



Environment fact sheet:

A vital EU R&D programme for sustainable development



- Research and development are key to achieving sustainability by helping us understand and evaluate unsustainable patterns, by providing tools to analyse the effectiveness of different policy options, and by developing and demonstrating cleaner technologies.
- Since the early 1980s, the European Union has financed R&D aimed at enhancing sustainability, putting sophisticated impact assessment and monitoring tools as well as state-of-the-art research findings at the disposal of policymakers and stakeholders in and beyond Europe.
- The EU's renewed and strengthened sustainable development strategy will further focus research efforts to achieve greater sustainability in the EU and globally. The EU is determined to continue to break new ground, moving society forward while protecting the natural world and its resources.

Fact 1: Research and development are key to achieving sustainability

Environmental problems such as climate change, species loss, ozone depletion, air pollution and water contamination require long-term strategies, urgent action and the rapid, efficient and targeted conversion of new knowledge into socially, economically and environmentally acceptable solutions.

Since the early 1980s, the European Union has financed environment-related research and development, providing policymakers and stakeholders with impact assessments, monitoring tools and research findings. This has helped the EU make strides towards greater sustainability. Reliable research also informs the EU's negotiation of international treaties and provides an authoritative scientific basis for EU policies.

The EU's main instrument for R&D funding is the multi-annual R&D framework programme. It brings together scientists from all 25 EU Member States and is also open to scientists from third countries. The current sixth framework programme (FP6) runs from 2002 to 2006. Its budget of €17.5 billion is divided between seven priority areas, one of which is 'Sustainable Development, Global Change and Ecosystems' with a budget of €2.12 billion.

- €900 million are allocated to 'sustainable energy systems,' covering the development, dissemination and adoption of innovative technologies and sustainable solutions in energy production and consumption. This involves, in particular, renewable energies, energy efficiency, clean burning of fossil fuels, alternative fuels, carbon capture and storage, and hydrogen and fuel cell technology.
- €700 million are allocated to 'global change and ecosystems.' This covers research into reducing greenhouse gas emissions and evaluation of solutions offered by carbon sinks, ozone layer depletion, the water cycle including soil-related aspects, marine and terrestrial biodiversity and genetic resources, the management of the impact of human activities on ecosystems, land management, operational forecasting and modeling (in particular of climate change) and risk assessment and methods for appraising environmental quality.
- €600 million are allocated to 'sustainable surface systems,' covering the development and introduction of environment-friendly, efficient and safe transport systems for passengers and goods by road, rail and sea. This includes novel propulsion systems, in particular fuel cells, advanced design and production techniques and the rebalancing, integration and interoperability of different modes of transport.

In addition, the European Commission's⁽¹⁾ Joint Research Centre is funded under the framework programmes to

(1) The three major institutions of the EU are the European Commission, the Council of Ministers and the European Parliament. The European Commission is the sole body that has the right of initiative in proposing and drafting EU legislation, and it is responsible for ensuring the correct implementation of the legislation after adoption. Most legislation must be adopted by the Council of Ministers, which represents the 25 EU Member States, and the European Parliament, which is made up of 732 directly elected deputies from the 25 Member States.

provide focused research support for EU policymaking, among others on sustainable development.

International cooperation has been an integral part of the framework programmes. Under the 6th framework programme, €600 million are allocated to funding scientists and organisations from third countries so they can participate in EU-supported research projects, and to projects aimed at establishing international cooperation in specific fields.

EU R&D funding complements the financial resources that the 25 EU Member States spend nationally and often acts as a catalyst.

Fact 2: The EU's renewed sustainable development strategy will provide the foundation for future R&D activities aimed at sustainability

The European Union's renewed sustainable development strategy, which is due for adoption in June 2006, will provide the foundation for R&D policies aimed at sustainability in the coming years, making specific proposals:

- to improve the effectiveness of policy. For example, all EU policies must have sustainable development as a core concern, the EU should fully exploit its research potential and there should be close cooperation with all stakeholders to identify obstacles to new technologies in sectors such as environment, energy, transport and communications.
- to tackle six headline objectives:
 - ❖ Climate change and clean energy,
 - ❖ Public health,
 - ❖ Social exclusion, demography and migration,
 - ❖ Management of natural resources (including biodiversity),
 - ❖ Sustainable transport,
 - ❖ Global poverty and development challenges.
- to fully implement the strategy and regularly review progress.

The EU's seventh framework programme (FP7), which will finance EU research from 2007-2013, will make a substantial contribution to implementing the renewed EU sustainable development strategy. In relation to the EU Lisbon Strategy launched in 2000, which sees Europe as a world-leading knowledge-based society, FP7 will concentrate on actions that promote growth and jobs in a manner that is fully consistent with sustainable development.

The FP7 theme on 'Environment' will support work towards enhanced sustainability, but many other research themes will also contribute to the priorities of the sustainable development strategy. For example, EU funding of public health research has allowed major strides to be made on HIV/AIDS, developing new treatments - both therapeutic and preventative - and moving towards a potential AIDS vaccine. This and other work on poverty-related diseases has a direct impact on millions of people in Europe and especially in developing countries.

EU research efforts under the sustainable development strategy contribute in a large part to the goals addressed by the 2006/2007 two-year cycle of the United Nations Commission on Sustainable Development (CSD-14 and CSD-15), which focuses on energy, industrial development, air pollution and climate change.

Fact 3: **EU-funded research activities promote sustainable energy**

Energy is central to achieving sustainable development goals. Today, some two billion people have no access to modern energy services. The challenge lies in finding ways to reconcile this demand for energy with climate change and ensure that sustainable development goals are realised.

Given the global nature of energy challenges and opportunities, international collaboration is now an increasingly important element of energy research. In February 2006, the European Commission and China signed a Memorandum of Understanding on 'Near-zero Emissions Coal Power Generation Technology through Carbon Dioxide Capture and Storage'. This agreement represents a crucial milestone in international co-operation with China, including the issue of energy security and the interactions between energy, research and environmental policies. It will open the door to European and Chinese businesses to invest in low-carbon technologies, both in EU and China, and set the basis for future trade exchanges between the two sides.

In the EU, energy research is bringing solutions to market quickly, addressing not only technical but also organisational, institutional, financial and social issues. Areas of research include clean energy, savings and efficiency, and alternative motor fuels. Longer term research focuses on new and renewable energy sources, including fuel cells, energy from hydrogen, renewable energy, and capture and sequestration of CO₂ from fossil fuel plants.

Significant progress has already been achieved in the renewable energy sector. Since 1981 (FP1) more than €230 million has been allocated to wind energy, which, today, covers 2.8% of Europe's electricity needs. Recent efforts have achieved biomass electricity production costs as low as 0.05 €/kWh, against 0.03 €/kWh for traditional techniques. In the field of solar energy, the cost of installed kW has been reduced by 40% in the last ten to fifteen years. Meanwhile, materials research has increased the efficiency of supercritical coal power plants, reducing CO₂ emissions by 10%.

Fact 4: EU-financed R&D aims to improve industry's sustainability

Industry has a key role to play in achieving the goals of sustainable development, as supplier of goods and services required by society, as a source of job creation and as an active participant in community life. For the EU, sustainable production is a fundamental principle underlying collaborative industrial research and R&D

The Environmental Technologies Action Plan

Focused research and development are a pre-condition for innovation and greater sustainability, but the new technologies, processes and products must also be put to use to deliver the desired results. The EU is therefore pursuing a complementary approach – 'technology push' through R&D and 'market pull' through incentives and the appropriate regulatory framework.

The Environmental Technologies Action Plan launched in 2004 seeks to improve conditions for the development and wider use of eco-technologies. It identifies 25 actions to overcome barriers that slow down the development and introduction of eco-technologies.

The actions focus on three themes:

Getting from research to markets: demonstration projects and dissemination; the establishment of technology platforms bringing together researchers and business on specific issues to build long-term visions on research needs and future market developments; European networks for testing, performance verification and standardisation to provide business and consumers with the information they need.

Improving market conditions: development of performance targets for key products, processes and services to improve their performance and stimulate competition; mobilisation of finance to share the risks of investing in new technologies; review of state aid guidelines and subsidies; green public procurement to use the purchasing power of the public sector as a market driver; awareness-raising among business and consumers; training in the use of new technologies.

Acting globally: promotion of responsible investments and use of environmental technologies in developing countries and countries in economic transition.

ETAP is being implemented by the European Commission, national and regional governments, industry and other stakeholders. Progress includes the establishment of technology platforms on hydrogen & fuel cell technology, photovoltaics, manufacturing technologies, aeronautics, construction and steel and of several networks of validation centres, increased funding for eco-innovation during 2007-2013 and the development of national road maps for ETAP implementation by EU governments.

projects take into account the environmental and social impacts of innovations across a broad range of industries.

EU research on sustainable industrial production and consumption has made a significant contribution to the reduction of greenhouse gas emissions. Future European R&D will address the demand side of the equation, facing the implications of both industrial processes and human activities, and finding new answers to the question of permanently increasing energy and transport needs and the continuing dependency on fossil fuel energy sources.

EU industrial R&D efforts have demonstrated the importance of attention to the larger, longer-term socio-technical context, taking advantage of emerging technologies, rather than focusing on the linear concept of optimised production. The fundamental paradigm shift in a 'knowledge-based society' entails adapting consumption patterns and integrating social dimensions and global co-operation.

Today's R&D strategy is moving Europe towards sustainable products and services that are inherently intelligent, working to exploit the enormous potential of nanosciences and nanotechnologies, and innovative materials and production processes, to deliver higher-added value products and services. This entails €1.5 billion of funding for industrial technologies alone (2002-2006). This figure is expected to rise considerably under FP7 from 2007. This funding will act as a catalyst for EU research at both national and regional levels.

Fact 5: EU R&D also targets air pollution

Protection of the atmosphere is a broad endeavour involving various sectors of economic activity. Research must go hand-in-hand with social and business development to avoid adverse impacts on the economy, taking fully into account the needs of developing countries for the achievement of sustained economic growth and the eradication of poverty.

Many of the tools and technologies for managing, preventing, abating and adapting to air pollution developed under the EU framework programmes can easily be transferred to non EU-countries, particularly developing countries.

Human health is also affected by air quality, particularly exhaust emissions containing NO_x, carbon and heavy metal particulates. The impacts of these emissions are seen predominantly in urban areas. Under FP5 (1998-2002), EU research was initiated to better understand the relationships between air pollution, human exposure and health. With EU backing, specific efforts are now being made to improve the interface between the research community and policy makers, to enable local and regional authorities to take appropriate measures to reduce the negative impact of pollutants on citizens.

For example, specific activities developed under the AIRNET Thematic Network (airnet.iras.uu.nl) are providing a focal point for more than 18 research projects

and national air pollution and health research projects.

In order to increase the dissemination and utility of research findings, stakeholders are being progressively provided with effective and affordable guidelines and tools to better manage air quality and human health issues. Here, the CLEAR initiative (Cluster on Air Quality Research; www.nilu.no/clear) has been a shining example, gathering 11 research projects financed under FP5 and FP6.

People spend about 80% of their daytime hours in buildings. Therefore, EU research also concentrates on the issue of indoor air pollution. The EnVIE Coordination Action (indoorairenvie.cstb.fr) was launched to help to bring together EU, national and other research actions in this field.

Fact 6: Climate change is becoming a major priority of EU-financed R&D

The global dimension of climate change and natural hazards has led to a number of international collaborative research efforts, in which Europe has played and continues to play a key role.

The AMMA initiative (www.amma-eu.org/) is a European research consortium including African partners studying the impact of the West African monsoon on global climate and on social and economic conditions. Meanwhile the ENSEMBLES international consortium (www.ensembles-eu.org) is observing the shrinking Arctic sea ice in order to understand both past and future climate changes. Similar research is looking at changes in atmospheric composition over Australia.

Clean technologies and innovative practices are indispensable elements for combating climate change over both long and medium terms. EU-funded research in this area includes the obvious sectors such as energy and transport but also other fields such as sustainable production and consumption, new materials, nanotechnology, biotechnology, and water and soil treatment, where improvements can lead to resource savings and reduced emissions. Research in these areas has always been an important part of successive framework programmes. Under FP6, an estimated €3 billion, or 17% of the total budget, was invested here.

Further information:

European Commission's R&D web site:

www.europa.eu.int/comm/research/index_en.cfm

Joint Research Centre:

www.jrc.cec.eu.int

Environment Technologies Action Plan:

www.europa.eu.int/comm/environment/etap/index.htm

March 2006