonstration value, as well as its impact on the municipalities concerned. It is hoped that the SUDS will improve the water quality of receiving water courses, prevent flooding, reduce energy consumption and allow rainwater to be used in irrigation and street cleaning.

In Denmark, the TREASURE project (**LIFE06 ENV/DK/000229**) successfully demonstrated technologies for efficiently reducing urban pollutant loads into receiving waters by up to 80-90%. Three 'pilot' detention ponds were constructed in the cities of Odense, Silkeborg and Aarhus. Equipped for on-line performance monitoring of the treatment, these ponds were designed not only to remove small particles and colloidal and soluble bound pollutants from the surface waters collected from the catchment area, but, importantly, also to be attractive showpieces as part of the local urban landscape. Outlet concentrations of all measured



Photo: LIFE06 ENV/DK/000229

This detention pond in Odense was designed to monitor the efficiency of the technologies used to reduce urban pollutant loads in receiving waters

pollutants were consistently below the relevant water quality criteria. Copper was reduced from an average of 310 µg/L down to 4 µg/L, corresponding to an overall removal rate of 99%. Phosphorous was reduced from 0.27 to 0.025 mg/L, corresponding to an overall removal rate of 91%.

Application of the technology is not restricted to any particular urban context and could also be expanded to purposes such as treating contaminated drinking water or phosphorous-polluted surface waters. The success of TREASURE was recognised with a LIFE Environment Best Project award in 2010.

REDUCING WATER LOSS AND WASTAGE

Excessive consumption and leaking pipes are major challenges to any LRA's ability to effectively manage its water resources. Two LIFE projects that demonstrate different approaches to addressing these issues are DROPAWATER in Spain (**LIFE02 ENV/E/000183**) and RAKWANET in Estonia (**LIFE00 ENV/EE/000922**). The former installed water meters in 3 800 houses in the exclave of Cueta so that, using specialised software, householders were able to access data about their water consumption and thus reduce use where possible. Those using the meters actually reduced consumption of drinking

water by 10% (the forecast was 8%). The project also used advanced technology to check pipes for leaks and, where repairs were needed, carry them out with minimal noise and traffic disruption by using a "compact pipe/roll down" system.

The Estonian project showed how LIFE has helped a municipality (Rakvere) in what was then an accession state significantly improve drinking water and groundwater quality, bringing both into line with EU and national legislation. The closure of old wells helped reduce the leaking of pollutants into groundwater,

The TREASURE technology can also be used for treating contaminated drinking water

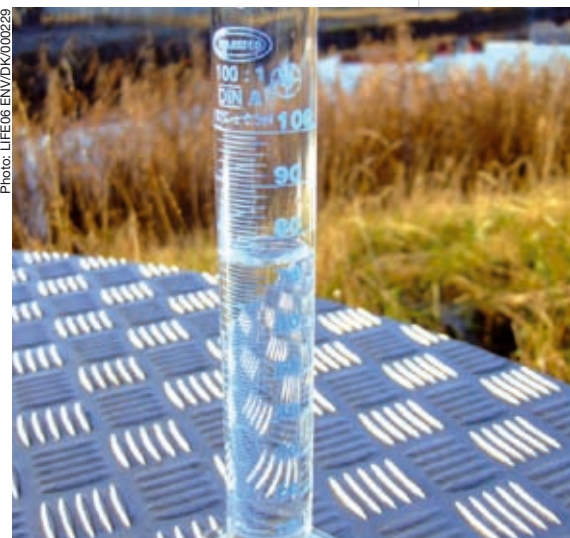


Photo: LIFE06 ENV/DK/000229



Photo: LIFE07 ENV/B/000038

The WALPHY project has carried out hydromorphological restoration activities such as re-meandering of a stretch of the the River Meuse

while the introduction of a comprehensive leak monitoring system and computerised hydraulic model of the water network reduced the time taken to detect leaks from 5-6 to 2-3 days and cut water losses from 37% to 21% of total extraction.

RESTORING HYDROMORPHOLOGICAL FEATURES

Improving the hydromorphology of rivers and other water bodies is a complex task. Several LIFE Environment projects show how LRAs may take steps to this end. Two projects in Hungary (**LIFE03 ENV/H/000280** and **LIFE04 ENV/HU/000382**) have respectively restored the floodplain of the middle Tisza and implemented a new flow-supplementation system on a heavily modified waterbody (HMW) in the lower Szigetköz, the transboundary Danube wetland area.

The former project carried out actions to restore native habitats, including the removal of alien species. Grazing was then reintroduced in the pilot area to ensure the long-term success of the restoration activities. The latter project's actions included reconstructing an important sluice gate and building a 3 865 m-long channel bed, transporting 1.5-2.3 m³/s water.

The implementation of the flow-supplementation system allowed the development and testing of a GIS-based decision support tool (DST) to help decision-makers model and evaluate strategic planning choices at the local level.

Aiding decision-makers in selecting the right methods is also the main aim of the Belgian WALPHY project (**LIFE07 ENV/B/000038**). The goal of this current LIFE Environment project is to design a DST for the hydromorphological restoration of water bodies in Wallonia. Restoration activities will be carried out on a stretch of the River Meuse basin upstream of Andenne, near Namur, with the aim of achieving "good ecological status", as required by the Water Framework Directive. Monitoring and assessment of the pilot area will enable the WALPHY team to develop a transferable methodology for assessing the hydromorphological quality of river restoration projects.

IMPROVING WASTEWATER TREATMENT IN CITIES

A number of LIFE projects have developed and tested setting up focus



Photo: LIFE04 ENV/HU/000382



SMURF BRINGS LIFE TO A COMMUNITY

LRAs have been involved in LIFE projects not only as beneficiaries, but also as project partners. One highly successful example of this comes from the UK, where the SMURF - Sustainable Management of Urban Rivers & Foodplains – project (**LIFE02 ENV/UK/000144**) renovated a stretch of the River Tame in Perry Hall Park, Birmingham. The social impact of the project was at the forefront of planning decisions, and focus groups were set up to involve the local community in defining project targets. This led to actions to make the river more accessible, such as the clearing away of undergrowth and the creation of a riverside path with benches and rubbish bins. Parts of the river were also reconstructed to allow it to pursue a more natural course. Community volunteers helped with the restoration activities, which have been well-received. The heightened awareness generated by the project prompted the local council to appoint a park ranger after-LIFE. The SMURF project is a good example of how public participation can be used to implement the WFD. It was awarded “Best” Project status for 2006-2007 by DG Environment.

groups, innovations in wastewater treatment processes that could, if applied widely, have great benefits in terms of cost-effective water management.

The Spanish ACUÍFERO TORDERA project (**LIFE00 ENV/E/000539**) promoted the reuse of wastewater to enable the sustainable management at local level of the alluvial aquifer of the River Tordera in Catalonia. Recycled treated water was used both to recharge the aquifer and establish wetlands in the river basin, serving as a model for other communities in the area.

The solar powered system transported treated water upstream to a point where extraction wells for water consumption are located, allowing reuse of the water in a closed loop.

Pioneering new sewage treatment processes were the outcome of both the RECYCLAQUA project in France (**LIFE03 ENV/F/000257**) and the WET project in the Netherlands (**LIFE06 ENV/NL/000167**). The former demonstrated lumbri-filtration, the use of earthworms to treat organically polluted water. A fully-functioning treatment plant was



Photo: LIFE07 ENV/IT/000475

Measuring the flow of the river using an Acoustic Doppler Current Profiler (ADCP)

constructed for the town of Combailaux in Languedoc-Rousillon, which was able to reach French legal requirements for water purity, as well as producing minimal amounts of sludge. Other benefits of the technology demonstrated by this “Best” LIFE Environment project 2006-2007 were a small footprint for the treatment plant and low energy use.

LIFE WET built a pilot plant to test different methods of removing nitrogen (N), phosphorous (P), as well as heavy metals, pesticides, herbicides, medicine residues and endocrine disruptors from the water supply in Leiden, South Holland. Various sand filtration, carbon filtration and oxidation techniques were tested. The aim was to develop a low cost technology that could be added to existing treatment plants. A cost-benefit analysis for each method was drawn up and results showed the most cost effective solution for N and P removal to be a single-filter continuous sand filtration system. As a result of the successful LIFE trials, a full-scale version of this system was installed at the Leiden-Noord sewage plant, helping keep N and P levels in surface water below the limits set by the WFD. The WET project was one of the “Best of the Best” LIFE Environment projects for 2009.

The full-scale sand filtration system installed by the WET project in Leiden-Noord sewage plant will keep nitrogen and phosphorous loads within limits set by the Water Framework Directive



Photo: Justin Toland

FLOODSCAN pinpoints flood risks in Bavaria

Flood events pose a growing threat to the environment, people and property. As a result, the 2007 EU Floods Directive places the emphasis on flood risk management rather than flood security. The LIFE FLOODSCAN project in southern Germany shows how more cost effective technologies can be implemented to develop flood hazard maps that will increase information and reduce flood risks for the general public, businesses and local and regional authorities.



Project manager Dr. Dieter Rieger (nearest camera) and colleague Fabian Unger pore over one of the updated maps produced by the FLOODSCAN project

The frequency and intensity of flood events in Europe is set to rise as a result of climate change, creating significant challenges for local and regional authorities (LRAs). Germany has experienced a number of extreme floods in recent years, including on the Rhine (1993 and 1995), Danube and Elbe (2002 and 2010) and in Southern Bavaria (1999 and 2005). The EU Floods Directive (2007/60/EC) recognises precaution as the most effective protection against flood damage. Both this directive and the 2005 German Water Law

(WHG) enshrine a flood risk management approach in legislation, demanding far-reaching flood risk communication with the general public.

“Since we knew this Floods Directive was coming, we knew we would have to update our flood hazard maps, and knew we would need more effective technology to do this,” says project manager, Dr. Dieter Rieger, explaining the background to FLOODSCAN. The project, which was led by the Bavarian Environment Agency (LfU), in part-

nership with the Bavarian Agency for Surveying and Geographic Information (LVG) and the Chair of Forest Policy at Munich Technical University (TUM), set out to improve awareness about flood risks through the application of the hydraulic 2-D modelling of flood hazard areas. A newly developed technology uses laser scanning and other remote sensing data for the creation of hydraulic 2D models. “Laser scanning technology was becoming more mature, so it was becoming feasible to use it for this purpose,” notes Dr. Rieger.

→ THE TWO TYPES OF FLOOD

River floods are mainly caused by intense and continuous rain. When soils become water-saturated, surface run-off is undiminished and accumulates in rivers, causing inundations. Such floods can occur when soils are already saturated by previous precipitation; in winter they can occur when the ground is frozen or covered in snow.

Flash floods are the result of heavy rainfalls and thunderstorms, especially in mountainous regions. Such heavy precipitation can turn small water bodies into fast-flowing rivers and inundate drainage systems, with potentially disastrous consequences.

One of the more interesting challenges the project faced was over the co-ordination of the laser scanning flights, which could only be done in early spring, before the leaves come out. "We divided the state of Bavaria into lots, more than 50 in total. Contractors could to some extent decide when they would fly over certain lots," Dr. Rieger explains.

COST-EFFECTIVE MAPPING FOR ALL

While it is difficult to accurately compare, the data-gathering methodology demonstrated by FLOODSCAN is estimated to be more cost effective than the traditional approach, with an overall saving of around one-third. Figures given by the project suggest that FLOODSCAN costs €750/river km, compared with €1 200/river km for the previous approach. "What's more, the bigger the waterbody, the bigger the saving," notes Dr. Rieger.

Consultations with the general public and specialist users helped inform the development of new flood hazard maps and improvements to the exist-

ing web-based flood mapping service (www.iug.bayern.de). The updated service went online in September 2010. Users can now see maps for different flood event frequencies (high "10-year"; medium "100-year", and low probability "extreme" floods), which are highlighted in shades of blue, for ease of understanding. The maps also show the water depth of different flood events and areas in flood plains where building is prohibited.

Dr Rieger is very proud of the web mapping service, which increases both the amount of information available and the level of detail. "It creates more transparency because homeowners, local and regional planning authorities as well as insurance companies have access to the same level of information." Whilst maps of designated flood areas were previously available in Bavaria, these did not include the different flood scenarios (10-year, etc) and water depth information.

In line with the INSPIRE Directive for harmonising the sharing of geo-data by mapping agencies (2007/2/EC), the information used to generate the maps is also available in real-time to insurance companies, which are then able to generate their own "front-end" maps.

BENEFITS FOR LRAS

The new mapping service is also good news for local and regional authorities. In Germany, county administrations lead the legal planning process for the declaration of a flood area, whilst municipalities are responsible for zoning regula-

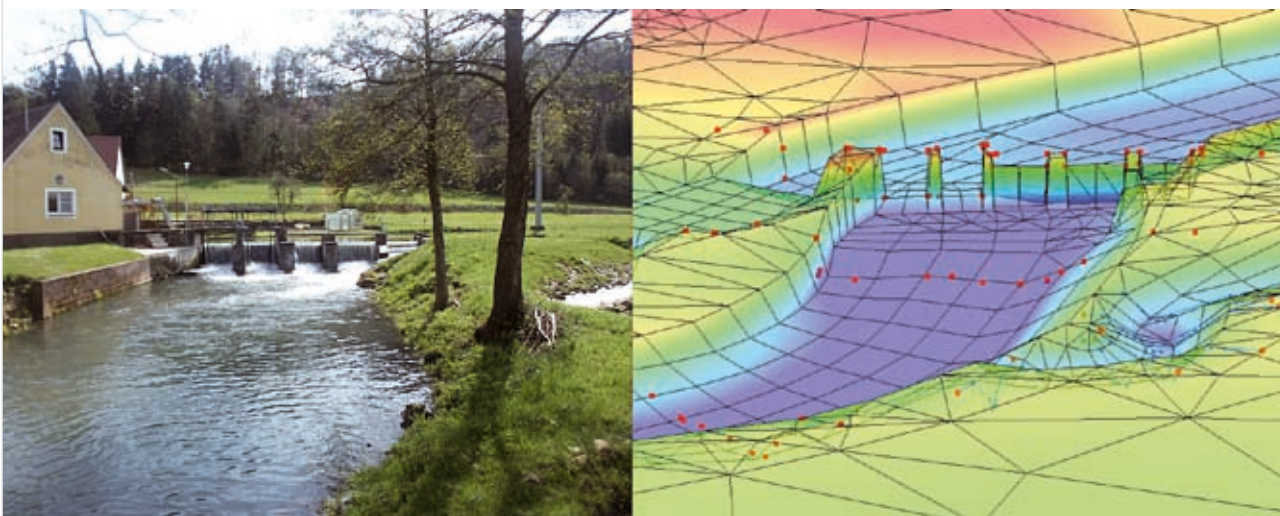
tions. "This increased information base enables better zoning," believes Dr. Rieger. "Municipalities now have access to the online service and flood hazard maps and can take more effective planning decisions."

The more detailed information made available by the FLOODSCAN technology has already led to the banning of building in certain areas. The greater level of information available to the public also enables "increased understanding" of such measures, says Dr. Rieger. A second benefit is that, "Because this technology is much cheaper and can map in more detail, it can be much more extensive: it can include small water bodies, which can also cause flooding, but which were not previously mapped."

The "Flood Phone Booth" was an innovative and popular dissemination technique

The improved flood hazard mapping service is detailed and easy-to-understand





Laser scanning and other remote sensing data enabled the project to create accurate models of Bavaria's water bodies

LfU is targeting publicity at local level decision-makers to make them aware of the new flood mapping service. Dissemination activities include flyers and information stands. Three workshops held during the LIFE project attracted much interest from competent authorities elsewhere in the EU. Dr. Rieger points out that the Polish water authorities are now working with a German engineering firm to implement the same mapping methodology.

NEW WAYS OF IMPROVING FLOOD RISK AWARENESS

The LIFE FLOODSCAN project developed a number of innovative ways of getting its message across to the general public. One of these was a "flood phone booth", a decom-

missioned phone box that plays audio messages aimed at different age groups and explaining different aspects of floods, as well as displaying flood hazard maps and pictures of inundation heights. The booth has travelled through various towns and districts and continues to tour: "It can be booked and is being booked more and more often as it gets better known among the regional water management authorities," notes Dr. Rieger. A survey conducted by project partner TUM in the town of Amberg found that two-thirds of visitors to the booth believe it can contribute to a heightening of risk awareness of floods, whilst 93% of users thought it was a good idea to use a modified phone booth to provide information about flooding. The flood hazard maps themselves were given a positive appraisal by 89% of visitors.

FLOODSCAN also evaluated the effectiveness of existing flood information panels and designed a new one that was found to better communicate information about water levels to the general public. Another innovative dissemination approach was the creation of a land art park "Fluss-Werke" in the Isar river floodplains in Moosburg. The park's artworks are designed to make people think about the possibilities of floods occurring, as well as having an aesthetic value - in certain weather conditions passers by can see the sculptures flooded or destroyed.

"Flooding is not a sexy subject – these approaches were very good at getting attention for something which people are not necessarily going to ask about but which is important to them," says Dr. Rieger. "The FLOODSCAN project is very much in the spirit of flood risk management – of enabling people to take precautions because they have the information."



GERMANY

Project number: LIFE06 ENV/D/000461

Title: Large scale adjustment of new technology for fast, precise and cost-efficient hydraulic 2d-modelling of flood (hazard) areas by combining laser scanning with remote sensing data

Beneficiary:
LfU (Bavarian Environment Agency)

Contact: Dr Dieter Rieger

Email: dieter.rieger@lfu.bayern.de

Website:
<http://www.wzw.tum.de/floodscan/>

Period: Jul-2006 to Dec-2009

Total budget: €2 748 000

LIFE contribution: €1 303 000

Land art was used to make people think about the possibility of floods occurring





→ *Spatial planning & local/regional authorities*



Spatial planning challenges for local and regional authorities

Europe's local and regional authorities are responsible for the successful implementation at a local level of European Union policies influencing spatial planning (see box). Integrated management solutions, supported by LIFE and other initiatives, are being successfully tested and implemented to address some of these issues at local and regional levels of land-use planning – including in its environmental dimension. However, many challenges remain.

A recent report by the European Environment Agency on the quality of life in Europe's cities and towns¹ highlights many of the pressing concerns for Europe's local and regional authorities (LRAs), especially those dealing directly with urban issues. Problems noted include how individuals, in searching to improve their quality of life, are driving urban migrations and urban sprawl, with all the “unintended negative consequences” (urban dwellers represent nearly 75% of the European population, according to the EEA, probably rising to 80% by 2020). Growing consumption is also putting our environment under increasing pressure. The continu-

ing growth in mobility generates more noise and air pollution and increasing land consumption has negative impacts on biodiversity and ecosystems. The report warns that the current patterns of urbanisation and forms of most new urban development are unsustainable and becoming increasingly so, putting at risk the quality of life of inhabitants.

The report analyses the connections between the different dimensions of quality of life. These range from clear linkages, such as the health benefits of green open spaces for urban populations, to less evident relationships such as the way that individual housing choices impact on the environment and thus affect quality of life. The report concludes that partnership between

the local, regional, national and European levels of government is needed to ensure that we can cope better with common global challenges.

SUSTAINABLE DEVELOPMENT

Several priority areas are also highlighted at EU-level², as key to achieving a balanced and sustainable spatial development policy in Europe.

These include:

- Promotion of the networking of urban regions;

² ESDP “European Spatial Development Perspective”: Towards Balanced and Sustainable Development of the Territory of the European Union (European Commission, May 1999)

¹ Ensuring quality of life in Europe's cities and towns EEA Report No 5/2009

LRAs are faced with the challenge of making current patterns of urbanisation sustainable



Photo: Erwyn van der Meer

- Improving links between regions, notably in peripheral regions and densely populated areas with high traffic volumes;
- Development of 'Euro corridors';
- Conservation and development of biodiversity; and
- The need for Integrated Coastal Zone Management (ICZM).

According to the EU, "successful spatial development policy ...depends far more on co-operation with the local and regional levels (authorities) than in other policy areas."

INTEGRATED APPROACH

The Council of European Municipalities and Regions (CEMR) agrees, stating that: "Spatial planning should be dealt with in an integrated way, looking

at transport, housing, energy utilities, broadband infrastructure etc." In particular, it says, it is crucial to address issues such as how to integrate traffic and spatial planning, and how to tackle urban sprawl.

CEMR also emphasises that spatial planning is not just about urban issues, and should link policies such as transport, infrastructure, economic development and the environment, both horizontally and vertically. Europe's cities and towns in once peripheral regions are becoming more accessible. Therefore choices of location, including for new urban investments, are becoming more interchangeable. And as a result, the scale and scope of action required is increasingly dispersed, and is no longer the responsibility of any one sector or level of government.



SPATIAL PLANNING AND THE EU

The EU has no formal competence for spatial planning; however numerous EU policies and directives concerning, for example, ambient air quality, noise, transport and energy, address directly or indirectly the local dimension of spatial planning. Other EU policies provide guidance for LRA town and city planners.

In 1999, EU Member States adopted the *European Spatial Development Perspective (ESDP)*¹. This influential (non-binding) document promotes the development of a "polycentric and balanced urban system", the strengthening of the partnerships between urban and rural areas, and the wise management of natural areas and the cultural heritage.

The debate this generated culminated in the adoption of the *Territorial Agenda* by Member States in May 2007. This is a common policy paper aimed at mobilising the potential of European regions and cities and at using the EU's territorial diversity for sustainable economic growth and jobs through integrated spatial development.

Also in May 2007, Member States agreed on the *Leipzig Charter on sustainable European cities*², which emphasises the importance of cities in the formulation of future EU policies. This calls for a greater use of integrated urban development policy by cities.

The construction of a *European reference framework for sustainable cities* started in November 2008. This operational tool for the implementation of the Leipzig Charter principles by local authorities is intended to address concrete needs and to provide a solution usable by all cities to go further in sustainable urban policies³.

1 http://ec.europa.eu/regional_policy/sources/docoffic/official/reports/pdf/sum_en.pdf

2 http://www.eu2007.de/en/News/download_docs/Mai/0524-AN/075DokumentLeipzigCharta.pdf

3 <http://www.rfsustainablecities.eu/>

CONFLICTS

Another important challenge for Europe's land-use planners is how to manage the complex relationship between man-made and natural systems/networks – to find the right balance between development needs and the need to conserve biodiversity. For example, the relationship between the elements of the Natura 2000 network of conservation sites – such as wetlands, national parks, islands and coastal regions – and certain rural areas needs to be identified and co-ordinated at European level. But the network cannot function successfully without the active participation and support of LRAs.

Another potential source of conflict concerns the development of 'Euro corridors' – whereby future urban/peri-urban development must take into account the need for areas where economic activities can be clustered alongside the need for areas to be protected as green space.

CONCLUSION

Finally, local and regional authorities already co-operate extensively to overcome these and other spatial planning conflicts in areas of Europe. (See the following section for successful nature and environment case studies supported by the LIFE programme.) These integrated management efforts however, need to be stepped up. Adequate co-ordination of policy initiatives at EU level with policy implementation at local and regional levels is also essential.

Spatial planning should be dealt with in an integrated way, linking policies that do not only concern urban issues

Photo: LIFE02 ENV/E/000176



LIFE support for **spatial planning by LRAs**

LIFE has been, and continues to be, at the forefront of supporting efforts by municipalities and regions to demonstrate successful techniques and methods for the sustainable development of spatial planning in Europe.

LIFE projects can help local and regional authorities (LRAs) – especially those concerned with Europe's increasingly urbanised population – develop their land-use planning strategies in a more sustainable way. They can assist LRAs in the development of user-friendly tools for the sharing of environmental spatial information – improving planning decisions and promoting sustainable development strategies. Projects can also provide best practice

guidelines and opportunities for co-operation among other EU cities or regions. Importantly, projects can help municipalities to look ahead and consider the wider impacts of their local urban planning strategies and to take advantage of the co-operation and integration measures that are available.

Finally, LIFE projects have an important role to play in helping to raise awareness and understanding of spatial planning

issues among key groups such as local officials, planners, teachers, schoolchildren and health professionals.

SPATIAL PLANNING TOOLS

Many poor environmental management decisions are made in Europe, often due to insufficient information. For example, a lack of knowledge of pollution sources can cause poor recreational planning and a lack of

LIFE funding has been successfully used by local and regional authorities to develop spatial planning strategies in a more sustainable way

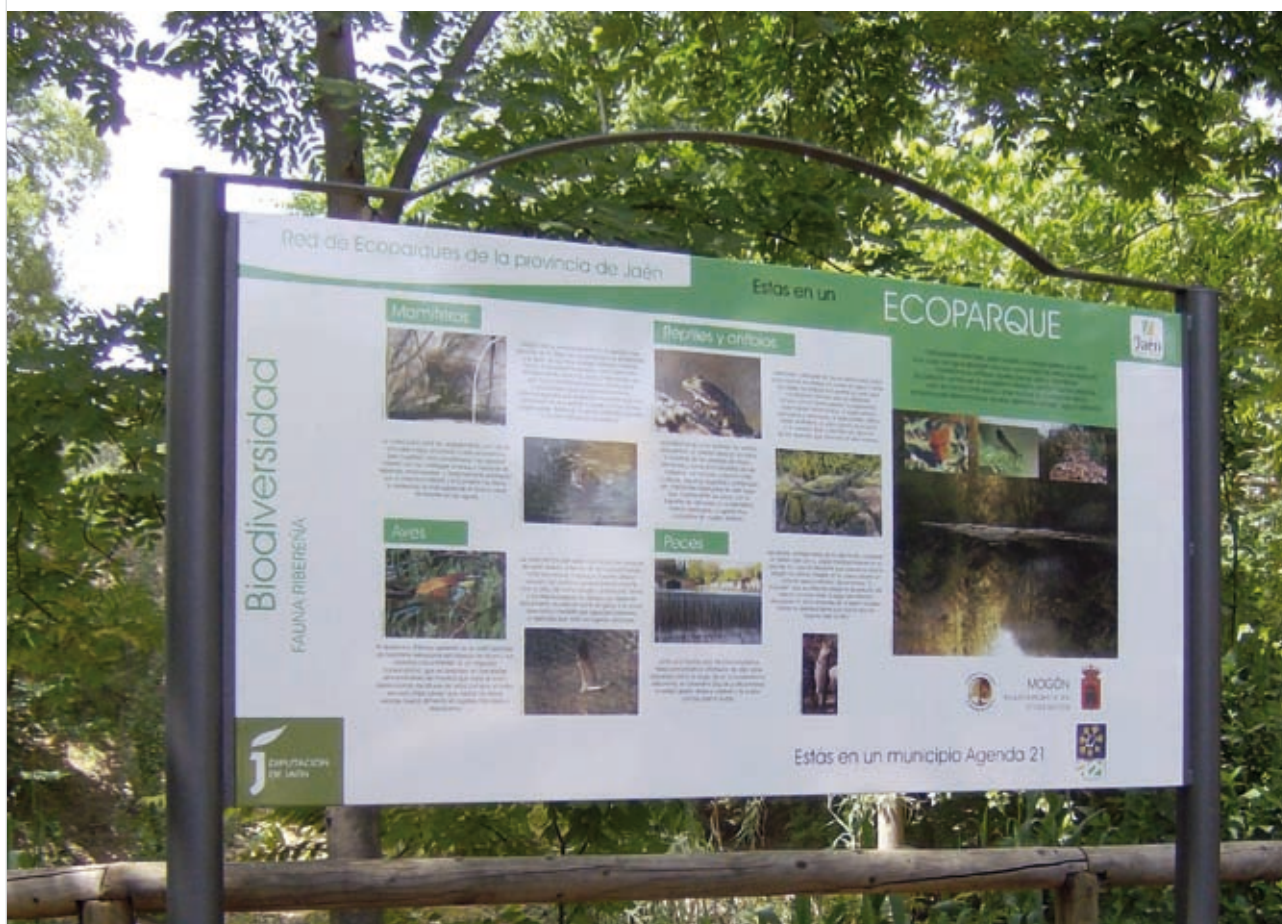


Photo: LIFE02 ENV/E/000176

understanding about species can lead to inadequate habitat protection. Spatial planning information is therefore essential for good decision-making and avoidance of conflicts.

There are many different producers of spatial planning tools, but data are often restricted by reasons of cost or accessibility. A successful Finnish project (**LIFE04 ENV/FI/000304**) addressed this problem – developing accessible, technologically sustainable and user-friendly mapping tools for sharing environmental spatial information. The ENVIFACILITATE project (a ‘Best of the Best’ LIFE Environment project winner 2007-08) was developed in partnership with the Regional Council of Southwest Finland. Its spatial planning tools provide users with access to the most recent data over the Internet. They allow maps and databases to be overlaid to give a clear representation of the spatial data with dozens of alternative data layers available. The project has contributed to the development of several national and international environmental information systems. It also supported the networking of spatial information actors at regional level through the Lounaispaikka network in South-West Finland and developed an interactive service tool to allow the general public to engage in regional planning. These tools are being transferred between the three participating countries and the project team has already secured funding for their future use.

URBAN PLANNING

Two other case studies demonstrate LIFE programme support for the development of spatial planning tools to aid urban development:

The PRE-SUD project (**LIFE00 ENV/UK/000891**), led by the Newcastle-upon-Tyne City Council in the north of England, built upon a peer review methodology, developed by the OECD, to create a pan-European tool for measuring and promoting the sustainable development of Europe’s cities. The comprehensive peer review tool, comprising a set of ‘sustainable development theme tables’, enables cities to report their current situ-



Photo: LIFE02 ENV/E/000176

The creation of green corridors is a way of reinforcing biodiversity in urban areas

ation to each other for peer assessment. Based on the peer recommendations, each city developed SMART action programmes that aimed to deliver 10-25% improvements in sustainability performance. Three of the cities that took part in the performance assessments have continued implementing their SMART action plans, and the tool is now being tested by the City of Aalborg in Denmark.

A second case study is the ‘DIVERS’ project (**LIFE02 ENV/E/000176**) led by Barcelona City Council. The project developed tools and a shared database to aid strategic urban planning for a more sustainable city. Piloted in five cities - in Spain, Greece (Athens) and Italy the project aimed to:

- analyse information contained in the different aspects of the urban system in terms of biodiversity;
- determine the relationship between urban diversity and competitiveness and between urban complexity/sustainability – i.e. to aid the development of urban strategies based more on information and less on the consumption of resources; and
- promote a network of cities to manage knowledge in an interactive way – examining participating cit-

ies’ resources in terms of urban sustainability.

This project’s tools were successfully developed and applied for the first time at different levels (local, regional, national and international). Their demonstration value is high as, according to the beneficiary, a similar strategy and methodology can be applied in almost every city using online databases.

BUILDING GREEN INFRASTRUCTURE

Urban sprawl and transport infrastructure projects have been known to cause the fragmentation of Europe’s landscape, with negative impacts on the environment, on biodiversity and ecosystems. A number of LIFE projects have provided support to LRAs as they work to introduce ecological networks, or to develop urban green areas in Europe.

The LIFE Cheshire Econet project (**LIFE99 ENV/UK/000177**) developed a model that integrates environmental considerations into sustainable land-use planning and management through the use of an ecological network. The project, led by Cheshire County Council,

used the latest Geographical Information Systems (GIS) technology, digital aerial photography and landscape ecology to analyse the landscapes of the county of Cheshire and the regions of Abruzzo and Emilia-Romagna (Italy) and Gelderland (the Netherlands). This ecological network has helped the municipalities and land managers concerned to integrate environmental considerations into their land-use planning and management. The model can be easily applied in other, similar European locations.

A Spanish LIFE project (**LIFE02 ENV/E/000200**) helped to contain the fragmentation of natural landscapes and habitats in Gallecs – a rural area on the outskirts of Barcelona – by promoting more environmentally sustainable use of the urban and peri-urban land. The project developed, for example, an area of wetland and restored degraded river and coastal areas. These and other restoration actions demonstrated that it is possible to achieve environmentally, socially and economically sustainable development in transition zones, such as Gallecs, which face increasing land-use and industry pressures emanating from neighbouring cities.

The 'Urban woods' project demonstrated new means of managing urban woodlands in a sustainable manner, while increasing their recreational value.



Photo: LIFE00 ENV/S/000868

Pilot recreational sites were established in 14 urban forest/woodland areas close to the cities of Stockholm and Paris

Also located on the outskirts of Barcelona, the 'Green belt' project (**LIFE00 ENV/E/000415**) successfully developed a model for sustainable land-use planning – creating green areas in order to limit the impact of urban sprawl from the city. Restoration actions to increase biodiversity and provide recreational services were carried out over three areas of between 8 and 10 ha.

URBAN GREEN AREAS

The following case studies demonstrate initiatives, co-funded by LIFE, to improve the quality of life in Europe's cities by the development of urban green areas:

The majority of Europe's urban population have become alienated from the woodlands that were once their natural environment. A Swedish-French project demonstrated new means of managing urban woodlands in a sustainable manner, while increasing their recreational value. The 'Urban woods' project (**LIFE00 ENV/S/000868**) helped establish pilot recreational sites in 14 urban forest/woodland areas close to the cities of Stockholm and Paris. Environmental conditions were improved by tidying, keeping the areas free of disturbance and by channelling the flow of visitors along defined paths.

Managing such nature sites located close to urban areas requires a high degree of citizen involvement. In Sénart (near Paris), the project brought together representatives from 14 municipalities and 150 different organisations to agree on long-term objectives for the development of these areas. Some 50 meetings resulted in an agreed framework document regulating all activities within the sites. Although this participative process took over two years, the



Photo: LIFE00 ENV/S/000868

municipality, forest managers, private landowners, NGOs and the community reached agreement on the development objectives for the forested area, and a consensus was reached on management operations and recreational activities that would previously have caused conflict.

An earlier initiative located in Belgium, the LIFE 'Urban forest' project (**LIFE99 ENV/B/000650**) aimed to plant a 200 ha forested area close to the industrial city of Ghent. Although only a small section (3.5 ha) was completed during the project, the afforestation – mainly using native tree species well-adapted to the humid climate – has continued after LIFE. The project has had a positive impact on the area's biodiversity and on citizens' quality of life in a region formerly lacking in forested areas. Moreover, a communication model developed by the project, encouraging networking and a participatory approach, has generated considerable interest among other municipalities and provinces.

Another promising example is the ongoing Spanish LIFE project (**LIFE08 ENV/E/000097**): an innovative scheme to develop a new management model for urban green areas focusing on the importance of plants, especially trees, in our cities. The model being developed in the city of Jerez de la Frontera

The Urban Forest project positively impacted the biodiversity and quality of life of a Belgian region formerly lacking in forested areas



in Andalusia, will promote in particular the environmental benefits to be gained from such urban green areas, such as temperature moderation, noise abatement and improvement of air quality.

INTRODUCING ICZM

The need for Integrated Coastal Zone Management (ICZM) is one of several priority areas highlighted by the EU as key to achieving a balanced and sustainable spatial development policy in Europe. The following two projects illustrate how coastal municipalities in Italy and Finland respectively, have worked together towards this key objective:

The Italian ETICA project (**LIFE04 ENV/IT/000488**) successfully developed environmental goals for the protection of seven coastal municipalities in Teramo – a province of the Abruzzo region that is heavily dependent on income generated from coastal tourism. A principal objective was to establish shared goals for the protection of the municipalities' principal income source – namely their renowned beaches (in 2005 the region had 10 Blue Flag beaches). A further goal was to introduce the EU's EMAS¹ environmental management system in the participating municipalities. As a result of the project, two municipalities successfully adopted EMAS, and a further three came very close to achieving registration. Five of the seven municipalities also obtained ISO 14000 certification². In addition, large quantities of data were collected on the integrated management of the coastal area. As a result, all participating municipalities now have a complete and up-to-date environmental database.

A dynamic systems model was drawn up and tested in order to identify the relations between local needs and tourism development. This simulation gives public administrators and local

¹ EMAS - the Eco-Management and Audit Scheme (Council Regulation 1221/2009), is a voluntary initiative designed to improve companies' environmental performance.

² ISO 14000 is a series of environmental management standards developed and published by ISO (International Organisation for Standardisation).



stakeholders a better understanding of the impact of environmental policies on tourism and the jobs market and has helped them in their planning processes.

Another success story is the Finnish COASTRA project (**LIFE00 ENV/FIN/000666**). Led by the regional council, the project covered South-west Finland's coastal waters (Baltic Sea Archipelago) and their drainage areas (a topographically complex archipelago with more than 2 000 islands and some 12 000 km of coastline). The coastal waters are characterised by low salinity, with high summer temperatures and ice-cover during the winter. The coastal areas meanwhile, face conflicts between economic and recreational activities and need to balance the demands of tourism with those of nature conservation. The main economic activities are fishing and fish farming, as well as specialised agriculture, e.g. animal husbandry. Sea transport and land transport are important contributors to pollution in the region. The permanent population is only around 30 000 people, but the area also has some 20 000 summer cottages, which means that the population is considerably increased during the summer months.

The project developed and implemented innovative and effective measures for ICZM in the region. A key aspect was the inclusion of participatory planning – involving relevant stakeholders at all stages. This has resulted in a framework for decision-making that takes account of the region's special circumstances. The strategy helps to preserve the region's (traditional) lifestyle and economic activities, while at the same time, tackling the need for environmental protection.

SUN lights the way for community engagement in spatial planning

Fragmented urban green spaces risk equally fragmented management, to the detriment of the wildlife that depends on them. The LIFE SUN project demonstrated how local authorities can make a positive impact by engaging local community groups both in strategies for biodiversity protection and in delivering action on the ground. The project agreed four local Biodiversity Action Plans and enhanced more than 70 urban green spaces.

Green space is an integral and vital element of the urban environment. Many urban areas contain zones of clear and significant environmental importance, such as parks, wetlands or woodlands. Their management in the face of conflicting social, economic and environmental needs is one challenge facing local authorities (LAs).

However, many green spaces are fragmented and only have local interest, such as playgrounds, private gardens, cemeteries and sports grounds. Biodiversity in these pockets of green space often faces tremendous threats from development pressures. LAs can also play an important role in their management by effectively involving stakeholders in biodiversity planning.

The LIFE Environment SUN project, run by the London Borough of Sutton, showed how stakeholder participation tools could be used to improve management of urban green spaces. It demonstrated tools for developing Biodiversity Action Plans (BAPs) with community groups and engaging local communities in innovative green space improvement projects. SUN also involved four other London boroughs, an Italian environmental organisation working on behalf of the City of Rome and a sustainable development consultancy.

PRODUCING BIODIVERSITY ACTION PLANS

A Biodiversity Action Plan is a strategy document outlining local plans for



The SUN project is a good example for other LRAs of what can be achieved through coherent strategies and action in support of biodiversity in fragmented green urban areas

wildlife conservation and enhancement. The SUN project worked to develop new or updated plans for the participating LAs with full stakeholder involvement and support.

To engage local people in the process of developing BAPs, the partner LAs started by conducting an extensive survey of priority conservation issues, using questionnaires on websites, in magazines and at local events.

The project made particular efforts to reach out to local groups and organisa-

tions, including disability groups, faith and voluntary organisations, schools and colleges. LAs even contacted local police, photography groups, businesses, sports clubs and artists. In total, more than 7 000 individuals contributed to the consultation process.

To maintain the involvement of consulted groups, the LAs organised conferences, open days, workshops, individual meetings and training events. Further outreach efforts included posters and leaflets, press releases, attendance at local fairs and public presentations.

The project agreed criteria for appropriate local projects related to habitat and species management. The partner LAs put forward 60 possible projects that fitted these criteria to be run within SUN. This list was reduced to 40 projects that could be implemented with the resources available. This work and the eventual drafting or reviewing of the BAP was done by 'BAP working groups' which were "set up and revitalised with local stakeholders," as the beneficiary puts it.

All these activities ensured that local community groups had fully inputted their biodiversity priorities and project ideas into the plans. The final result was one of the project's big successes: the production of BAPs for Sutton, Richmond and Redbridge; the production of a biodiversity strategy for the City of Rome; and updated BAPs in Hounslow and Bromley.

BIODIVERSITY MICRO-PROJECTS

The project sought to go beyond merely drafting the BAPs and into community participation in their implementation. The project identified several benefits of this approach, including "Reduced management costs for the local authorities, access to additional specialist skills from stakeholders and increased commitment to local green spaces," explains project manager, Richard Harris.



Pond clearance at the Eco Centre in Sutton

However, community responsibility for project implementation is not a straightforward objective for local authorities to achieve. Most partner authorities found that they needed to supply a staff member to act as a face-to-face liaison with local groups to support them in their work. This led to many successful micro-projects which can, in themselves, be used as good practice examples.

An ambitious activity in Sutton saw volunteer groups work to restore suitable habitats for the water vole (*Arvicola amphibious*), which had disappeared from the local river. The water vole is one of the flagship species of Sutton's BAP. Groups of young people reshaped riverbanks, planted suitable food and checked for the vole's main predator – the American mink. The young people received practical training for these activities and also developed their skills

and confidence through presentations of their work at events.

One small activity saw the creation of a cardboard garden in the grounds of a school. The school had almost no green space, with a tarmac playground, and was located in an area of green space deficiency in Redbridge. It fitted recycled cardboard tubes into hessian sacks, which were then filled with shingle and topped with compost from a nearby community garden. Schoolchildren planted these structures with various crops, and later ate a harvest meal with what they had grown.

Another micro-project involved schools, local groups and residents in restoring and enhancing the green space around a river in Bromley. They planted wildflowers and native trees in road verges and grounds and put up boxes for bats, birds and bees. A pack of walk activities was developed to encourage children and families to take greater notice of wildlife along the river.

MAINTAINING COMMUNITY INVOLVEMENT

Activities to directly improve the environment were only one aspect of the long-term approach adopted by the SUN project. As Richard Harris explains, "Getting people involved through education and awareness-raising was important to retain the level of initial participation." Outreach efforts were continued, a number of public walks and practical conservation task days organised and community groups led awareness-raising activities.

The project partner in Italy developed an educational activity based around river trips on the Tiber to increase awareness and understanding of biodiversity. Primary and secondary school pupils went on excursions to see the valuable habitats and range of wildlife living in and along the river. A total of 470 students from 14 schools took part during the project, with further activities to be carried out back in the classroom.

A wide range of activities was undertaken in the context of the SUN project, including successful community art

*Kidney vetch (*Anthyllis vulneraria*)*



schemes: a six-week community project in Hounslow involved old and young people and people recovering from mental health problems who, with the support of a professional artist, created and exhibited art inspired by the local natural environment; in Richmond, a local artist helped schoolchildren to create a biodiversity sculpture out of recycled materials supplied by the recycling section of the local council. The sculpture contained most of the species within Richmond's BAP, raising awareness of the plan and local biodiversity issues, as well as of recycling and litter.

"BIODIVERSITY BY STEALTH"

A challenge identified by the project was that many local people can be put off events with the word 'biodiversity' in their title, assuming them to be technical events or only for environmental specialists. The project manager remembers that "Biodiversity by stealth" was a term we coined to describe biodiversity activities promoted or designed in such a way as to be non-technical and as inclusive as possible."

Participation in decision-making and implementation increased ownership of green spaces by the local community



The six-spot Burnett moth (Zygaena filipendulae)

In many cases this involved organising activities aimed at raising awareness of biodiversity issues, but sold to the public on other grounds. Bromley targeted walkers and ramblers groups with a walking festival that also included information on biodiversity issues. A tree festival in Sutton included a free climbing wall and the chance to watch a tree surgeon climb a local landmark plane tree as well as biodiversity stands.

Some events were organised to coincide with important dates, such as a guided walk focusing on mistletoe and a tree-planting event, both on Valentine's Day. Other events focused on sometimes hard to reach groups. For example, an activity in Hounslow engaged ethnic minority groups around local wildlife issues through art and drama.

Overall, the involvement of so many small community groups allowed the project to directly enhance more than 70 urban green spaces. However, the project hopes to leave an even greater legacy, as biodiversity manager of Sutton Council, Hendryk Jurk, explains: "The adoption of the BAPs and the resulting network and actions to improve biodiversity is probably the biggest legacy of the SUN Project. The BAP is now the main driver to attract new audiences as well as engaging with existing groups."

The SUN project demonstrates to other local and regional authorities what can be achieved in terms of coherent strategies and action in support of biodiversity in fragmented urban green spaces. The inclusive approach creates a positive cycle with groups more readily engaging with future biodiversity projects and increased ownership of green spaces by the local community. It can also play an important social role, engaging disadvantaged or isolated groups in community activities and boosting their confidence and skills.



ENGLAND

Project number: LIFE03 ENV/UK/000614

Title: Sun - Sustainable Urban Planning Networks for green spaces

Beneficiary: London Borough of Sutton

Contact: Hendryk Jurk

Email: Hendryk.Jurk@sutton.gov.uk

Period: Sept-2003 to Aug-2006

Total budget: €1 824 000

LIFE contribution: €910 000



Projects developed by **local and regional authorities**

The table below provides examples of LIFE projects mentioned in this publication that have been developed by LRAs. For more information on individual projects, visit the online database at: <http://ec.europa.eu/environment/life/project/projects/index.cfm>

Project Reference	Acronym	Title	Page
TRANSPORT			
LIFE02 ENV/IT/000106	RAVE	★ The Green Ray of Novara	8
LIFE98 ENV/B/000269	Make Brussels bicycle friendly	Make Brussels bicycle friendly	8
LIFE04 ENV/IT/000547	Freeway	Demonstrating the reduction of greenhouse gases and air pollution through a homeostatic mobility planning aiming at road traffic balancing	8-9
LIFE05 ENV/E/000262	GESMOPOLI	★ Integral mobility management in industrial estates and areas	9
LIFE08 ENV/IT/000425	Under the Etruscan sun	Environmental friendly Transport to RedUce Severe Climate change ANthropic factors	9
LIFE07 ENV/IT/000434	MHyBus	Methane and Hydrogen blend for public city transport bus: technical demonstrative application and strategic policy measures	9
LIFE06 ENV/A/000345	SPAS	Sound and Particle Absorbing System	10-11
LIFE02 ENV/F/000295	GlpSyNOISE	An efficient GIS tool oriented to meeting the objectives of the European DAMEN (Directive on the Assessment and Management of Environmental Noise)	10
LIFE00 ENV/A/000240	GOAL	Graz: Noise and emission reduction through the promotion of alternative means of transport for the citizens personal well-being	10
LIFE06 ENV/D/000477	PARFUM	Particulates, Freight and heavy duty vehicles in Urban Environments	10
LIFE05 ENV/IT/000870	CEDM	★ Centre for the Eco-Friendly City Freight Distribution	11
LIFE02 ENV/GR/000359	IMMACULATE	IMprovement of Urban Environment Quality of Air and Noise Levels by an Integrated, Cost Effective and MULti-Level Application of Clean Vehicle Technologies	11
LIFE06 TCY/ROS/000269	KALAIR	Kaliningrad Air Pollution induced by traffic: modeling system design, installation and validation	11
LIFE04 ENV/AT/000006	KAPA GS	Klagenfurt's Anti-PM 10 Action Programme in co-operation with Graz and the South Tyrol	12-14
WASTE			
LIFE08 INF/E/000187	COR	Waste Objective Campaign	18
LIFE05 ENV/F/000063	Ideal 79	★ Sustainable Initiatives and Local Alternatives towards waste prevention	19
LIFE98 ENV/GR/000211	Kalamata Waste	Development and adjustment to the Mediterranean conditions of an integrated system for waste collection and recycling	19
LIFE04 ENV/DE/000056	ZAK-process	'Realisation of a 100.000 Mg/a plant with the newly developed ZAK-process with the aim to produce economically from domestic waste of high-value, quality-optimized, secondary combustible material.'	19
LIFE99 ENV/B/000640	Rcycl	Rcycl	19
LIFE02 ENV/E/000269	AUTOREWASTE	Automatic system for selective recovery of waste	19
LIFE03 ENV/P/000506	REAGIR	★ Recycling and re-use of CDW as a part of Integrated Waste Management	20
LIFE08 ENV/F/000486	Miniwaste	Design, implement and assess an innovative and sustainable plan to minimise municipal organic waste in EU States	20
LIFE00 ENV/E/000543	COMPOST-DISSEMINATION	★ Co-composting procedures and its use on afforestation, landscaping and forestry and agricultural crops in the Andalusian region	20
LIFE03 ENV/GR/000205	COMWASTE	Promotion and Implementation of Systems for the Production of High Quality Compost from Biodegradable Household Waste separated at Source	20
LIFE03 ENV/LV/000448	Bio Waste	Treatment of Biodegradable Organic Municipal Waste Using Composting Technologies	21
LIFE00 ENV/E/000484	PC-NEW	Personal computers new equipments	21
LIFE00 ENV/GR/000688	Sumaneweg	Sustainable Management of E-waste in Greece	21
LIFE00 ENV/IRL/000764	HEATSUN	Community-Based Action for Prevention, Re-use and Recycling of Waste Electrical and Electronic Equipment	21
LIFE05 ENV/FIN/000539	WastePrevKit	Waste Prevention Kit for enterprises, education and households	22-24
CLIMATE CHANGE			
LIFE07 ENV/IT/000451	LAKs	Local Accountability for Kyoto Goals	28
LIFE02 ENV/GR/000362	MedClima	Climate Alliance for Mediterranean Cities	29
LIFE07 ENV/GR/000282	CLIM-LOCAL2020	Developing Local Plans for Climate Mitigation by 2020	29
LIFE08 ENV/IT/000430	FACTOR20	Forwarding ACTIONS On a Regional and local scale to reach UE targets of the European Climate Action Plan "20-20 by 2020"	29
LIFE03 ENV/UK/000611	RESPONSE	Responding to the risks from climate change	29

Project Reference	Acronym	Title	Page
LIFE08 ENV/LV/000451	HydroClimateStrategyRiga	Integrated Strategy for Riga City to Adapt to the Hydrological Processes Intensified by Climate Change Phenomena	29-30
LIFE07 ENV/FIN/000145	Julia 2003	Mitigation of and Adaptation to the Climate Change in the Helsinki Metropolitan Area - From Strategy to Implementation	30
LIFE08 ENV/IT/000436	ACT	Adapting to climate change in Time	30
LIFE07 ENV/FIN/000138	CHAMP	Climate Change Response through Managing Urban Europe-27 Platform	30
LIFE08 ENV/E/000109	ALICCIA	Integrated Management System: an innovative strategy at the municipal level for the policy and governance of climate change	30
LIFE08 ENV/E/000101	Las Rozas por el clima	Local Action Plan for Fighting Climate Change in Las Rozas de Madrid: Application and Evaluation of Municipal Management Methods	30
LIFE07 INF/IT/000487	R.A.C.E.S.	Raising Awareness on Climate change and Energy Savings for teachers, families and stakeholders	31
LIFE08 ENV/S/000269	CLEANTRUCK	CLEAN and energy efficient TRUCKs for urban goods distribution	31
LIFE05 ENV/P/000369	OIL PRODIESEL	★ Integrated Waste Management System for the Reuse of Used Frying Oils to Produce Biodiesel for Municipality Fleet of Oeiras	31
LIFE07 ENV/IT/000388	CARBOMARK	Improvement of policies toward local voluntary carbon markets for climate change mitigation	31
LIFE07 ENV/S/000908	GreenClimeAdapt	Green tools for urban climate adaptation	31
LIFE04 ENV/IT/000453	ROMAPERKYOTO	Realization of Rome's Action Plan to achieve the Kyoto's Protocol objective of Green House Gas Reduction	32-34
WATER			
LIFE07 ENV/IT/000475	TRUST	Tool for regional - scale assessment of groundwater storage improvement in adaptation to climate change	38
LIFE08 ENV/E/000099	AQUAVAL	Sustainable Urban Water Management Plans, promoting SUDS and considering Climate Change, in the Province of Valencia	39
LIFE06 ENV/DK/000229	TREASURE	★ Treatment and re-use of urban stormwater runoff by innovative technologies for removal of pollutants BoB 2010	39
LIFE02 ENV/E/000183	DROPWATER	Durable Regions On Peripheral Areas for Water Reduction	39
LIFE00 ENV/EE/000922	RAKWANET	Demonstration Activities for the Reduction of Water Losses and Preservation of Water Quality in Over-dimensioned Water Distribution Network in Rakvere Town, Estonia	39
LIFE03 ENV/H/000280	SUMAR	Sustainable use and management rehabilitation of flood plain in the Middle Tisza District	40
LIFE04 ENV/HU/000382	SZIGETKOZ-PROJECT	Implementation of an innovative Decision Support Tool for the Sustainable water and land-use management planning and Flow Supplementation of the Hungarian-Slovakian Transboundary Danube Wetland Area (Szigetköz)	40
LIFE07 ENV/B/000038	WALPHY	Design of a decision tool for hydromorphological restoration of water bodies in Walloon Region'	40
LIFE02 ENV/UK/000144	Smurf	★ Sustainable Management of Urban Rivers & Foodplains	41
LIFE00 ENV/E/000539	ACUÍFERO TORDERA	Sustainable management, at local level, of the alluvial aquifer of the River Tordera, through the reuse of waste water	41
LIFE03 ENV/F/000257	RECYCLAQUA	★ A new sewage treatment process: the vermifiltration. Demonstration-dissemination technically and environmentally integrated	41
LIFE06 ENV/NL/000167	WET	★ Wastewater & Effluent Treatment	41
LIFE06 ENV/D/000461	FLOODSCAN	Large scale adjustment of new technology for fast, precise and cost-efficient hydraulic 2d-modelling of flood (hazard) areas by combining laser scanning with remote sensing data	42-44
SPATIAL PLANNING			
LIFE04 ENV/FI/000304	ENVIFACILITATE	★ Integration of spatial environmental information across different themes, scales, resolutions and uses: added value of facilitating mechanisms	49
LIFE00 ENV/UK/000891	PRE-SUD	Peer reviews for European sustainable urban development	49
LIFE02 ENV/E/000176	DIVERS	Information, Competitiveness and Sustainability in Urban System	49
LIFE99 ENV/UK/000177	Cheshire Econet	A demonstration model which integrates environmental considerations in sustainable land use planning and management through the use of ecological networks	49
LIFE02 ENV/E/000200	GALLECS	Demonstration project on land use and environmental management of the physical planning in Gallecs as a biological and stable connector in the fringe space of Barcelona metropolitan area	50
LIFE00 ENV/E/000415	Green Belt	A proposal for sustainable territorial planning	50
LIFE00 ENV/S/000868	Urban Woods	Demonstration of ways to increase peoples recreational benefits from urban woodlands	50
LIFE99 ENV/B/000650	Urban Forest	Development of a model for local authorities to implement a policy concerning sustainable environmental planning in urbanised areas, based on a case study: an urban forest for Gent	51
LIFE08 ENV/E/000097	JEREZ + natural	Innovative management model of urban trees in the city of Jerez de la Frontera	51
LIFE04 ENV/IT/000488	ETICA	EMAS for tourism in internal and coastal area: integrated management	51
LIFE00 ENV/FIN/000666	COASTRA	Coastal management strategy for Southwest Finland	51
LIFE03 ENV/UK/000614	SUN	Sustainable Urban Planning Networks for green spaces	52-54



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