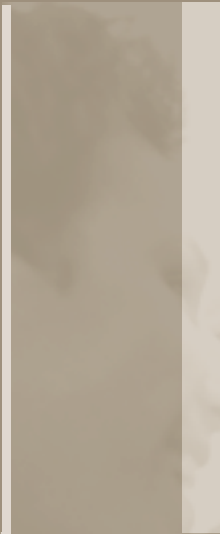




EUROPEAN  
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## EU RESEARCH FOR SUSTAINABLE URBAN DEVELOPMENT AND LAND USE SUSTAINABLE MANAGEMENT



# TODAY'S PLAN, EUROPE'S FUTURE |

GENERAL INFORMATION

EUR 21158

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# RUNNING CITIES THE SUSTAINABLE WAY

A sustainable world depends on partnership – between producers and consumers, and between governments and voters. In cities like Birmingham, municipal authorities and the citizens they serve work together to achieve economic prosperity in ways that respect the environment and the needs of the city's future inhabitants.

'Think globally, act locally' must be the watchword for those who run our towns and cities. The tools and methods created by European research have already given us practical help to improve Birmingham's sustainability. The city's involvement in European research has highlighted the importance of strategies that cover the metropolitan area as a whole, and its city-region partnership with neighbouring authorities has been cited as an example of good practice by a recent UK Government report – showing how the benefits of European research networks extend beyond their direct participants to a much wider audience.

The involvement of citizens is vital in alerting public authorities to the changing needs, aspirations and problems of their local area, so that appropriate improvement measures can



be discussed, evaluated and planned. When people feel that they can really influence decisions that affect their locality, their commitment to the process of consultation and to the implementation of the resulting strategies increases dramatically.

Europe's cities have a wonderful cultural heritage, and can be thrilling places. They are also vital commercial centres which generate jobs and wealth. But they are often crowded, noisy, congested, dirty, and even dangerous. The challenge is to mitigate these negative aspects without losing the dynamism that makes people want to live, work and play in cities.

Europe is developing a strategy for running its cities in a way that enhances their environment and preserves their resources. As this brochure explains, the strategy is underpinned by a significant research effort, which is furnishing policy-makers and practitioners with tools and approaches that will help to entrench best practice and enable citizens to participate in decision-making.

*Sir Albert Bore*

LEADER, BIRMINGHAM CITY COUNCIL,  
FIRST VICE PRESIDENT OF THE EU COMMITTEE OF THE REGIONS

# STRATEGIES FOR SUSTAINABLE CITY LIFE



The principle of sustainability – that economic growth must not compromise the condition of the planet for future generations – has become a cornerstone of European policy. This concern for the local and the global environment, following the 1992 Rio Summit, led the Gothenburg European Council of 2001 to adopt the European Union Strategy for Sustainable Development<sup>(1)</sup>. The continuing shift of populations from the country to the city makes sustainability in the urban environment a particular challenge.

## City limits

Within the EU's Fifth Framework Programme for Research, the key action 'City of tomorrow and cultural heritage' is giving local and regional actors – policy-makers, practitioners and citizens – the knowledge, concepts and tools they need to engage in informed, participative decision-making and to implement its results successfully. These are the actors whose strategies for sustainable development will largely determine the quality of life of the 80% of EU citizens now living in urban areas.

Research results helped the Commission's Directorate-General for Environment to develop its Thematic Strategy on the Urban Environment<sup>(2)</sup>, part of the EU's Sixth Environment Action Programme. The strategy will target all towns with more than 100 000 inhabitants, producing guidelines that will encourage their local authorities to introduce and run sustainable management systems. A central focus of research has been to develop improved tools to support decision-making, and these will make an important contribution to the implementation of such systems.

Towns are colossal users of natural resources. They need energy to move people about, to warm their homes and to power their tools and their toys. And they generate

equally vast quantities of waste. Life in cities must be managed in a sustainable way or consumption will outrun the supply of resources, while pollution makes life itself unbearable. Management systems have to integrate financial, social and environmental objectives and constraints into a comprehensive set of measures, and must incorporate mechanisms to ensure that local concerns are taken into account. Only then will individual citizens be willing to commit themselves to the sustainable management of their own areas.

## Focus on change

In developing its Thematic Strategy on the Urban Environment, the Commission undertook a consultation exercise in which any concerned citizen or expert was invited to contribute ideas and comments. The Strategy has four priority themes – urban environmental management, urban transport, sustainable construction, and urban design. Its premise is that the knowledge and technologies needed to bring about significant change already exist – and that the principal challenge now is to help towns and cities exploit this knowledge in order to implement strategies for sustainability. The Expert Group on the Urban Environment is being expanded to advise on the final content of this Thematic Strategy, and will draw extensively on the results already delivered by research.

(1) COM(2001)264 final

(2) COM(2004)60



## Governance

Urban sustainable management policies will only work if citizens co-operate. Choosing to use public transport or to separate waste for recycling – these are personal decisions. But when people have been involved in shaping policy, they are more likely to feel ownership of the practical measures that are introduced. Public authorities' traditional 'top-down' strategic planning is beginning to be replaced by the concept of governance. This consensual approach applies to the exercise of power not only by national and local authorities, but also by courts, tribunals and many less formal networks and groups.

The EU's white paper, Governance in the EU<sup>(3)</sup>, considers the way the Union uses the powers granted to it by its citizens. The concept of governance encourages greater openness and accountability in policy-making, and is a key element of the framework for sustainable urban management. The challenge is to establish mechanisms for consulting those who live or work in or near Europe's cities, and to provide them with the information they need to contribute to the sustainable management of their environment.

(3) COM(2001)428 final

## Saving resources

Good practice in urban governance will help to develop sustainable and workable policies on issues such as air pollution and waste management. The concentration of populations in cities brings an inevitable risk of pollution, and poor air quality is a major health risk with complex causes and a real economic cost. Mitigation demands active monitoring and reduction measures that may require citizens to make lifestyle changes. Cities generate increasing volumes of waste which may also affect public health, and more sustainable disposal methods are urgently needed. Again, citizen participation is vital if significant waste reduction is to be achieved.

Once systems for sustainable management have been created, there is a need for training among those responsible for using them, from administrators to operatives and consumers.



Sustainable management is a consultative process – city planning in Dublin.

# TOMORROW'S WORLD, TODAY

**EU research on sustainability, like other elements of its environmental programme, has its roots in Agenda 21, agreed at the Rio Earth Summit in 1992 and strongly reinforced at Johannesburg ten years later. New EU directives to improve air quality and waste management have also provided research with a strong impetus.**

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TODAY'S PLAN, EUROPE'S FUTURE

Agenda 21 is a comprehensive plan of action to be taken at every level from global to local, wherever human activity has an impact on the environment. It has inspired local and regional authorities worldwide to start environmental planning in towns and cities. The Commission's approach has been to synthesise the best of these actions, and to coordinate information exchange and the sharing of good practice developed by European local authorities. As a way to introduce sustainable management, this has already proved far faster and far cheaper than developing new tools from scratch in every city where they are needed.

EU research has consistently support sustainable development strategies at European, national, regional and city levels, producing new approaches, specific policy recommendations and practical decision-support systems including indicators, external cost evaluation methodologies, and sustainability thresholds. Within FP5's key action 'City of tomorrow and cultural heritage', the theme of sustainable city planning and rational resource management is directed at improving the quality of city life and urban decision-making processes, while enhancing competitiveness and creating jobs.



Reclaimed land in Stoke-on-Trent, United Kingdom, has been turned into a popular park.

## Get stuck in

The process of urban and regional decision-making oriented towards sustainability is necessarily complex, since it involves multiple stakeholders within public authorities, among the business and NGO communities, and in the wider public. A major objective of EU research has been to find ways of increasing participation, and various projects have sought to develop best practice in 'sustainable governance', using participative approaches and public-private partnerships to secure the active involvement of all relevant stakeholders. Interactive networks, databases and newsletters, scenario workshops and simulation tools have all been applied in cities and towns with extremely diverse local problems, often employing websites to encourage public access.

Levels of community participation are closely linked to strong local political leadership, which can also encourage the democratic process, while best practice examples serve as models and help to raise overall standards.

# DELIVERING SUSTAINABLE MANAGEMENT

Support for informed decision-making is at the heart of all EU research. Within the 'City of tomorrow and cultural heritage' key action and in other parts of FP5's Environment programme, tools and systems have been developed to support more sustainable management of cities and their regions.

## Calculation before action

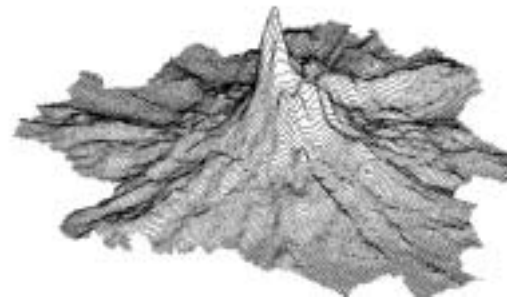
City management can only proceed in a sustainable way if the effects of new policy measures are explored and understood before they are introduced. Several years of work to develop a procedure for analysing the impact of policy decisions on sustainability has led to a framework for the assessment of any activity that affects an ecosystem. Impact assessment can help policy-makers to design sustainable development strategies by generating threshold values which show the level at which particular activities would become damaging.

Impact analysis and assessment – calculation of the environmental effect of a major construction project, for example – are familiar processes. In the urban environment, a strategy for sustainable management must take into account not only its financial costs and benefits but also its potential environmental and health impacts, and its social acceptability. Ideally, a policy will be formulated after public consultation and the assessment of good practice examples, and should be tested before it is implemented.

Testing techniques include scenario development, cost-benefit and cost-effectiveness analyses, technology assessment, and an overall synthesis of as many of these factors as possible. Once introduced, a policy must be monitored to check that its impacts were correctly predicted. The result may require strategic objectives to be re-examined, but a policy that passes this hurdle becomes an example of good practice that can be offered to other cities as a model for sustainable management.

## Everything has its price

An essential element of such cost-benefit analyses is their ability to place a monetary value on potential economic, environmental and social costs and benefits, whether they arise from action or from the absence of action. The calculation of an activity's own 'internal' costs is well understood – a power plant's capital costs, raw material and running costs determine the price of the electricity it produces, for example. But hidden costs, or 'externalities', must also be taken into account. These include the effect of emissions to the air on human health, groundwater, biodiversity and climate change, the disposal of waste products and the decommissioning of the plant at the end of its working life. These costs may be hard to determine, and research is needed to provide the tools and quantitative data to support calculations.



Computer-based visualisation tools are an important aid to effective decision-making.



## RED for go

**Considerable research** effort has been devoted to the valuation of external costs, and the Commission has set up a project to collect and assess this data, and to make it available for impact analyses. The database of the Review of Externalities Data (RED) project draws on an extensive search of research literature in Europe and around the world.

Because these have been most widely studied, RED has so far concentrated on the environmental externalities of power generation, transport and waste. However, its scope is being extended to industry and agriculture – for example, by the FP6 project, Methodex. Its values can be transferred from one situation to another and combined in various ways to calculate the cost to the environment of a unit of pollution, or the health damage of generating a unit of power by various alternative means. Policy-makers and planners – even at local level – can use RED to price competing technologies in a way that takes account of their long-term environmental impacts as well as their capital and operating costs.

**Further information** | <http://www.red-externalities.net/>

The ExternE series of EU-funded projects showed that the price of electricity produced from coal would more than double if the external costs of damage to the environment and health caused by air pollutants were taken into account. Even the externalities of natural gas would add approximately 30% to the costs of electricity generation. Since they do not appear on electricity customers' bills, such external costs must be met by society at large. The EcoSense software produced by the project can be used to calculate externalities for electricity generation and transport, and also to evaluate innovative technologies.

The RED project has been collecting external pricing data for use in sustainable development planning and management. It provides a valuable input to the cost-benefit analysis needed for successful impact assessment (see *RED for go*).

## | The air that we breathe

City centre air is burdened by fumes from traffic, from heating and ventilation systems, and from manufacturing activities. In hot weather, eye-smarting smog may form. Since urban air quality has a direct influence on the health both of people and of the built environment, clean air is a major focus of research.





Understanding the sources of air pollution and their interactions is a first step towards providing tools that will help to control and reduce the nuisance. Specifically, city managers need the help of such tools to meet the objectives of the Clean Air For Europe (CAFÉ) initiative, which will publish a strategy on air pollution as part of the EU's Sixth Environmental Action programme.

If Europe's political commitment to improving its air quality is to be met, urban management must raise local standards, and to do this it needs practical tools. To get a true picture of air quality, monitoring devices are needed that can measure pollutants such as oxides of nitrogen, particulates, aerosols and volatile organic compounds (VOCs), indoors as well as outdoors. New models of pollution dynamics are needed to predict and assess dispersion and impacts, particularly on health. The action plan of the Strategy for Environment and Health<sup>(4)</sup>, currently under preparation, will open new opportunities to strengthen and integrate environmental and health monitoring and information systems.

(4) COM(2003) 388 final

## Burning issue

The smell of fast-food outlets is a growing source of nuisance and complaint. Existing filtering systems often let particles and volatile organic compounds (VOCs) escape, and collect fat deposits creating a fire hazard. **Nozone** is developing an intelligent extraction system to deal with the full range of cooking fumes, which combines the best technology for dealing with each possible pollutant. It will have an electrostatic precipitator to remove solids and ultraviolet tubes to cut odour and sterilise both the emissions and the equipment itself.

The intelligence comes in the ozone that is generated to clean up fat and grease. The system must quickly produce exactly the right amount to remove the quantity of fat in the air stream, without leaving any residue over to pollute the vented air. Sensors will be used to link production to demand.

Nozone may find a market of up to 1.5 million units in larger catering establishments, and could create 800 jobs. It should also reduce catering industry fires by 3%, and will therefore avoid unnecessary deaths and injuries as well as improving urban air quality.

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## Slim waste

**AWAST** has produced a simulation tool to model all the factors that must be considered in deciding how to treat municipal solid waste (MSW). It covers the entire waste management chain from collection and transport to recycling and treatment, and includes the full range of technological options.

The simulation takes account of costs, social factors and energy balance. AWAST helps users to meet regulations and to make rational decisions on improving waste management. By enabling them to evaluate the efficiency of alternative methods such as biological treatment plants, the methodology allows them to define and plan sustainable progress.

AWAST will help European Member States to meet targets for reducing biodegradable waste sent to landfill and increasing the proportion of packaging that is reused or recycled. It also allows global monitoring of waste statistics so that authorities can benchmark their own performance against that of comparable cities.

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<http://awast.brgm.fr/>

The same work often leads to proposals for measures to curtail air pollution, with recommendations for legislation. The Cluster of European Air Quality Research (CLEAR) projects is creating tools to support urban governance as a path to improved quality of life for citizens. The Integaire project is developing a model that links this science to the needs of sustainable urban governance as an aid to decision-making. It is also identifying current knowledge gaps as the basis for recommending new topics for future research.

## Waste of space

European waste management initiatives will have the greatest impact in cities where the density of waste production is highest. EU policy seeks to extend the lifetime of landfill sites by reducing the permitted proportion of biodegradable waste, and will increase the recycling of packaging and reduce incineration emission limits. Public authorities will need to introduce more effective waste management systems, and research is delivering mechanisms to support them.

Minimising waste depends on the three 'R's – reduce, reuse and recycle. Surveys show that two-thirds of town waste goes to landfill and only 10% is recycled, so there is plenty of scope for improvement. Some European cities have practised waste reduction and management for years now and need tools to help them rationalise their technological and economic choices. Others are on the point of introducing genuine waste management and would benefit from links with more experienced partners.

To reduce resource use the sustainable procurement campaign, Procura+, has promoted 'green' purchasing through a range of projects, and has created a knowledge base that can be used by any authorities that want to improve their

performance. The European Waste Management Cluster offers waste solutions for sustainability through the Waste Solutions website<sup>(5)</sup>. This spreads news about good practice, the latest research and schemes to encourage sustainable urban management. One such scheme is Pay as You Throw (PAYT) which aims to reduce the bulk of garbage from high-density housing through variable charging. It gives households a financial incentive to recycle more and discard less, and offers tools for evaluating an area's suitability for such a scheme. A broader approach has been developed by the AWAST project (see *Slim waste*) which has produced software to evaluate options for treating municipal solid waste.

## | Citizen participation

Urban quality of life depends to a large extent on the specificities of local environment such as clean streets, green plants and the reliability of the bus service. A city that can mobilise citizens to participate in its governance is more likely to deliver policies and services that correspond to their aspirations – and to create neighbourhoods in which they are happy to live and work. EU research is helping to develop methods of urban governance that streamline improvements at district or local housing level. This approach demands leadership which not only asks people what their concerns are, but reacts to their answers in a positive way.

Many of the projects employed this participative approach. Others deal with governance directly and attempt to assess how far and how fast local governance is moving towards sustainable management. The Demos project (see *Local democracy at work*) links a network of city governments that have found innovative ways to mobilise citizen action. In Turku, Finland, schoolchildren decide what

(5) <http://www.wastesolutions.org/>



Children in Varissuo, Finland, joined in a scheme to clean up local graffiti.





they want changed in their locality and put ideas to the City Council. In Utrecht, the Netherlands, children were also encouraged to reveal problems unknown to the authorities. In the new Member States, Cracow has developed informal safe houses where young people with problems can go for some quiet time out.

Young people who have seen the value of direct action are more likely to remain active citizens as they enter adulthood. Another project, Participation, Leadership and Urban Sustainability (PLUS) is exploring the relationship between good leadership initiatives in cities and the degree to which citizens are active in their communities. It is looking at styles of leadership in nine countries, and will offer practical advice to politicians and officials in promoting the sustainable development of their cities. PLUS is one of several projects that encourage partnerships between urban managers and

researchers, and between public and private sectors. It has established a network for the exchange of information, experience and good practice, and involves experts in training to support the implementation of sustainable management strategies.

Local authorities need tools to monitor and assess their progress towards sustainability and the objectives of Local Agenda 21. Local Evaluation 21, developed by the Lasala-Online project, is a self-evaluation tool derived from an urban governance model which focuses particularly on eco-efficient city management. It has been tried out by around 200 public authorities and is available on-line for self-guided use by others. It has tremendous potential to improve conditions in cities and minimise their consumption of natural resources.



In Utrecht, the DEMOS project staged a play to stimulate public debate about local problems.

## Local democracy at work

The **DEMOS** project aims to combat citizens' apathy and cynicism about local government, and to encourage them to participate using innovative approaches to the improvement of their local situation. It links eight city councils across Europe, each working with a research organisation, to foster new ways of revitalising local democracy. Its 'bottom-up' approaches include interactive info-kiosks linking 11 Greek islands, and a theatrical production created in the city of Utrecht to dramatise a district's problems.

DEMOS' strength is that it involves people in policy-making at an early stage. It is far better to be involved in making decisions than to protest against them afterwards. Citizens have helped to decide what shops, transport and playgrounds they want and where. They are encouraged to take pride in their environment and to take democratic action. One finding is that the normal local authority area is too large and impersonal, and that an ideal neighbourhood has 10 000 people, or even fewer. DEMOS publishes regular newsletters to disseminate its findings.

**Further information** | <http://www.demosproject.org/>

## Further information

- | FP5's key action **City of tomorrow and cultural heritage**  
<http://www.cordis.lu/eesd/ka4/home.html>
- | Directory of all **research projects** funded by the key action (together with other relevant documents)  
<http://www.cordis.lu/eesd/ka4/library.htm>
- | 'Environmental Research' website on Europa  
<http://europa.eu.int/comm/research/environment/>
- | FP6's **Global Change and Ecosystems** priority thematic area  
<http://www.cordis.lu/sustdev/environment/home.html>
- | For specific enquiries concerning the activities presented in this brochure, please contact  
[rtd-sustainable@cec.eu.int](mailto:rtd-sustainable@cec.eu.int)
- | The **Sixth Environment Action Programme**, Environment 2010: Our Future, our choice  
<http://europa.eu.int/comm/environment/newprg/index.htm>
- | The **Environmental Technology Action Plan**  
<http://europa.eu.int/comm/environment/etap/index.htm>
- | The **European Union Strategy for Sustainable Development**  
[http://europa.eu.int/comm/sustainable/pages/strategy\\_en.htm](http://europa.eu.int/comm/sustainable/pages/strategy_en.htm)
- | **Towards a thematic strategy on the urban environment**  
[http://europa.eu.int/comm/environment/urban/thematic\\_strategy.htm](http://europa.eu.int/comm/environment/urban/thematic_strategy.htm)
- | **Impact Assessment**  
[http://europa.eu.int/comm/sustainable/pages/impact\\_en.htm](http://europa.eu.int/comm/sustainable/pages/impact_en.htm)
- | **Governance in the European Union**  
[http://europa.eu.int/comm/governance/index\\_en.htm](http://europa.eu.int/comm/governance/index_en.htm)
- | **Agenda 21**  
<http://www.un.org/esa/sustdev/agenda21.htm>

# CLOSING IN ON SUSTAINABILITY

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TODAY'S PLAN, EUROPE'S FUTURE

**Research is steadily improving the quality of local and regional governance. Further work is needed to place economic values on some of the less material components of sustainable policy-making. Together with further development of assessment methods and integrated tools, these are required to make possible the comprehensive evaluation of policy options in support of sustainable regional development – including mechanisms for costing new environmental technologies.**

Real progress has been made in developing sustainable urban management support tools, and some of these are already being used to enhance urban environments. The challenge now is to combine individual tools into integrated evaluation and management systems which local and regional authorities can use to improve their decision-making from the perspective of sustainability.

Most ecological research concentrates on natural habitats, and work still needs to be done on the effect of cities upon their immediate and wider surroundings.

Tools like eco-footprinting estimate the area of productive land needed to provide each human being with food, energy and raw materials. It may be possible to apply this concept to the allocation of urban resources. Another untried technique employs the proximity principle. This maintains, for example, that waste should be treated as close as possible to where it is generated, reducing transport costs and the risk of pollution and accidents. This principle could have a major impact on how we deal with urban supplies of water, energy and materials.

The principles of sustainable urban management have been widely accepted, but mechanisms are still needed for embedding them in the day-to-day activities of local government. Town planning, budgeting and economic planning could all be made more sustainable. A concerted effort to spread information about the available tools and systems is required to extract maximum value from EU research. Bureaucracy can be slow to change its outlook, so training will also be needed to introduce the new methodologies.

Thanks to EU research, urban and regional governance are making a real contribution to the EU's commitment to sustainable development. Research will continue to focus on the husbandry of global resources and improving the quality of life in Europe's cities.

## Dortmund Metropolitan Region

A decision-support tool developed by the Propolis project permits analysis of exposure to noise, by socio-economic group.



Population disturbed by traffic noise  
 34.2 percent of total population  
 39.8 percent of SEG1  
 34.1 percent of SEG2  
 31.2 percent of SEG3

European Commission

**Today's plan, Europe's future: EU Research for sustainable urban development and land use - Sustainable management**

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Managing the development of Europe's cities and regions in a sustainable way not only requires the optimisation of economic, social and environmental objectives, but also demands an appropriate balance between the interests of industry, citizens and other land users. This publication describes the practical support offered by EU research both to the decision-making process and to the implementation of sustainable solutions.



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