

WORK PROGRAMME 2008

COOPERATION

THEME 6

ENVIRONMENT (INCLUDING CLIMATE CHANGE)

(European Commission C(2007)5765 of 29 November 2007)

The Work Programme presented here provides for two Calls for Proposals and other activities

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THEME 6: ENVIRONMENT (INCLUDING CLIMATE CHANGE)

Objective:

To promote sustainable management of the environment and its resources through advancing our knowledge on the interactions between climate, biosphere, ecosystems and human activities, and developing new technologies, tools and services, in order to address in an integrated way global environmental issues. Emphasis will be put on prediction of climate, ecological, earth and ocean systems changes, on tools and on technologies for monitoring, prevention, mitigation of and adaptation to environmental pressures and risks including on health, as well as for the sustainability of the natural and man-made environment.

I CONTEXT

Policy context

Research under this Theme contributes to the implementation of relevant international commitments¹, protocols², and initiatives³ concluded by the European Union and its Member States. In addition, it will support the research needs arising from existing and emerging EU environmental legislation and policies⁴, and the implementation of the 6th Environmental Action Programme, associated thematic strategies⁵, and the action plans⁶. The renewed Sustainable Development Strategy, approved in June 2006, reaffirms the strong political willingness from the European Union to move into the sustainable path, where environmental protection goes hand in hand with economic prosperity and social cohesion. EU-wide cooperation is necessary because sustainable development is a common objective for countries, regions and cities, and a critical mass and excellence are needed given the scale, scope and high level of complexity of environmental research and its connections to economy and society. Furthermore, wider international cooperation is necessary for the completion of knowledge and the promotion of better management at a global level.

The work programme 2008 will put particular emphasis on the follow-up of the conclusions from the European Council of March 2007, which called on "Member States and EU institutions to pursue actions to develop a sustainable integrated European climate and energy policy", including the promotion of environmental sustainability and combating climate

¹ UN Framework Convention on Climate Change (UNFCCC), UN Convention on Biological Diversity, UN Convention on Combating Desertification, International Strategy for Natural Disaster Reduction

² Kyoto and Montreal protocols

³ World Summit on Sustainable Development, Global Earth Observation System of System initiative (GEOSS)

⁴ Intergovernmental Panel on Climate Change (IPCC), EU Water Initiative, EU Water Framework Directive, European Climate Change Programme II

⁵ Thematic strategies on air pollution, pesticides, soil, waste, urban environment, marine environment and sustainable management of resources. Commission Communication on Halting the Loss of Biodiversity by 2010 (COM(2006)216). Green paper on Towards a Future Maritime Policy for the Union.

⁶ Environment and Health Action Plan (2004-2010) and Environmental Technologies Action Plan (ETAP)

change. Under the heading of strengthened innovation, research and education, it is emphasised that environmental technologies and eco-innovation contribute to achieving the aims of the Lisbon Strategy for Growth and Jobs, including combating climate change. Finally, the deepening of the cooperation in the field of energy and environment in the framework of a New Transatlantic Economic Partnership between the EU and the US is highlighted.

The work programme is structured according to the four main activities of the Environment Theme in the Cooperation Specific Programme: i.e. Climate change, pollution and risks; Sustainable management of resources; Environmental technologies; Earth observation and assessment tools for sustainable development. It takes due account of the dynamics of FP6 running activities to address, right from the outset of FP7, those areas which require urgent action. In line with recent policy development, it also gives emphasis to new or reinforced activities:

1. Climate Change is of growing public concern and it is an important political priority of the European Union. It is one of the main policy priorities of the current Commission. Recently the Commission issued a communication "Limiting Global Climate Change to 2 Degrees Celsius - Policy options for the EU and the world for 2020 and beyond", which highlights the current concerns and the need for community and international action. Research is needed at EU level to understand the causes and consequences, and to predict future evolution of climate change, aerosol levels, ozone depletion and other environmental stress factors. This research is an essential element in the increasing efforts to combat climate change and it is crucial for the implementation of international commitments such as the UN Framework Convention on Climate Change (UNFCCC), the Kyoto and Montreal protocols, and post-2012 Climate change policy initiatives. It also provides the basis for the development of effective adaptation and mitigation strategies and measures to minimise climate change impacts. The Commission is currently preparing a "green-paper" on adaptation: "Living with the effects of inevitable climate change in Europe – Options for community action", which will highlight the need for research. Research results will also contribute to the Intergovernmental Panel on Climate Change (IPCC) and its future assessments of climate change. There are also significant research needs identified in the recent IPCC assessment report (AR4). Furthermore, research needs are arising from other existing and emerging EU level policies, the implementation of the 6th Environmental Action Plan and associated thematic strategies (e.g. air pollution, marine strategy), the European Climate Change Programme-II, the Convention on Long Range transboundary air pollution, Directives such as the Water Framework, the EU Water initiative, as well as from aspects of the agenda of Technology Platforms.

Natural hazards research is an elementary component to guide and support the implementation of the International Strategy for Disaster Reduction and its framework for action (2005-2015), using a multidisciplinary and integrated approach. At European level, research will contribute to related environmental Commission activities, such as the European civil protection programme, and to other European Commission research programmes more related to crisis management for natural disasters. It is therefore necessary to consider a robust and comprehensive framework that enables, for individual hazards and for multi-hazards, the integration of the risk

reduction chain. Such an approach is necessary for any risk management as well as for the development of prevention and mitigation strategies.

The research activities on Environment and Health support the European Environment and Health Action Plan (2004-2010) and are now fully concentrated in the Environment theme. Human health in a changing environment is of growing public and policy concern. The Environment and Health research activity is a direct response to meet these concerns and will become a major driving force to meet the goals of the aforementioned Action Plan. In addition, it will also contribute to a number of other EU policies, which also address environment and health-related issues. These include, among others, possible adverse health outcomes resulting from exposure to industrial chemicals (EU Sustainable Development Strategy, Community strategy on endocrine disrupters), electromagnetic fields (Programme of Community action in the field of public health), noise (EU noise policy), ambient and indoor air pollution (Thematic strategy on air pollution, Thematic strategy on urban environment), assessment of health impacts of floods (Directive on assessment and management of flood risks), and climate change under the European Climate Change Programme-II.

2. Environmental Technologies: The need for a strong support to research activities aiming at developing new environmental technologies that may help the sustainable solution of environmental problems is more and more considered as a strategic priority. The recent adoption of the Energy package with the definition of new ambitious targets for GHG reduction is just the most relevant example of the interest of policy initiatives towards Environmental Technologies. The recently adopted biennial report on the Environmental Technologies Action Plan has pointed out the strategic importance of acting both on the supply side – through focused research and innovation funding – and on the demand side. On the same line, the Communication of September 2006 "Putting knowledge into practice" has launched – among others - an initiative on Lead Markets, where Eco-technologies are indicated as the most natural candidates for the specific role that regulation may have in shaping their market uptake. Moreover, a major need for innovative environmental technologies – and of "clean" industrial processes in particular – emerges from the process of revision of the Integrated Pollution Prevention and Control Directive. All those initiatives converge towards the "Greening" of the European Commission Industrial Policy, which is today a high-priority political initiative. In this context, it is worth to mention the parallel initiative of the German Presidency, which launched an action for an "Ecological Industrial Policy" as a "New Deal" for economy, environment and employment, aiming at making Europe – in the global division of labour – the "energy-efficiency and environmental engineer" of the world. If all those political drivers show the commitment of policy makers, from the private sector side it is possible to record growing investments in environmental business and a growing interest that is witnessed by the growing activity and industrial participation in Technology Platforms addressing environmental issues.
3. Earth Observation, which has gained recent international importance through the GEOSS initiative (Global Earth Observation System of Systems), intends to make the existing observing/ monitoring systems more convergent at global level as described

in the GEOSS 10-Year Implementation Plan⁷. The nature of environmental research is such that Earth Observation data and activities are needed in most of the topics of the environment Theme, which means that many of the environment topics supported through FP7 could be relevant to the Group on Earth Observation (GEO), Global Monitoring for Environment and Security (GMES) and Infrastructure for Spatial Information in Europe (INSPIRE) initiatives.

4. Research is needed to support sustainable management of natural resources, as referred to in the Thematic Strategies related to the 6th Environmental Action Programme, inter alia soil and marine protection, as well as important directives, including the Water Framework Directive. The work programme supports the recent Communication on Halting the Loss of Biodiversity by 2010 – and beyond: sustaining ecosystem services for human well-being, and its associated Action Plan to 2010 and beyond. The Communication highlights 'The Knowledge Base' as one of the 4 key policy areas for action in order to meet high level EU commitments to halt the loss of biodiversity and secure the recovery of natural systems and habitats. Research priorities are also taking into account international commitments and the role of the European Union in the area of desertification. The Commission will pay particular attention to ensure coherence among these biodiversity and ecosystems-related topics across the work programme.
Marine Sciences and Technologies, which are needed to support the ambitions set out in the Green Paper, "Towards a future Maritime Policy for the Union: A European vision for the oceans and seas". Marine scientific research, technology and innovation supports one of the Commission's primary strategic objectives for 2005-2009, "*the particular need for an all-embracing maritime policy aimed at developing a thriving maritime economy, in an environmentally sustainable manner.*"
5. Assessment Tools for Sustainable Development: the focus will be on developing innovative approaches which will inform the policy-making process for sustainable development. The activities will explore the systematic links between environment, economy and society in a global perspective, support the engagement of civil society organisations in research on indicators for sustainable development, and explore new ways to improve connections between research and policy-making in sustainable development.

Approach

The current work programme builds both on the efforts undertaken in the previous EU Research Framework Programmes, especially the 6th Framework Programme, and on the new momentum created by an updated and upgraded theme on Environment within FP7.

The work programme is the result of a consultation process with the FP7 Advisory Group and research stakeholders, informal exchanges and spontaneous submissions by Member States, and ad hoc meetings with relevant Technology Platforms and Commission services. Earth

⁷ See the GEOSS 10-Year Implementation Plan at <http://www.earthobservations.org/docs/10-Year%20Implementation%20Plan.pdf>

Observation aspects of the work programme contribute to the GEO (Group on Earth Observation) international initiative activities.

The work programme describes the research topics in which project proposals can be submitted in response to the calls for proposals. The description of each topic, in addition to the technical content and scope, includes information about the funding scheme(s), any participation requirements (if relevant) and the expected impact.

The pursuit of scientific knowledge and its technical application towards society requires the talent, perspectives and insight that can only be assured by increasing diversity in the research workforce. Therefore, a balanced representation of women and men at all levels in research projects is encouraged. Many of the activities to be funded under this programme will also make positive contributions to education and training and to raising general levels of awareness of the nature of the environmental research undertaken and the benefits likely to accrue.

Funding schemes

The work programme will be implemented through a range of funding schemes as specified in each topic description. The following funding thresholds will apply to different types of projects:

- Collaborative projects in this work programme have been divided into a) small or medium-scale focused research projects, and b) large-scale integrating projects:
 - For small or medium-scale focused research projects, the requested Community contribution shall not exceed EUR 3 500 000, unless otherwise indicated in the topic description. For small or medium-scale focused research projects under the sub-activity 6.4.2 *'Forecasting methods and assessment tools for sustainable development taking into account differing scales of observation'* the requested Community contribution shall not exceed EUR 1 500 000. For small or medium-scale focused research projects as part of the joint call FP7-ENV-NMP-2008-2 under the topic "3.1.1.2. *Nanotechnologies for water treatment*", the requested Community contribution shall not exceed EUR 2 500 000.
 - For large-scale integrating projects the requested Community contribution shall be from EUR 4 000 000 up to EUR 7 000 000, unless otherwise specified in the topic description.
 - For Emerging Needs (comparable to FP6 NEST-type) projects, the requested Community contribution shall not exceed EUR 1 000 000.
- CSA, the "coordination and support actions" funding scheme, allows for 2 different types of actions to be financed: a) coordinating type or b) supporting type. The requested Community contribution for these coordination or support actions is expected to be relatively limited in size and scope, as reflected in the relevant topic descriptions. The requested Community contribution shall not exceed EUR 1 000 000.
- For "Research for the benefit of specific groups"⁸ the requested Community contribution shall not exceed EUR 1 500 000. This funding scheme will be dedicated to develop

⁸ Topic ENV.2008.4.2.2.1 in this Work Programme

scientific knowledge related to activities of civil society organisations (CSO) in order to contribute to public debate. Hence, the funding scheme supports research projects where the bulk of the research is carried out by RTD performers for the benefit of CSOs. *Civil society organisations* are considered to be any legal entity that is non-governmental, not-for-profit, not representing commercial interests, and pursuing a common purpose in the public interest. Professional associations and consultancy organisations are not considered as specific groups under this scheme. *RTD performers* are legal entities able to carry out research on the fields requested by CSOs. Examples of RTD performers are universities, research organisations and industrial companies, including research performing SMEs.

It is important to note that the above mentioned funding thresholds will be applied as eligibility criteria and that the proposals not fulfilling these thresholds are considered as ineligible.

All proposals, including collaborative projects (large-scale integrating projects), will be evaluated under the one-step procedure in the Calls for proposals related to this work programme. In the case of large-scale integrating collaborative projects maximum one project will be retained per topic. In the case of small and medium-scale focused collaborative projects maximum two projects will be retained per topic, except for sub-activity 6.4.2, except for topic ENV.2008.1.1.6.2 under the sub-activity 6.1.1., and except for topic ENV.2008.3.1.1.2. under the sub-activity 6.3.1, on which this limitation will not apply.

Overall in the Theme and in the selection of topics for the Work Programme 2008 specific emphasis has been given to horizontal issues such as policy relevant research and emerging needs, international co-operation, cross-thematic approaches, dissemination actions, and SME targeted topics.

- **Policy relevant research and emerging needs**

The policy relevant research and emerging needs are considered fundamental elements for the environmental research Theme and they are referred to in all activities. Therefore, the approach addresses the significant research needs arising from existing EU-level policies, such as the implementation of the 6th Environmental Action Plan and associated thematic strategies, programmes and directives, as well as research needs arising from the implementation of international commitments at the EU-level.

The "policy relevant" topics are:

ENV.1.1.3.1. Impacts of climate variability, extreme events and increasing atmospheric greenhouse gas concentrations on terrestrial carbon storage, exchange flows and soil carbon dynamics

ENV.2008.1.1.5.1 Addressing deforestation in tropical areas: Greenhouse gas emissions, socio-economic drivers and impacts, and policy options for emissions reduction

ENV.2008.1.1.6.1 Impacts of Himalayan glaciers retreat and monsoon pattern change on the water resources in Northern India, and adaptation strategies

ENV.2008.1.1.6.3. Multiple pathways analysis of emerging economies in a post-Kyoto regime

ENV.2008.1.2.1.1. Health impacts of exposure to radiofrequency fields in childhood and adolescence

ENV.2008.1.3.1.1 Development of a common methodology and tools to evaluate earthquake hazard in Europe

ENV.2008.1.3.3.1 Prediction of triggering and risk assessment for landslides

ENV.2008.2.1.2.1 Groundwater systems

ENV.2008.2.1.2.3. Assessing the ecological status of water bodies

ENV.2008.2.1.3.1 Assessment of methods to combat desertification

ENV.2008.2.1.4.1 Improving the capacity to protect and manage the biodiversity of continental waters

ENV.2008.2.1.4.3 Increasing the integration of biodiversity research results into policy making

ENV.2008.2.2.1.1 Monitoring and evaluation of Spatially Managed Areas (SMA)

ENV.2008.2.2.1.3 Ecosystem approach to marine environment and resources

ENV.2008.3.1.1.1. Rehabilitation technologies for degraded water systems presenting quantity and quality problems

ENV.2008.3.1.2.1. Recovery of degraded soil resources

ENV.2008.3.1.3.1. Waste prevention: Industrial networking and zero-waste entrepreneurship

ENV.2008.3.1.4.1. Substitution options for Brominated Flame Retardants (BFRs): a prototypical case for source control of Priority Pollutants in a Life Cycle Thinking perspective

ENV.2008.3.3.3.1. Harmonised approaches towards the development of international technology verification systems

ENV.2008.4.1.1.1 European Environment Earth Observation system supporting INSPIRE and compatible with the GEOSS (Global Earth Observation System of Systems)

ENV.2008.4.2.2.1. Engaging civil society in research on Sustainable Development indicators

ENV.2008.4.2.3.2. Enhancing connectivity between research and policy-making in sustainable development

The "emerging need" topics are:

ENV.2008.1.1.6.2. Implications and risks of novel options to limit climate change

- **International Co-operation Partner Countries (ICPC) activities**

Particular emphasis has been made to identify specific international co-operation actions covering all the activities of the Theme. It is important to note that the approach taken includes two mechanisms: firstly, opening all the topics of the call for international co-operation and encouraging the ICPC⁹ participation in various topics across the Theme, and secondly, through Specific International Co-operation Actions (SICA) across all activities

⁹ The list of eligible International Co-operation Partner Countries is attached as Annex 1

of the work programme, of which the contents were identified in particular through international workshops.

The Specific International Co-operation Actions (SICA) included in this work programme are:

ENV.2008.1.1.5.1 Addressing deforestation in tropical areas: Greenhouse gas emissions, socio-economic drivers and impacts, and policy options for emissions reduction

ENV.2008.1.1.6.1 Impacts of Himalayan glaciers retreat and monsoon pattern change on the water resources in Northern India, and adaptation strategies

ENV.2008.4.1.4.1. Developing necessary research activities for capacity building relevant to Earth Observation and GEO in the Black Sea basin

All topics in this work programme are open to international cooperation. In addition to the SICA topics identified above, several other topics have been specifically highlighted as being research areas which are particularly well suited for international cooperation.

For these topics, the inclusion of (a) relevant international partner(s) could add to the scientific and/ or technological excellence of the project and/ or lead to an increased impact of the research to be undertaken. These aspects will be considered specifically during the evaluation of the following topics concerned.

ENV.2008.1.1.1.1 Sea-Level Rise: Trends in contributions from continental ice, processes and links to climate change

ENV.2008.1.1.6.3 Multiple pathway analysis of emerging economies in a post-Kyoto regime engaging the emerging economies for climate protection

ENV.2008.1.2.1.1 Health impacts of exposure to radiofrequency fields in childhood and adolescence

ENV.2008.1.2.1.2. Comparison of health risks in populations in the Arctic and selected areas in Europe due to the spreading of contaminants resulting from climate change

ENV.2008.1.2.1.4 New, improved and validated biomarkers to investigate long-term health impacts of exposure to environmental pollutants

ENV.2008.1.3.1.1. Development of a common methodology and tools to evaluate earthquake hazard in Europe

ENV.2008.1.3.3.1 Prediction of triggering and risk assessment for landslides

ENV.2008.2.1.2.2 Clustering River Basins Twinning Initiatives and knowledge transfer

ENV.2008.2.1.3.1 Assessment of methods to combat desertification

ENV.2008.3.2.1.1 Development and application of methodologies, technologies, models and tools for damage assessment, monitoring and adaptation to climate change impacts (excluding extreme events)

ENV.2008.3.3.3.1 Harmonised approaches towards the development of international technology verification systems

ENV.2008.5.1.0.2 Research excellence and major infrastructure in Russia and potential for S&T co-operation with EU partners in the area of the environment

- **Cross-thematic approaches**

There is a close coordination and shared information between all Themes of the Cooperation Specific Programme, in particular regarding their contribution to sustainability, environmental technologies, and linkages between climate change and energy. The following topic is implemented through a joint call between Theme 6. Environment (including Climate Change) and Theme 4. Nanosciences, Nanotechnologies, Materials and New Production Technologies (call identifier FP7-ENV-NMP-2008-2):

ENV.2008.3.1.1.2 Nanotechnologies for water treatment

- **Dissemination actions**

Special attention will be given to communicating and disseminating research results and outcomes to a wider public, including policy and regulatory authorities. This approach will focus on the establishment of a dialogue between both "research to policy" aspects and "science-society" actors. The dissemination actions are to be implemented through the integration of dissemination and knowledge transfer actions within projects, and through specific dissemination actions. The following topics are oriented towards dissemination:

ENV.2008.2.1.4.2 Rehabilitation of data from biodiversity related projects funded under previous framework programmes

ENV.2008.5.1.0.1 Development of a methodology to exploit the results and enhance impacts of EU environment research activities

- **SME relevant research**

The Theme is designed to attract industrial participants, putting specific emphasis on SME relevant research topics namely within the areas of the Environmental Technologies activity. In this activity SME-targeted collaborative research topics have been introduced in areas which are supporting the Strategic Research agendas of the relevant Technology Platforms¹⁰ and which are specifically designed to encourage SME participation in research and innovation. In order to ensure industrial relevance and impact of the research effort, the active participation of industrial partners represents an added value to the activities and this will be reflected in the evaluation. This approach includes the following topics:

ENV.2008.3.1.1.2 Nanotechnologies for water treatment

ENV.2008.3.1.2.1. Recovery of degraded soil resources

ENV.2008.3.1.3.1 Waste prevention: industrial networking and zero-waste entrepreneurship

ENV.2008.3.1.3.2 Technologies for high added value production from waste

ENV.2008.3.1.4.1 Substitution option for Brominated Flame Retardants (BFRs): a prototypical case for source control of Priority Pollutants in a Life Cycle Thinking perspective

¹⁰ Technology Platform on Sustainable Chemistry, Technology Platform on Forestry, Technology Platform on Water Supply and Sanitation, Technology Platform on Construction

ENV.2008.3.1.5.1. Innovative environmental technologies including design concepts and materials for the reduction of damage to the environment

ENV.2008.3.1.6.1 Development of automated sensing technologies for estuaries, coastal areas and seas

ENV.2008.3.2.2.1 Framework conditions to enhance most promising prototypes

ENV.2008.3.3.2.1 Sustainability Assessment of Technologies

Other activities

- Monitoring, Evaluation and Impact Assessment

The Theme "Environment" will comply with the prevailing requirements for monitoring, evaluation, and impact assessments, both ex-ante and ex-post. This may involve studies and surveys (as appropriate implemented through public procurement) as well as appointing experts or groups of experts. The overall commitment appropriations for this activity in 2008 will be up to 300 000 EUR, of which maximum 250 000 EUR for public procurement.

The work will include the launch of a mid-term review of environment activities under the 7th Framework Programme and studies of the longer term impact of Community funding of research in certain areas/ disciplines/ sectors, including from previous Framework Programmes. This review will be subject to one contract following a public procurement procedure, to the extent possible by using an Framework contract already existing in the Commission for evaluation studies. The call for tender is scheduled for third quarter 2008 in view of contract signature in the fourth quarter of 2009.

The work will also include an ex-ante impact assessment of the planned BONUS Article 169 initiative.

- Communication and Information Activities

Dissemination of specific project results is meant to be an integral part within each project. In addition, specific dissemination activities are also envisaged:

- supporting actions implemented via calls for proposals included in the call of 2008, or through public procurement (mainly framework contracts of DG RTD, SCIC and OPOCE) with commitment appropriations amounting in the 2008 call to EUR 500 000. Activities include: promotion of synergies, clusters of results within a given area (conferences, video/ broadcasting, publications, prizes and awards, exhibitions and generic brokerage events, etc.)
- publication on CORDIS: information to applicants, information on funded projects, presentation of project results, etc.

- An annual contribution to the 2008 activities of the GEO Secretariat¹¹

¹¹ Contribution paid by the Communities as subscription to a body of which they are a member, according to Article 108(2)(d) of the Financial Regulation applicable to the general budget of the European Communities

To ensure the implementation of the GEOSS according to its annual work plan and the continuity of the participation of Europe in GEO, the Commission will pay on behalf of the Community which is member of the Group, a yearly contribution of EUR 600 000 to GEO Secretariat (hosted by World Meteorological Organisation in Geneva, Switzerland).

- Support to the conference "Bridging the Gap – To the Future" 14-16 May 2008 in Slovenia

The conference will address the gaps between the information available and the information needs for various environmental policy decisions. The main objectives are to facilitate the dialogue between researchers, economic stakeholders, NGOs and policy-makers, to evaluate achievements of the previous three conferences, and to identify incentives for change in the future. Key themes include greening of the economy, climate change energy strategies, and information for sustainability. The conference will be organised by the Slovenian Environmental Agency (based in Ljubljana, Slovenia). The Community contribution of up to EUR 200 000 will be implemented as a grant to a named beneficiary. The standard FP7 evaluation criteria (including thresholds) and sub-criteria for Coordination and Support Actions as set out in Annex 2 to this work programme shall apply. Furthermore, the standard FP7 funding rates and conditions for Coordination and Support Actions shall apply.

- External expertise
 - The use of appointed external experts for the evaluation of project proposals and, where appropriate, for the reviewing of running projects.
 - The set up of groups of external experts to advise on or support the design and implementation of Community research policy.

II CONTENT OF CALLS IN 2008

Activity 6.1. CLIMATE CHANGE, POLLUTION, AND RISKS

The proposed topics for the second call of FP7 have been selected following important research results, policy needs, and specific events that have identified essential research needs.

In particular, research priorities identified by the recent Intergovernmental Panel on Climate Change (IPCC) 4th Assessment Report, the WMO/UNEP 2006 Ozone Assessment Report, the recent Commission Communication on limiting Global Climate Change to 2 degrees Celsius, and the draft Commission Green Paper on Adaptation to Climate Change have been key drivers of the 2008 work programme. Consideration has also been given to support research needs related to the International Polar Year (IPY) and the first commitment period of the Kyoto Protocol (2008-2012). Furthermore, attention has also been given to conclusions and recommendations from several key symposiums such as '1st Strategic EU – India S&T' and the 'EU-Japan' workshops on climate change research needs, the 'Climate Change and the European Water Dimension' symposium organised by German under the German Presidency and workshops organised by DG RTD (e.g. on 'climate change impact on water cycle', 'research challenges on climate change', or 'polar environment and climate').

For environment and health, the topics proposed are in line with the priorities of the European Environment and Health Action Plan and to the research priorities identified by, among others, the Commission's Scientific Committee on Emerging and Newly Identified Health Risks of policy DGs and the WHO research agenda. New policies taken into account in the drafting of the topics are the Global Plan of Action on Workers' Health 2008-2017, and the EU Strategy on Health and Safety at Work 2007-2012, which identify noise, EMF and toxic chemicals as priority issues. Furthermore, attention has been given to conclusions and recommendations from the open stakeholder consultation organised by DG RTD.

For natural hazards, the UN ISDR Hyogo framework for disaster reduction has been taken into account. The needs of Eurocode 8, the Soil Thematic Strategy, and of the European Construction Technology platform have been considered as well as research needs and indications raised from specific events, such as the 'European Research on Flood Risk Management' workshop organised by DG RTD, and conclusions from specific consultations with experts.

Sub-activity 6.1.1. Pressures on environment and climate

Indicative available budget: EUR 42 million

Rationale for 2008 work programme

Research priorities identified for the 2008 Work Programme are based, inter alia, on the conclusions and recommendations of the IPCC 4th Assessment Report, the WMO/UNEP 2006 Ozone Assessment Report and international research symposia hosted by the European Commission. The aims are to better understand the causes, mechanisms and consequences of climate change and ozone depletion, to assess how the associated impacts will affect society

and to develop response options. The IPCC report is pointing to a potential risk that sea-level rise will accelerate if global surface warming trends continue as projected. In parallel the 2006 Ozone Assessment Report indicates that the warming trends could also cause further delays of the recovery of stratospheric ozone layer. In addition, terrestrial carbon stocks may become more vulnerable also related to the expected increase of extreme events, adding to the climate problem. According to the IPCC, there is a need to improve the earth system models to reduce the uncertainties in the scenario calculations and to better understand the feedbacks related to climate change.

Tropical deforestation is a significant source of greenhouse gas emissions but estimates are uncertain and the socio-economic driving factors behind are not well known. There is an urgent need to better quantify these emissions and to develop policy response options to halt tropical deforestation. Climate change impact on marine ecosystems will be most dramatic in the polar region (e.g. changing sea-ice cover) and needs to be studied with priority. Climate change will also affect the regional water resources. This call focuses on the region of Northern India (one of the priorities in international co-operation) where melting of Himalayan glaciers and changes in the patterns of Asian monsoon will have large impacts on the future availability of water which needs to be assessed.

Moreover, the risks from proactive new options to limit climate change need to be studied. Finally, research conducted should help to implement international conventions and provide support to international and European environmental policies.

Area 6.1.1.1. The Earth System and Climate: Functioning and abrupt changes

ENV.2008.1.1.1.1. Sea-Level Rise: Trends in contributions from continental ice, processes and links to climate change

Recent studies have stressed the importance of continental ice melting in the sea-level rise observed in the past decades and the need to have better predictions of its contribution for the future. Observations indicate that the melting of the ice is accelerating for glaciers worldwide and for Arctic ice sheets. Antarctic ice sheets indicate large regional differences in snow precipitation and temperature trends while there is clear ice retreat in the Antarctic Peninsula. Under this topic research should include field studies of key processes (e.g. ice flow dynamics), observations, data gathering and analysis, and modelling to refine predictions of the behaviour of glaciers (globally), ice caps, and ice sheets, links to climate change and associated changes of sea level over the next decades and centuries. The project should take advantage through collaboration from on-going European research programmes in the Arctic and Antarctic and make specific efforts to fill gaps in data coverage (e.g. Antarctica and glaciers worldwide). International cooperation is encouraged.

Funding scheme: collaborative project (large-scale integrating project, community contribution from EUR 4 000 000 up to 10 000 000)

Expected impact: *Quantification of the risk of substantial acceleration of sea level rise due to continental ice melting. The project will reduce uncertainties in these important processes in sea level changes and contribute to the Fifth IPCC Assessment.*

Area 6.1.1.2. Emissions and Pressures: Natural and anthropogenic

ENV.2008.1.1.2.1. Climate-chemistry interactions in the stratosphere related to ozone depletion

Anthropogenic emissions of chemical species have altered the atmospheric composition with long lasting impacts and consequences such as changing air quality, the forcing of climate change and stratospheric ozone depletion. Climate change in turn is affecting atmospheric chemistry with many unknown feed-back mechanisms and may further delay ozone recovery. Changes in stratospheric composition need to be detected. Research should help to better understand stratospheric dynamics, trends and processes of stratospheric composition changes, the role of climate-chemistry interactions, including the dynamical response of the stratosphere to the chemical composition changes, and its impact on stratospheric ozone depletion. Feed-back mechanisms between climate change and stratospheric processes need to be better understood in order to predict the future evolution of ozone abundance. Standard climate change scenarios should be applied to assess the impact on the future evolution of stratospheric composition and its impacts on the climate.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

Expected impact: *The project will reduce the uncertainties in the evolution over the next decades of the stratosphere and improve estimates of time scales of ozone layer recovery in response to the implementation of the Montreal Protocol. The project will also provide information on the interactions of changes in the stratosphere and climate.*

Area 6.1.1.3. The Global Carbon cycle - Greenhouse Gas budgets

ENV.1.1.3.1. Impacts of climate variability, extreme events and increasing atmospheric greenhouse gas concentrations on terrestrial carbon storage, exchange flows and soil carbon dynamics

The aim is to better quantify the impacts of climate variability and extreme events on the carbon storage, exchange flows, and perturbations of soil functioning (including loss of organic matter) in European ecosystems (including agricultural land and forests) at the regional and continental scale. The impacts of changes in dissolved organic carbon quality and soil-water cycle interactions shall also be studied. Research should also address the effect of projected changes in climate and increasing atmospheric greenhouse gas concentrations on the key processes controlling the carbon cycle, and assess the vulnerability and future evolution of terrestrial sinks at European and global scale. Studies should draw on better integration of related biophysical processes, atmospheric and ecosystem observations, and state-of-the-art models. **(Policy relevant topic)**

Funding scheme: collaborative projects (small or medium-scale research projects)

Expected impact: *More accurate quantification of the impacts of climate variability, extreme events and increasing atmospheric greenhouse gas (GHG) concentrations on carbon storage, exchange and soil organic matter in European terrestrial ecosystems. Improve our predictive capacity of the future evolution and vulnerability of carbon.*

Provide input to post-2012 initiatives and policies, as well as provide support and advice for soil use strategies (e.g. in relation to the EU Soil Protection Strategy).

Area 6.1.1.4. Future Climate

ENV.2008.1.1.4.1. New components in Earth System modelling for better climate projections

Future climate predictions necessitate development of models which incorporate more complete range of Earth System parameters in comparison to the existing ones, as well as the Earth System feedbacks on future climate change. Incorporation of Earth system components (e.g., chemistry, stratosphere, nitrogen cycle, aerosols and ozone, cryosphere, ocean biochemistry and carbon sink, human dimension) within climate models and applications of these to a number of case studies (e.g. decadal-timescale prediction). Implications of these feedbacks for impacts of climate change on different sectors (e.g. water resources, agriculture, forestry, air quality) through specific simulations.

Funding scheme: collaborative project (large-scale integrating project, community contribution from EUR 4 000 000 up to 8 000 000)

Expected impact: *The project outcome should contribute to the 5th IPCC assessment on climate change and provide solid scientific basis for future policy actions at European and international level (e.g. Kyoto Protocol and post-2012 climate negotiations). Through the incorporation of new components in the Earth System models and the parameterisation of the effects of Earth System feedbacks, it is expected reduced uncertainty in future climate change projections at decadal and centennial time scales.*

Area 6.1.1.5. Climate Change Natural and Socio-economic Impacts

ENV.2008.1.1.5.1. Addressing deforestation in tropical areas: Greenhouse gas emissions, socio-economic drivers and impacts, and policy options for emissions reduction

Greenhouse gas emissions from deforestation in tropical areas need to be better quantified and the socio-economic drivers need to be analysed. The impacts from deforestation should be studied. These will contribute to the development of policy options to reduce GHG emissions from deforestation under present and future climate change scenarios considering the environmental, social and economical pressures in tropical areas. Work should provide input to emission reduction estimates for 2020 and thereafter, as well as to policy approaches, currently discussed in UNFCCC. Climate policies targeted at avoiding deforestation should be assessed and socio-economic impacts quantified. The impact of international climate policies on changes in the use of land (i.e. food versus bio fuels) should be assessed. **(Specific International Co-operation Action) (Policy relevant topic).**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

Expected impact: *The project is expected to provide better quantification of GHG emissions from deforestation and in depth evaluation of related environmental and socio-economic impacts and drivers. Such knowledge will reduce uncertainties in emission reduction estimates for 2020 and beyond, and provide support to European and international policy approaches and post-2012 discussions on land use and deforestation under the UNFCCC.*

ENV.2008.1.1.5.2. Climate change impacts and Thresholds on Arctic Ocean ecosystems

The research aims to investigate the impacts of climate change on Arctic Ocean ecosystems, based on field studies, observations and models. The research should identify the elements of ecosystem which are the most sensitive to climate change and will develop trajectories of climate change impacts under different climate change scenarios and assess if the Arctic marine ecosystems are close to critical thresholds ("tipping points"). The possible climate-induced changes of the links between Arctic Ocean ecosystems and the north-east Atlantic shall also be studied. The research will also characterise/quantify the resilience of these ecosystems. The project will study the socio-economic impact of these changes in terms of opportunities and risks.

Funding scheme: collaborative project (large-scale integrating project, community contribution from EUR 4 000 000 up to 5 000 000)

Expected impact: *Research will define the elements of vulnerability and the adaptive capacity of Arctic and north-east Atlantic ecosystems. The project will deliver results on the proximity of Arctic Ocean ecosystems to critical thresholds.*

Area 6.1.1.6. Response strategies: Adaptation, Mitigation and Policies

ENV.2008.1.1.6.1. Impacts of Himalayan glaciers retreat and monsoon pattern change on the water resources in Northern India, and adaptation strategies

The aim is to assess the impact of Himalayan glaciers retreat and possible changes of the Indian summer monsoon on the spatial and temporal distribution of water resources in Northern India and to provide recommendations for appropriate response strategies. The project should study the changes under various climate change scenarios and analyse consequential impacts on water resources by integrating available climate- and hydrological data, and state-of-the art regional models. Interactions between the Indian summer monsoon and the retreat of Himalayan glaciers should be explored, particularly in relation to water resources availability at different time scales. Research should address likely consequences on important sectors (e.g. public water supply, agriculture, hydropower, human health) under different climate change scenarios, and provide suggestions for effective adaptation measures. **(Specific International Co-operation Action) (Policy relevant topic)**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

Expected impact: *Present and future water resources availability in Northern India is dependent upon spatial/temporal changes of the Himalayan glaciers retreat as well as changes to the Indian summer monsoon. The project will assess in detail the impacts*

of these changes to water resources in Northern India under different climate change scenarios and quantify the consequences to related sectors (e.g. public water supply, agriculture, health, and energy). Furthermore, and based on the analysis mentioned above, it will provide recommendations for efficient adaptation and other response strategies.

ENV.2008.1.1.6.2. Implications and risks of novel options to limit climate change

The aim is to study the implications and risks associated to novel options to limit climate change. These could include environmental management/modification and associated technical elements, socio-economic strategies, geo-engineering. The project should investigate the effects of these options on the environment (including atmosphere –both troposphere and stratosphere-, ocean and land), their effectiveness, costs, risks and probable associated ethical concerns. Proposals must give reasonable first estimates of expected mitigation potential. Proposals could examine different options.

Funding scheme: collaborative projects (small or medium-scale focused research projects), Emerging Needs (Community contribution up to EUR 1 000 000 per project)

Expected impact: *Assessment of the feasibility of alternative effective climate change mitigation options. Provide the scientific basis for proper policy and industry discussion at short to medium time scales. Such investigations must be set in context with assessments such as on climate change by IPCC, air quality under implementation of the Thematic Strategy on Air Pollution and CLRTAP, and stratospheric ozone by UNEP/WMO.*

ENV.2008.1.1.6.3. Multiple pathways analysis of emerging economies in a post-Kyoto regime

An analysis of how the emerging economies can be engaged in a portfolio of climate protection policies with regard to post-2012 regime building. This work should take into account the geographic specifications and socio-economic conditions of different countries, as well as institutional platforms for cooperation between the emerging economies and industrialised countries. **(Policy relevant topic)**

Funding scheme: coordination and support actions (supporting type)

Expected impact: *Provide a portfolio of policy options for emerging economies to engage in climate change protection measures under a post-2012 regime.*

Sub-activity 6.1.2. Environment and Health

Indicative available budget: EUR 20 million

Rationale for 2008 work programme

The topics proposed for the second call will support multi-disciplinary research to improve the understanding of the link between environmental stressors and health, needed for improved policy making and to integrate public health concerns and disease characterisation related to emerging environmental risks. The topics proposed will focus on stressors of high priority (noise, EMF, climate change) and health impacts of relevance, especially those occurring some time after exposure, being therefore more difficult to discern.

The proposed research topics are based on research needs identified during recent workshops (noise, biomarkers etc), by the Commission's Scientific Committee on Emerging and Newly Identified Health Risks, in the WHO Research Agenda, or in the Earth Systems Science Partnership (ESSP) report on Global Environmental Change and Human Health, among others. They will contribute to the goals of a number of EU policies, including those of the Environment and Health Action Plan (2004-2010) and its recent mid-term review. The research to be undertaken will address important policy-relevant issues such as possible adverse health outcomes resulting from exposure to chemicals (in support of EU sustainable development policies), electromagnetic fields (in support of the Programme of Community Action in the Field of Public Health), noise (in support of the EU noise policy), and climate change (supporting the European Climate Change Programme-II). Consideration has also been given to support environment and health research needs related to the International Polar Year such as the impact of climate change on Arctic populations.

Area 6.1.2.1. Health effects of exposure to environmental stressors

ENV.2008.1.2.1.1. Health impacts of exposure to radiofrequency fields in childhood and adolescence

The aim is to investigate whether prolonged exposure to radiofrequency fields (RF EMF) and pulsed low frequency magnetic fields via mobile phone use increases the risk of potential adverse effects in the central nervous system (e.g. brain cancer) in childhood and adolescence. The project should also address the need for improved exposure assessment in these populations. International collaboration is encouraged. **(Policy relevant topic)**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

Expected impact: *The project will improve risk assessment of potential adverse health effects of exposure to EMF in children to support developing Community public health measures and policies.*

ENV.2008.1.2.1.2. Comparison of health risks in populations in the Arctic and selected areas in Europe due to the spreading of contaminants resulting from climate change

The aim will be to explore the changing routes and mechanisms by which air pollutants and chemical persistent pollutants, are delivered to, interact with, and spread in the Arctic and the possible role of climate variability and global climate change in this process. Studies should include the estimation of direct and indirect health effects on Arctic populations and relevant comparisons with exposed local populations in the EU. International collaboration is encouraged.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact:** Research shows that especially Arctic regions and populations are vulnerable to long-term range pollution coming from other areas of the globe. The project will establish geographical and temporal trends in distribution of pollutants and health impacts in the Arctic and selected areas in Europe due to global change, in support of relevant EU policies related to health impacts of global change, including adaptation policies.*

ENV.2008.1.2.1.3. European research network on noise and health

The aim of this network will be to bring together research organisations working on noise and related health effects from across Europe in order to gain a critical mass of resources, allowing the development of new strategies for noise research. The network should exchange information on recent developments on noise research, including novel methods of exposure assessment and development of innovative methods of measurement of moderating factors and outcomes. Risks for health affecting e.g. the cardiovascular system, sleep, neurocognitive and immune functions should be considered, as well as impact of co-stressors (e.g. air pollution), settings (e.g. transport), and novel types of exposure. Links will be established with other networks whose main focus is primarily on transport-related stressors. Data emanating from previous and ongoing studies should be taken advantage of, analysed for policy purposes, and made available.

Funding scheme: coordination and support actions (coordinating type)

***Expected impact:** New insights into the effects and mechanisms of the contribution of noise and confounding factors to human health. Prioritisation and standardisation of the state of the art methods for measurement of exposures and outcomes across Europe and broadening the scope of noise research to include other environmental stressors in order to contribute to further development of EU noise policy, e.g., in the framework of the EU Environmental Noise Directive and further development of EU air policy.*

ENV.2008.1.2.1.4. New, improved and validated biomarkers to investigate long-term health impacts of exposure to environmental pollutants

The aim will be to take advantage of advances in emerging technologies such as 'omics' to identify and validate biomarkers of exposure via different exposure routes, disease susceptibility and effect, including biomarkers for disease progression and long latency effects. Focus should be on exposure to (emerging) contaminants such as neurotoxic,

carcinogenic, endocrine-disrupting, immunotoxic or allergenic substances including mixtures. The project can contain epidemiological and toxicological studies including the use of in vitro and in vivo (ecotoxicological) models. International collaboration will be encouraged.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

Expected impact: Risk assessment procedures undertaken by regulatory authorities in the EU require precise knowledge of the state of population exposures and possible related health effects. This project will identify and validate biomarkers to predict environmental health/disease outcomes due to exposure to environmental contaminants that can be used in regulatory settings such as assessment of cancer risk, risk of allergy development and in biomonitoring.

ENV.2008.1.2.1.5. Quantification of changing surface UV radiation levels and its impact on human health

The overall aim is to better characterise changing UV exposure in relation to important leisure (skiing, beach) and working activities in Europe and to assess its impact on human health (e.g. immune response) including risk/ benefit estimations. Furthermore, improved measurement techniques and radiative transfer models should be developed to better represent radiation in climate models and for prediction of future UV levels. Spectral radiance distribution at ground level under changing climate and atmospheric composition condition should be quantified, taking into account e.g. the role and interference of clouds and atmospheric pollution at ground level.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

Expected impact: Quantification of UV exposure taking into account high surface albedo effects under both clear skies and cloudy conditions and related human health risks. Definition of critical exposure levels/doses for various health outcomes ranging from eye diseases to the impact on the immune system. Improved assessment of health risks associated with changing UV exposure to support relevant EU policies related to health impacts of global change.

ENV.2008.1.2.1.6. Databases based on European cohort studies and their exploitation for advancement of knowledge of environment-health relationships

The aim is to advance our knowledge on specific environment and health causal relationships by providing support to exploitation of the wealth of data generated by past or ongoing studies funded by the EC and national programmes. The grant can support activities such as inventories of cohorts, options for sample storage and analysis, database building, and assurance of quality and interoperability, data access, analysis and validation, recommendations for data collection in the future to improve environment-health linkages, and dissemination.

Funding scheme: coordination and support actions (coordinating type)

Expected impact: The structuring and consolidation of often fragmented data from various studies undertaken throughout Europe will improve the knowledge base for

environment and health linkages. Data regarding environment-health causal relationships will be more readily available in a form useful for policy makers.

Area 6.1.2.2. Integrated approaches for environment and health risk assessment

Not open in 2008.

Area 6.1.2.3. Delivery of methods and decision support tools for risk analysis and policy development

Not open in 2008.

Sub-activity 6.1.3. Natural hazards

Indicative available budget: EUR 14 million

Rationale for the 2008 work programme

EC natural hazards research is an important component to guide and support the implementation of the UN International Strategy for Disaster Reduction and its framework for action (2005-2015), using a multidisciplinary and integrated approach. At European level, research contributes to environment related European Policies. This call wants to give support to research needed for an efficient implementation of the seismic Eurocode that will be put into force in 2010 and to the Soil Thematic Strategy by developing a framework for assessment of landslide risk helping Member States to identify and mitigate risk on the base of a common methodology.. The thematic on flash flood is answering to the concern of the IPCC AR4, highlighting the increased risk of inland flash floods that will require a holistic and sustainable management approach. It will further on contribute to the implementation of the Flood Risk Management Directive. The call will also contribute to bridge the gap between social sciences- and natural hazard communities and improve our vision and understanding on the perception of society to natural hazards and on its capacity building and resilience. Furthermore coordination between European and national level research activities and needs in the field of Natural Hazards will be improved.

Area 6.1.3.1. Hazard assessment, triggering factors and forecasting

ENV.2008.1.3.1.1. Development of a common methodology and tools to evaluate earthquake hazard in Europe

There is a need to create, for Europe, a unified framework for seismic hazard assessment and to produce an integrated European probabilistic seismic hazard assessment (PSHA) model and specific scenario based modelling tools. This should serve as a reference for national zonation as well as seismic safety for the industry sector. The framework should include homogeneous standards, procedures, harmonized inputs and parameters for a regional hazard assessment, including models for seismic sources, activity rates and ground-motion attenuation. The most appropriate return periods and ground-motion parameters for design for built environment for ultimate and damage-limit states should be evaluated. Methods must be developed based on the latest scientific understanding of the earthquake processes and seismic wave propagation. Participation of countries from the southern Mediterranean area is encouraged. **(Policy relevant topic)**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact:** The Eurocode 8 on Design of structures for earthquake resistance will gradually take over for national standards in the period 2007-2010. However, its provisions for seismic safety constructions are based on national seismic hazard zonations. As a result, seismic hazard is assessed in Europe in a variety of uneven and incompatible ways in different countries and different sectors (may differ by more than*

50% at borders). The project will contribute to a homogeneous application of the Eurocode 8 through harmonising methodologies for seismic hazard zonation in Europe. In addition, it should contribute to the emerging OECD Global Science Forum initiative on global earthquake risk mapping and monitoring.

Area 6.1.3.2. Vulnerability assessment and societal impacts

ENV.2008.1.3.2.1. Natural Hazards: Social perception, behaviour and responses to risks

The aim of this action is to contribute to a better assessment of risk perception of societies and communities confronted by natural disasters. The project should identify and assess key studies, initiatives, best practices and existing legal tools in order to elaborate strategies and recommendations for actions to improve capacity building, preparedness and resilience of the society in the context of natural hazards. Gaps in research in these fields need to be assessed. Education on disaster prevention and awareness raising of the society as a means to improve social perception and change behaviour needs to be considered in a multidisciplinary context. The actions described under this topic could be mainly organised by means of small workshops enabling synthetic vision papers, guidelines and recommendations to be elaborated.

Funding scheme: coordination and support actions (coordinating type)

Expected impact: *State-of-the art knowledge and know-how inventory, improving ways for raising awareness, enhanced strategies for social perception and preparedness to natural hazards, guidance for future actions and the role of research.*

Area 6.1.3.3. Risk assessment and management

ENV.2008.1.3.3.1. Prediction of triggering and risk assessment for landslides

Taking into account how climate change and human activity influence slope instability, research should improve our ability to forecast landslide hazards and detect risk zones. There is a need to better quantify the triggering mechanisms, conditions and thresholds, and related uncertainties. Synergies between knowledge in several types of gravity driven mass movement should be looked for. Effort should also focus on the development of a generic quantitative risk assessment frame for a better risk management. The methods and procedures developed in the project should help to choose an appropriate set of mitigation and prevention measure. International cooperation is welcome. **(Policy relevant topic)**

Funding scheme: collaborative project (large-scale integrating project)

Expected impact: *According to the Thematic Strategy for Soil Protection, landslides are one of the main eight threats to which soils in the EU are confronted. proposal for a Soil Framework Directive requires Member States to identify areas at risk to landslides on the basis of a common methodology. A programme of measures including at least risk reduction targets will also need to be drawn up. The project will contribute to the development of the common risk assessment methodology as well as*

a harmonised toolbox of mitigation measures and to the adaptation to climate change impacts.

ENV.2008.1.3.3.2. Preparedness and risk management for flash floods including generation of sediment and associated debris flow

Flood risk management in the case of flash floods, associated events and generation of sediment and debris flows in these extreme events will be analysed using and capitalising on ongoing research on forecasting and warning systems for flash floods. Focus needs to be given to flash flood risk management, included specifications for associated debris flow, taking into account issues such as the required resolution for this type of events and socio-economic, land use and climate change impacts. The part of the study on the debris flow will consider natural and anthropogenic debris as well as floating and bed borne debris. Within the frame of a multi-factor setting analysis, aspects like climate change, land use –urbanisation, planning and deforestation, will be analysed and integrated into the solution. There will be an analysis of the driving factors determining the choice of responses and measures to flash floods events, including economical and social assessments. The ultimate aim of this topic is to contribute to reduce loss of life and economic damage as well as to contribute to sustainable development through reducing damages to the environment. The project should produce methods and tools to be used by practitioners.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact:** Improve the understanding, preparedness, risk management and measures for the reduction of flash flood risk. In addition, it will produce fundamental elements for management of debris flow associated with floods. Provide a direct input to the implementation of the upcoming Flood Risk Management Directive and to produce key elements to be used for practitioners responsible for flood risk management and associated effects and damages. It will contribute to the adaptation to climate change impacts. The impact is expected in a short to medium term and the topic has policy relevance.*

Area 6.1.3.4. Multi-risk evaluation and mitigation strategies

ENV.2008.1.3.4.1. Natural hazards in Europe: Coordinated research strategy between European and national levels

The objective of this activity is to capitalise the important know-how acquired so far in the different fields of natural hazards, vulnerability and risks and multi-risks research and to elaborate a (Pan-)European science plan that would contribute to the Hyogo framework for action and would enable a European vision and its complementarity with national efforts with the help of the ISDR national platforms and key Natural Hazards communities). In addition, a European symposium should be planned towards the end of the project in order to present to key stakeholders/ end users the key messages of research results along the disaster cycle and to discuss the future perspectives. Series of summer courses for young researchers dedicated to relevant state-of-art knowledge and emerging science should be planned as a dissemination tool. This action would also contribute to the International Year of Planet Earth 2007-2009.

Funding scheme: coordination and support actions (coordinating type)

Expected impact: *Elaboration of a vision document that will highlight and contribute to the future research questions on European level in the context of ISDR. Disseminate through a final symposium and dedicated courses state-of-the-art knowledge in hazards, vulnerability and (multi) risk science for better prevention and mitigation strategies and actions. Improve coordination between European and national level research activities and programmes.*

Activity 6.2. SUSTAINABLE MANAGEMENT OF RESOURCES

Research to be undertaken within this area should address significant environmental issues, namely those related to resource management within the context of climate change and climate variability, reinforce the process of integration (ERA), whilst promoting greater multi-disciplinary and multi-sectoral research. The programme also aims at establishing a world-class European capacity that can deliver data and information for natural and man-made resource protection and management, play the leading role in addressing environmental issues and the management of natural and man-made resources at the regional, European and global scale and transferring new knowledge, data and information to end-users.

Improving resource use patterns is at the heart of this programme. The size of the projects and the partnership must assure a real impact on the way scientific issues are addressed, on the deliverables, and on the opportunities for knowledge transfer, including towards the EU policy framework.

Research will improve the knowledge on environmental patterns and processes and develop advanced models and tools needed for the protection and the sustainable management of resources, conservation of biodiversity and sustaining ecosystem services.

International cooperation is encouraged.

Sub-activity 6.2.1. Conservation and sustainable management of natural and man-made resources and biodiversity

Indicative available budget: EUR 30 million

Rationale of the 2008 work programme

The proposed topics are high on the political and/or EU policy agenda, i.e. that contribute to the environmental policies, such as the 6th Environmental Action Plan, the related Thematic Strategies and several important initiatives such as the Water Framework Directive, the EU-ICZM (Integrated Coastal Zone Management) and NATURA 2000.

The call is for projects with a true European dimension and relevance aimed at developing innovative approaches to crucial issues, addressing the broad range of environmental, economic, institutional and ecological conditions encountered in Europe, gathering multidisciplinary research teams with the objective of developing unifying concepts and models that could later be implemented at community, national and regional levels for the protection and the management of natural resources within the context of climate change.

Area 6.2.1.1. Integrated Resource Management

Not open in 2008.

Area 6.2.1.2. Water resources

ENV.2008.2.1.2.1. Groundwater systems

Based on existing and currently developed knowledge and models, integrated research should be conducted to further highlight the interactions between groundwater, surface water and related dependent ecosystems in a changing environment. Dynamics and time scale of groundwater renewal and implications for water management in the context of anthropogenic impacts and climate change should be addressed in both quantity and quality (pollution) aspects. Research should focus on unknown bio-geo-chemical processes occurring within the aquifers and the related ecosystems, soils and sediments in order to derive new information on how to safeguard groundwater chemical and ecosystem quality and assure adequate groundwater renewal. A concept and scenarios should then be developed to advise on the legal and institutional frame that could/should be developed in order to better assess groundwater quality and risks affecting this quality, design appropriate measures to protect water resource and the capacity of ecosystems to deliver its services and functions in relation to water quantity and quality and to manage groundwater resources in a sustainable manner.

(Policy relevant topic)

Funding scheme: collaborative project (large-scale integrating project)

Expected impact: *The results of the project should allow member states and the EC to address the great challenges of the new Groundwater Directive and establish the scientific basis for its review planned in 2013. The results should in particular facilitate the formulation, the implementation and the assessment of cost-efficient packages of measures, guarantee actual and potential legitimate uses of groundwater, to protect connected surface water and groundwater dependent terrestrial ecosystems and to assure a high-quality groundwater renewal in the context of environmental changes (climate change, changes in landscape and agricultural practices, etc.). It will contribute to the adaptation to climate change impacts.*

ENV.2008.2.1.2.2. Clustering River Basins Twinning Initiatives and knowledge transfer

The objective is to establish a co-ordination action clustering past and ongoing Twinning European/ third countries river basins projects in order to enhance their overall impact to the implementation of the EU Water Initiative (WI), to promote a better inter-project co-ordination, and to improve synergies. The action should review, assess, synthesize and consolidate projects outcomes and results, elaborate methodologies for "scaling-up" the results and make them transferable to other river basins within the targeted EU WI geographical regions. It should also identify and formulate best practices, methodologies, strategies and tools for a more efficient and effective technology transfer, strengthening institutional capacity, enhancing local awareness, developing human resources and capacity building, promoting proactive stakeholders' participation and improving communication interfaces between policy, stakeholders and civil society. Emphasis must also be given to the setting up of efficient platforms for an effective dissemination and exploitation of results targeted towards the relevant authorities, stakeholders and end users in the concerned regions in order to assist these regions to adopt Integrated Water Resource Management approach. International cooperation is encouraged.

Funding scheme: coordination and support actions (coordinating type)

Expected impact: *Better co-ordination and enhanced synergies between the past and ongoing twinning river basins projects in order to take stock of achievements so far and to implement methodologies for enhanced transferability, applicability and exploitation of the research results by the relevant authorities, stakeholders and end users in the EU WI targeted regions to enable them to adopt sustainable water resources management plans and programmes.*

ENV.2008.2.1.2.3. Assessing the ecological status of water bodies

Development of *methodologies, models, integrated indicators and multi-species metrics to be used in integrated assessment of the ecological status* of water bodies to evaluate and quantify the combined effects of pressures due to global change (land use, pollution, climate change) and catchment management measures. All surface water categories should be addressed, however, new data collection should focus on lakes, transitional and coastal waters.

Inter-calibration of methodologies used for biological quality assessment, definition of reference conditions and thresholds for ecological quality classes to promote EU-wide harmonisation in the area and to underpin the characterisation and status classification of the water bodies. Specific attention must be paid to uncertainties, their quantification and inclusion in the assessment of the current state of the water body and in the predicted outcomes of management measures including their cost-effectiveness. **(Policy relevant topic)**

Funding scheme: collaborative projects (large-scale integrating projects)

Expected impact: *The research should contribute in a concrete way to the implementation of the Water Framework Directive and assist the member states to establish the programme of measures as foreseen by WFD and the subsequent assessment of these measures. Intercomparison of methodologies is expected in view of identifying the most relevant one(s) for a coherent implementation by all member states.*

Area 6.2.1.3. Soil research and desertification

ENV. 2008.2.1.3.1. Assessment of methods to combat desertification

The objectives are the assessment of methods to combat desertification (cost benefit analysis of the efficiency of prevention and restoration techniques); to document, implement and upscale best practices including traditional knowledge and management strategies and opportunities offered by innovative technologies; to develop education material raising public awareness; and to focus on sustainable land management and soil protection policies. International cooperation is encouraged. **(Policy relevant topic)**

Funding scheme: coordination and support actions (supporting type)

Expected impact: *Innovative schemes and methodologies for knowledge transfer and application, for education and raising awareness, including in developing countries. The work should support the objectives of the UN Convention on Desertification and the Soil Thematic Strategy, and be consistent with the principles contained in the recently adopted 10-years Strategic Plan and framework for the implementation of the UNCCD, particularly as far as the scientific dimension of the Convention is considered.*

Area 6.2.1.4. Biodiversity

ENV.2008.2.1.4.1. Improving the capacity to protect and manage the biodiversity of continental waters

The project should develop models to investigate and predict how freshwater biodiversity and the services it provides respond to outside influences, including social and economic pressures and climate change, at scales from the local to the global. The project will provide the tools to analyse and detect changes in distribution patterns and conservation status of species and habitats of community or special scientific interest at appropriate scales of space and time. To achieve this, it should link distributed databases of partner organisations and others to create a federated platform with a well-designed portal. This will allow scientists across the world to share updated scientific knowledge biodiversity and management regimes. The project will identify critical gaps in information and act to fill those gaps where possible. The project will include measures to ensure that any properly qualified organisation may supply appropriate data through the platform, and that the platform is properly maintained after the end of EC financing. Where possible, any rival consortia should agree beforehand that they will collaborate to help to federate appropriate data sets. To help to insure wide inclusiveness, proposals may include funds to help organisations that are not in the consortium to link their databases to the portal. The main emphasis of the project will be on the research that is enabled by federating the data. Significant effort will be devoted to outreach and awareness-raising of issues and results among scientists, policy makers and the public. **(Policy relevant topic)**

Funding Scheme: collaborative project (large-scale integrating project)

***Expected impact:** Improved assessment of status, trends and distribution of all aquatic habitats and species of Community interest and of freshwater habitats and species of policy relevance. Support to the implementation of the Nature Directives through better capacity to inventory and manage protected areas including Natura 2000 sites. Support to the work of EU and international environmental agreements, including the Convention on Biological Diversity and the RAMSAR Convention. Improved and more effective reporting by Member States with respect to EU and international obligations. Increased capacity to integrate biodiversity into relevant sectoral policies; better capacity to assess conservation status and trends of aquatic species; improved early warning capacity for invasive species; improved (single portal) access to distributed data; establishment of common data standards and quality assurance procedures to render key European and national biodiversity databases interoperable.*

ENV.2008.2.1.4.2. Rehabilitation of data from biodiversity-related projects funded under previous framework programmes

The project should retrieve, archive, maintain and provide public access to data from biodiversity-related projects funded under previous framework programmes. For each project or database, the data and associated metadata should be described and assessed, as well as the purpose, quality and completeness of the dataset, its maintenance and accessibility, and the reasons or context leading to the observed state of affairs. It should contribute to initiatives to develop biodiversity related data infrastructures (e.g. LIFEWATCH, the Global Species Information System for Biodiversity). Long term sustainability, maintenance and hosting of

rehabilitated databases, datasets and other information of scientific interest should also be addressed.

Funding scheme: coordination and support actions (supporting type)

Expected impact: Increased value for money of past research; better dissemination of results; improved probability of reuse of data; improved scientific predictive capacity; increased effectiveness and decreased costs of follow-on work.

ENV.2008.2.1.4.3. Increasing the integration of biodiversity research results into policy making

Research will examine the reasons for the generalised lack of recognition in policies and in social behaviour of the extent to which biodiversity underpins livelihoods and ecosystem services in Europe and elsewhere. The project will analyse and explain the reasons for the relative emphasis placed on biodiversity targets and indicators relative to other reasons or mechanisms for encouraging behaviour that may reduce negative human impact on biodiversity. It will design mechanisms to improve the effective integration of consideration of scientific, ethical, moral and stewardship principles into policy making on issues that have impacts on biodiversity and contribute to the implementation of the Convention on Biological Diversity. The work would not seek to amass new data, but to use existing studies and experiences to gain insight into how research discoveries can better inform policy making processes and will help to identify and assess any additional action needed and best practices for the development of science-policy interfaces. The work will involve Civil Society Organisations (CSO), research and public institutions, and the business community wherever relevant. **(Policy relevant topic)**

Funding scheme: coordination and support actions (supporting type)

Expected impact: Improved support to the work of EU and international environmental agreements, including the Convention on Biological Diversity; contribution to an EU mechanism for independent, authoritative research-based advice to inform policy implementation and development; improved understanding of means to facilitate scientific communication with policy making at national, EU and international levels; development of innovative tools and methods to integrate scientific knowledge into policy making and implementation; more effective increased use of scientific expertise in decision-making, including identification of examples and best practice to encourage the inclusion of scientific knowledge in actions; translation of knowledge derived from scientific study, including knowledge derived from natural and social studies, into policy and management strategies; improved communication among stakeholders and between scientists and policy makers; improved capacity of prediction of impact of policy on biodiversity, improved capacity to access scientific advice on drivers of biodiversity change and threats arising from those changes; improved capacity to respond to policy makers about the costs or not reaching the 2010 targets and the losses to biodiversity from not taking action; improved capacity to respond to stakeholder concerns about potential threats; reduced time between the achievement of scientific results and integration in policy; improved role of Civil Society Organisations and research bodies in absorbing science in policy.

ENV.2008.2.1.4.4. Scale dependency of sustainable use of biodiversity

Research should contribute to improve the understanding of how combinations of natural and anthropogenic processes (including large scale geophysical and habitat dependencies and small scale relations between biota) interact across scales of space and time, and how processes at different scales interact to cause non-linearities in scale variance. It should also contribute to a better understanding of how fragmentation and its effects vary between species and from scale to scale, and hence how to generalise probable impacts of fragmentation. Research should improve understanding of the viability of populations and ecosystems, and persistence of ecosystem function, under different scales of disturbance and habitat fragmentation. Efforts should aim at better understanding the relationships between ecological, social and economic processes at different scales and their impact on the sustainable use and conservation of components of biodiversity. They should explore and consider evidence for biological thresholds at which loss of diversity of genes, populations and ecosystems become irreversible at different scales. The project should develop and test methods to assess the relationship between sustainable use or management and area requirements for viable population, favourable conservation status and functional ecological networks, taking scale into account. The project should develop methods to integrate data collected from genetic to global ecosystem scales and to understand better up-scaling and down-scaling procedures.

Funding scheme: collaborative project (large-scale integrating project)

***Expected impact:** Better capacity to develop ways to improve the scale-related effectiveness of policy instruments for conservation and sustainable use of biodiversity. Better understanding of critical distances to ensure regional connectivity of habitats for various species dispersal distances and of how to identify habitat patches that may be critical to regional connectivity (especially important for Natura 2000 and other networks of protected areas). Improved capacity to analyse the coherence and ecological sufficiency of networks of protected areas, taking scale into account.*

Area 6.2.1.5. Urban development

Not open in 2008.

Area 6.2.1.6. Integrated forest research

ENV.2008.2.1.6.1. Development of adaptive forest management models

Global change with increasing temperatures and CO₂ concentration, as well as increasing demands for new forest based products and services (e.g. bioenergy and ecotourism), is posing new challenges to forest and forest managers. The number of services that society expects and requests from forestry has increased, moving from the traditional wood production to provision of a broad range of goods and services. It is well acknowledged that contribution of forests to sustainable development will be negatively affected by climate change, in many environmental, social and economic aspects. Research should thus be targeted to the development of adaptive forest management approaches focused at

consolidation of traditional silvicultural use with the use as an energy source (e.g. whole tree harvest), use for recreational and other social aspects (e.g. tourism), use for protective functions (e.g. ground water quality and erosion prevention) as well as use for nature production in a sustainable way. The capacity of different silvicultural and management strategies to reduce the risks and consequences of different threats should also be assessed. Expected results should support decision-makers in forestry by providing improved decision support tools including scenarios for future forest management and land-use.

Funding scheme: collaborative project (large-scale integrating project)

***Expected impact:** New information and models for adaptive forest management in Europe taking into account environmental, economic and societal changes on forests for their sustainable use. Expected results should support decision-makers in forestry by providing them with improved decision support tools including scenarios for future forest management and land-use as well as for risk assessment and risk mitigation in a regional landscape context. It will contribute to the adaptation to climate change impacts.*

Sub-activity 6.2.2. Management of marine environments

Indicative available budget: EUR 20.5 million

Rationale for 2008 work programme

The proposed topics are important to achieve new progress in generating information and data that are needed for the protection of the marine environment and the sustainable use of its resources. This sub-activity intends to contribute to designing and implementing the Common Fisheries Policy, the Thematic Strategy for Marine protection, and the future EU Maritime Policy, and it will also be important in the context of the U.N. Law of the Sea - UNCLOS). The ecosystem approach is a central principle to reconcile the short-term objective of the sustainable use of marine resources with the long-term objective of marine ecosystem protection. This is why the ecosystem approach is central to this programme.

The topics will be important for the sustainable management of marine and coastal ecosystems in the context of global climate change. They will promote co-operation and integration at the European (and global) scales, continuing to build the European critical mass necessary to achieve the required visibility and to help build the European Research Area (ERA).

Area 6.2.2.1. Marine resources

ENV.2008.2.2.1.1. Monitoring and Evaluation of Spatially Managed Areas (SMA)

The seas around Europe are home to an exceptionally wide range of seabed habitats and their associated biodiversity, whilst also supporting a variety of marine industries. These multiple uses can lead to increasing challenges for marine environment managers, such as conflicts between users, or between economic interest and conservation requirements, and there is a greater potential for degradation of the marine ecosystems. Therefore, access to information about the distribution and quality of seabed habitats is essential for effective sustainable management. Research under this topic should develop special science-based guidelines, criteria, concepts and models to implement, follow-up, monitor and evaluate spatially managed areas for the integrated uses of the ocean and its resources. This should include the identification and classification of essential marine habitats starting from the existing data sets and maps in order to help end users to better understand the ecological status of the species and the impacts of anthropogenic activities. It should also support the spatial component of the management of resources in the marine environment and be used to develop management zoning schemes within Marine Protected Areas (MPAs). Geological information for both the surface and subsurface should be integrated with the Digital Terrain Model (DTM), linking both surface and subsurface information. Geological structures that are significant for geo-hazard assessment should be identified with criteria that are well established as well as novel.

(Policy relevant topic)

Funding scheme: collaborative project (large-scale integrating project)

Expected impact: *The research under this topic should contribute to marine spatial management and in this way foster the sustainable development of European seas and*

coastal areas. The research work should provide inputs to the several actors and bodies at all levels of governance to develop innovative and integrated marine spatial management strategies and tools, taking into account the regional and local specificity, reflecting the diversity of Europe's seas and coasts and the socio-economics associated to marine spatial management. The project should also generate improved interfacing mechanisms among science, policy and decision makers and the public in general in the management process. It will contribute to the adaptation to climate change impacts.

ENV.2008.2.2.1.2. Deep-Sea ecosystems

Research under this topic will require an integrated approach involving many disciplines including genomics, microbiology, biology, geochemistry, sedimentology, geophysics, physical oceanography, modelling and socio-economics. It must also link scientists, NGOs, marine industry and policy makers, as well as maintain a large outreach programme.

Topics to be addressed include:

Natural change in deep-water ecosystems especially related to anthropogenic impact and climatic change.

The importance of episodic, large-scale events, in driving ecosystem change in the various ecosystem hotspots.

Distribution and interconnection of ecosystems on a broad scale, e.g. along margins, between canyons or between coral colonies.

Understanding the biological capacities of marine organisms that underlie the ecology of deep-oceanic ecosystems. Approaches can include the genomic analysis of natural communities to understand how biodiversity supports ecosystem function.

Integrated understanding of the ecological, societal and economic implications of the human interactions with deep-sea ecosystems and options for the conservation of deep sea biodiversity and the governance of the deep sea.

Funding scheme: collaborative project (large-scale integrating project) (Community contribution from EUR 4 000 000 up to 8 000 000)

Expected impact: *The enhanced integrated scientific knowledge on the functioning of deep-sea ecosystems within the overall framework of the Deep-Sea Frontier initiative should aim at protecting the ecosystems and using their resources in a sustainable manner. The outcome of the project should comprise socioeconomic valuation of deep sea ecosystem goods and services, identification and assessment of the drivers of change in anthropogenic interactions with deep sea ecosystems, including public attitudes, governance regimes and principles, and different policy instruments, ecosystem-based management tools and strategies, including integrated inter-sectoral management approaches and integrated sustainability assessments, interfacing science and policy to inform decision-making, in particular integrating natural science and socio-economic research on the deep sea, including planning, translation and dissemination of research.*

ENV.2008.2.2.1.3. Ecosystem approach to marine environment and resources

Research under this topic will require a trans-disciplinary and integrative ecosystem approach, combining an improved understanding of the functioning of Europe's marginal seas and the direct and indirect impacts from their uses (e.g. by aquaculture, fisheries, extraction of minerals, etc.), on the water quality and ecology, in order to contribute to the development of sustainable use patterns through an ecosystem-based management. Research should address the following elements:

Socio-economic valuation of coastal and shelf seas in view of their goods and services, evaluation of the costs of non-action, costs of improved assessment and monitoring programmes in support of the implementation of the EU Marine Strategy;

Assessment of the combined impacts from aquaculture, fisheries within the EEZ (Exclusive Economic Zone) (EEZ) of the Member States, extractions of minerals, oil and gas, eutrophication, shipping, release of land-based pollutants into the coastal zone, tourism, etc. on the marine ecosystems. **(Policy relevant topic)**

Funding scheme: collaborative project (large-scale integrating project)

Expected impact: *The new knowledge and tools should contribute to the protection of marine ecosystems and the sustainable use of their resources in a changing environment. It should also contribute to generate innovation ecosystem-based management tools and strategies, including integrated inter-sectoral management approaches and integrated sustainability assessments. Interfacing science and policy to inform decision making, in particular integrating natural science and socio-economic research on the marine environment, including planning, translation and dissemination of research. Tools for conflict resolution should also be generated.*

Activity 6.3. ENVIRONMENTAL TECHNOLOGIES

"Coping with the availability of resources" is the unifying subject for the 2008 Work Programme in the field of Environmental Technologies. Why? The growth of the world population, the dramatic increase of the world consumption of resources, pollution and its impact on climate and on the earth system are putting our future at risk.

Decoupling growth from resources depletion is not only an obligation from the environmental perspective, **but it is also becoming an economic obligation** in order not to make the costs of pollution and climate change excessive – as it was shown in the Stern Report – and not to transfer the costs only on the shoulders of future generations.

The cost of non-action is already too high. Resources can no longer be considered abundant or – like for cyclic ones, as water – even infinite, whenever their use implies the consumption of fossil fuels – with generation of GHG – and the production of non-recycled waste.

Moreover, nowadays cyclic resources – like water – become scarce not only in the areas of the world where a structural deficit exists, but wherever a gap between demand - from all sectors - and availability in quantity and quality emerges, or whenever pollution makes the resource more difficult to exploit.

Resources can be of natural origin – like water, soil, mineral resources – or, as the result of human activities, they can have been transformed in goods and infrastructures that at their end-of-life need to be recycled and re-used.

A sustainable circular – and de-carbonised - economy implies that emission of pollutants and GHG is prevented (or minimised), dangerous substances are substituted or not released, generation of wastes is minimised or avoided, whenever possible wastes are recycled by exploiting the highest possible added-value, and safe final sinks are provided for the non-recyclable-reusable fractions.

The various topics proposed for the WP 2008 for environmental technologies contribute in different ways to the same overall goal, of making the use of available resources compatible with their long-term availability in space, time, quantity and quality.

Sub-activity 6.3.1 Environmental technologies for observation, simulation, prevention, mitigation, adaptation, remediation and restoration of the natural and man-made environment

Indicative available budget: EUR 39¹² million

Rationale for 2008 Work programme

"Coping with the availability of resources", as it is said before, has been reflected in the choices for most of the topics of this sub-activity. For water resources, a large initiative is launched for approaching the problem of rehabilitation of surface- and groundwater resources that suffer from problems of availability in terms of quantity and quality. Soil contamination is linked to this approach, because it impacts very substantially on the quality and availability of surface and ground-water. Specific projects will approach the use of nanotechnologies for water treatment.

In the industrial waste sector, a large initiative is proposed for preventing waste to be generated through industrial networking, and it will be linked with smaller and more oriented projects aimed at developing technologies for recovering high added-value products from selected waste streams. In the view of removing a cause of diffuse pollution that may threaten the use of already scarce water resources, the development of alternative options for substituting brominated flame retardants is today a priority, and may be considered as a prototypical initiative with respect to other families of dangerous chemicals which are today incorporated in many different final products, due to the difficult availability of substitutes for specific uses that may show better environmental impact.

Finally, the initiative proposed for building materials is intended to result in a massive saving of resources in a sector that needs to improve considerably its overall environmental footprint. Maintenance, use and renewal of the built environment place an enormous strain on our struggle to protect the natural environment and manage its resources in a sustainable way.

Area 6.3.1.1. Water

ENV.2008.3.1.1.1. Rehabilitation technologies for degraded water systems presenting quantity and quality problems

This action should promote the development of innovative rehabilitation technologies for degraded surface water and groundwater systems (e.g. rivers and streams, lakes and reservoirs, wetlands, coastal aquifers, etc.) to provide sustainable environmental solutions and the design of generic restoration guidelines and rehabilitation standards that may meet compliance needs towards regulations. Emphasis should be given to technology developments that integrate engineering, physical, biological and ecological sciences. Research proposals

¹² Within this indicative budget, EUR 5 million is foreseen for a joint call with Theme 4. Nanosciences, Nanotechnologies, Materials and New Production Technologies on "Nanotechnologies for water treatment"

should integrate different case studies (including locations from outside Europe, if appropriate) addressing large scale complex problems combining a wide range of risks, problems sources and degradation processes, and cumulative, synergistic and long-term impacts resulting from agricultural practices, existing or developed water infrastructures, urban development and/or industrial activities To help reconciling conflict views and interests in rehabilitation strategies and techniques, particular attention should be given to the acceptability of the designed solutions through end user involvement, public-private synergies, trade-offs and decision-making processes. Indicators and information systems, technology transfer, education and training activities and analysis of the socio-economic benefits of the proposed rehabilitation solutions should as well be addressed. This action should foresee a substantial participation of industrial partners and end-users. **(Policy relevant topic)**

Funding scheme: collaborative project (large-scale integrating project)

***Expected impact:** Current rehabilitation technologies are frequently limited by the fact of not addressing the water system as a whole. The project should contribute to more reliable, ecologically engineered and cost-effective technological solutions, which also take into account the impacts of climate change on water bodies, mitigation and adaptation policies. It should also help decision makers to assess the immediate and long-term effectiveness of restoration actions and to design appropriate environmental planning and optimal investment strategies at regional level, in line with the requirements of various water related EU policies.*

ENV.2008.3.1.1.2. Nanotechnologies for water treatment

Nanotechnology presents many benefits for environmental technology applications, such as remediation, treatment or sensor development and monitoring purposes. In the field of water, nanotechnology has the potential to contribute to long-term water quality, availability, and viability of water resources such as through advance filtration that enables sustainable water reuse, recycling or desalination. The aim of this action is to support research and technological development in the field of water treatment by applying developed or adapted nano-engineered materials to promising separation, purification and/ or detoxification technologies. Proposals should focus on process intensification aiming at improving selectivity, robustness, stability and performance while reducing energy requirements and by-product generation. Specific monitoring issues, as well as safety, environmental and health aspects, should be included if directly associated with the new technological solution proposed. Priority will be given to novel ideas and emerging technologies promising major advances and a large potential impact in the long-term, including cost-effectiveness.

Funding scheme: Collaborative projects (small or medium-scale focused research projects), the requested Community contribution shall not exceed EUR 2 500 000

Specific features: This topic is implemented jointly with Theme 4. Nanosciences, Nanotechnologies, Materials and New Production Technologies (NMP). See the call fiche in chapter III (call identifier FP7-ENV-NMP-2008-2).

***Expected impact:** Development and uptake of innovative and cost-efficient water treatment technologies benefiting from progress and advances made in nanosciences, materials and technologies. This initiative should deliver step-change advances in water treatment technologies, including validation and verification of arising prospects in terms of improving treatment performance and reducing*

energy requirements. By fostering the knowledge base in this area, the projects addressing this topic will contribute to strengthening European competitiveness in the water sector and the implementation of the Environmental Technologies Action Plan and the Nanotechnology Action Plan.

Area 6.3.1.2. Soil

ENV.2008.3.1.2.1. Recovery of degraded soil resources

Contamination is one of the most important threats to which European soils are exposed. The concern refers both to contamination of soil in itself and to the risk for other compartments, mainly water and food production, which affects ecosystems and human life. Remediation technologies are needed, effective both in decontaminating and in preserving soil quality and functions, including biodiversity, at affordable costs. Innovative technologies (including “new frontier” promising technologies) should be developed or improved, quantifying the natural rehabilitation potential of the soil, integrating existing knowledge on biological techniques with most promising *in situ* remediation treatments. The impact of remediation activities on soil functions should be specifically addressed. This action should address problems that clearly show a broad EU dimension or may be common to several Member States, with priority to be given to complex problems where cost-effectiveness is today the major obstacle. This action should foresee a substantial participation of industrial partners, with a relevant presence of SMEs. **(Policy relevant topic)**

Funding scheme: collaborative projects (small or medium-scale focused research projects)

Expected impact: *According to the Thematic Strategy for Soil Protection, soil contamination is one of the main threats to which soils in the EU are confronted. The strategy asks Member States to ensure that contaminated sites are remediated. Project proposals should demonstrate to be able to achieve substantial improvement of the technologies for soil remediation in terms of sustainability (also in terms of GHG generation), persistence, and cost-effectiveness.*

Area 6.3.1.3. Waste

ENV.2008.3.1.3.1. Waste prevention: Industrial networking and zero-waste entrepreneurship

The development of innovative technologies, waste-prevention methodologies, strategies and system tools (e.g. eco-design, local industrial clusters, and resource exchange) exportable into other European and worldwide contexts shall represent the main focus of this action. The goal is to develop a structured and innovative production model for resource-use optimisation and waste prevention, also taking residues as secondary raw materials, and test it in real cases of sustainable industrial networks. Results should translate the vision of a sustainable development into elements of a sustainable entrepreneurship, focusing at enhancing business opportunities according to a "towards zero waste" approach. This action should also be capable to provide evidence and directions on how to implement the main EU policy

initiatives in this area (Sustainable Consumption and Production, ETAP, Eco-label, EMAS, Waste Framework Directive, ELV Directive) in a coherent, integrated, and sustainability oriented way, *inter alia* by identifying and assessing policy measures that could be taken at EU, national or regional levels to favour the development and the uptake of industrial networking and zero-waste entrepreneurship and achieve waste prevention. Assessment studies shall be carried out¹³. This action should foresee a substantial participation of industrial partners, with a relevant presence of SMEs. Additionally, this project should establish links with other projects addressing innovative product chains with a Life Cycle Approach (i.e. biorefineries). **(Policy relevant topic)**

Funding scheme: collaborative project (large-scale integrating project)

Expected impact: *The assessment of the life cycle benefits and costs for achieving the main EU environmental resource-related targets (in the context of the industrial networks assessed) will be a measure of the outcomes of this action. Looking at the whole process chain of the involved industrial networks, results should contribute to achieve at least two of the following goals: (1) a decrease of at least 30% of greenhouse gases emissions, (2) at least 70% of overall re-use and recycling of waste, (3) a reduction of at least 75% of fresh water utilisation.*

ENV.2008.3.1.3.2. Technologies for high added value production from waste

The goal of this action is the development of innovative and cleaner technologies (thermal, chemical, mechanical, etc) that could lead to the production of high added value products from waste. The input materials should preferably be end of life products and production residues of high technological and economic value (e.g., composite materials, carbon fibres, glass fibres, etc.) and/or waste flows containing high carbon content (e.g. waste tyres). The potential consequences deriving from the full-scale implementation of the developed technologies on Carbon balance and the release of greenhouse gases should be adequately investigated. Assessment studies shall be carried out¹⁴. This action should foresee the substantial participation of industrial partners, with a relevant presence of SMEs.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

Expected impact: *This action should lead to the development of one or more prototype(s). The process(es) developed should guarantee at least 30% material recycle and 80% recovery (including energy recovery) of the input material weight calculated as dry mass.*

¹³ Environmental Life Cycle Assessment studies (ISO 14040 conform), Life Cycle Costing analyses, and Life Cycle Social Assessments shall be carried out. All the environmental LCA data resulting from the real case studies shall be made available to the European Platform for LCA according to its data format and quality requirements. Other tools for process evaluation (e.g. entropy and exergy analysis, material and energy flow analysis, cost-effectiveness analysis, etc.) could be applied.

¹⁴ Environmental Life Cycle Assessment studies (ISO 14040 conform), Life Cycle Costing analyses, and Life Cycle Social Assessments shall be carried out. All the environmental LCA data resulting from the real case studies shall be made available to the European Platform for LCA according to its data format and quality requirements. Other tools for process evaluation (e.g. entropy and exergy analysis, material and energy flow analysis, cost-effectiveness analysis, etc.) could be applied.

Area 6.3.1.4. Clean Technologies

ENV.2008.3.1.4.1. Substitution options for Brominated Flame Retardants (BFRs): a prototypical case for source control of Priority Pollutants in a Life Cycle Thinking perspective

Brominated flame retardants (BFRs) are chemicals used to make foam, textiles, electronics, and other products fire resistant. They are included in the list of priority pollutant as a hazardous priority pollutant, and its use will be phased-out. There are currently raising concerns about their persistence and toxicity and therefore, in light of this mounting evidence, a review of safer alternatives, meeting relevant fire safety standards, is necessary. Less toxic safer chemical substitutes appear to be already available for some applications. However, detailed risk assessment and viability information for the industrial implementation of potential substitutes are only partly available. Research should analyse the viability for the industrial implementation of safer alternatives, including product capability and application aspects, environmental and health hazard identification and characterisation, risk assessment, and socio-economic assessment in a life-cycle perspective. Assessment studies on the various substitution options shall be carried out¹⁵. This action should foresee the substantial participation of industrial partners, with a relevant presence of SMEs. **(Policy relevant topic)**
Funding scheme: collaborative projects (small or medium-scale focused research projects)

***Expected impact:** This activity should produce applicable results for defining sustainable alternatives to BFR, thus contributing to the phasing out of this substance as suggested in the Water Framework Directive. Risk assessment data on alternatives should help policy definition.*

Area 6.3.1.5. Built environment

ENV.2008.3.1.5.1. Innovative environmental technologies including design concepts and materials for the reduction of damage to the environment

New concepts and materials to reduce environmental impacts of the built environment (such as consumption of water, energy, raw materials; land-use; generation of noise, vibration, waste and; negative impacts on quality of air, soil or water), without loss of performance. Consideration may be given amongst others to new technologies such as biomaterials, or new construction products that facilitate recycling and the deconstruction of buildings and infrastructure, etc. Projects should quantify and demonstrate the extent to which they offer more sustainable solutions than present construction practices. In order to ensure the effective up-take of the new technologies, all technical and non-technical barriers must be adequately

¹⁵ Environmental Life Cycle Assessment studies (ISO 14040 conform), Life Cycle Costing analyses, and Life Cycle Social Assessments shall be carried out. All the environmental LCA data resulting from the real case studies shall be made available to the European Platform for LCA according to its data format and quality requirements.

considered in the research proposal. This action should foresee a substantial participation of industrial partners, with a relevant presence of SMEs.

Funding scheme: collaborative projects (small or medium-scale focused research projects)

Expected impact: *The proposed innovative technologies should provide significant reductions in the demand for natural raw materials, fuels and energy. Project should significantly contribute towards the uptake of more sustainable construction practices, towards meeting the Kyoto protocol obligations and reducing Europe's reliance on imported energy. It should also contribute to the adaptation to climate change impacts.*

Area 6.3.1.6. Marine environment

ENV.2008.3.1.6.1. Development of automated sensing technologies for estuaries, coastal areas and seas

Estuaries and coastal areas are extremely important as source of nutrients, sediments and pollutants for the marine environment. Sustainable fishery activities require a detailed knowledge on their input. Moreover, monitoring is necessary to assess the impact of climate change on key parameters for aquatic systems as defined by European policies and initiatives such as the Marine Thematic Strategy and the Maritime Policy Green Paper. This demands sophisticated monitoring technologies where gliders (but also profilers or AUV) and buoys equipped with sensors could play an important role. Examples of parameters to be measured with adequate spatial and temporal resolution include, but are not limited to, nutrients, pollutants, chlorophyll, Carbon species, micro-organisms, and selected physico-chemical parameters (e.g. pH, O₂, T). The projects should produce clear and measurable advances – in relation to a selection of the key parameters and to the system operation - with respect to sensor miniaturisation, energy consumption, robustness, long-term accuracy and overall system performance (interoperability, data management, capital and operational costs, etc.). The prototype sensors should be developed to a level that will allow them to move to market as a next step. The participation of SMEs is particularly encouraged.

Funding scheme: collaborative projects (small- or medium-scale focused research projects)

Expected Impact: *The developed technologies should be shown to reinforce the benefits of autonomous monitoring systems for the marine environment. Furthermore, they should ensure the enhancement of Europe's sea monitoring capability, leading to the creation of market opportunities for the European private sector.*

Sub-activity 6.3.2. Protection, conservation and enhancement of cultural heritage, including human habitat

Indicative available budget: EUR 9 million

Rationale for 2008 Work Programme

The most relevant proposed topic for 2008 aims at developing methods and technologies to better monitor and prevent damages and impacts on the moveable and immovable cultural heritage resulting from environment and climate changes, while excluding the extreme events which will be addressed in a following call for proposals. These research objectives are also in line with research orientations which have been recently recommended in expert committee meetings of UNESCO World Heritage Centre. This subject will build upon and go well beyond first results obtained in FP6 that showed the potential benefits that may come from this new research domain.

The two following subjects reflect discussions held in the Focus Area Cultural Heritage of the European Construction Technology Platform. The first one deals with tracking the "change of state" of both movable and immovable cultural assets leading to the concept of a "cultural heritage identity card", also related to the traceability of the movable assets. This is of outmost interest for owners, managers and a wide range of actors in this field.

The second one deals with the applicability, cost effectiveness and possible transfer to the market by industry and SMEs of most promising technologies for the conservation of cultural heritage. In this respect, it is intended to promote the utilisation of those prototypes resulting from past FP5 or FP6 projects which could reasonably give rise to an operational use.

All these measures would also help to better structure and coordinate European research related to the tangible cultural heritage together with the Member States' National activities, also in conjunction with the ERA NET project expected to be established in 2007.

Area 6.3.2.1. Assessment and conservation in cultural heritage

ENV.2008.3.2.1.1. Development and application of methodologies, technologies, models and tools for damage assessment, monitoring and adaptation to climate change impacts (excluding extreme events)

Building on the most recent state-of-the-art and on the achievements of FP5-FP6 projects, the project should develop and apply more reliable methods and modelling tools for damage assessment of the near and far impact of climate change (excluding extreme events) on movable and immovable cultural heritage objects, innovative, cost-effective and appropriate conservation/ adaptation strategies, technologies and related monitoring systems. The project should be based on specific case studies preferentially based on World Heritage Sites located in particular in Europe, in the Mediterranean area and in other areas sensitive to climate change impacts. Research should identify scientific indicators of threats and damage to cultural heritage, for inclusion in future IPCC Reports and other international reporting systems. International cooperation, particularly with Mediterranean partner countries is requested. This action should integrate training activities open to third country trainees – in

the field of monitoring, modelling, design and implementation of adaptation strategies and conservation technologies.

Funding scheme: collaborative project (large-scale integrating project, Community contribution from EUR 4 000 000 up to 5 000 000)

Expected impact: *More reliable and applicable instruments, technologies and decision support tools for predicting and adapting to climate change impacts on cultural heritage. High transferability of results, also beyond Europe. The project should demonstrate the benefit of the application of results for policy-makers, National, Regional and Local authorities as well as cultural heritage managers, owners and curators of historic buildings and collections.*

ENV.2008.3.2.1.2. "EU cultural heritage identity card"

This coordination action should develop a strategy and select most efficient methods and tools for the harmonisation of criteria and indicators to be addressed for tracking environmental changes of the tangible cultural heritage assets, buildings, monuments, and collections, including "natural" deterioration processes and human interventions, including the aspect of traceability for the moveable assets.

Funding scheme: coordination and support actions (coordinating type)

Expected impact: *Projects should be able to demonstrate a significant cost-benefit advantage for all owners, managers, conservators who have in charge to protect the movable and immovable cultural assets and also have to monitor and systematically report all human and natural changes of state to make the most appropriate knowledgeable and economic choice for an effective preventive conservation.*

Area 6.3.2.2. Networking, knowledge transfer and optimisation of results in cultural heritage

ENV.2008.3.2.2.1. Framework conditions to enhance most promising prototypes

Research should target and analyse results of recent FP5-FP6 projects having developed innovative technologies at the level of laboratory or pilot-scale prototypes but still requiring further testing, validation and engineering for operational use and subsequent commercialisation. This action should address the reasons and barriers having prevented the consortia from achieving operational or marketable products, and should demonstrate today's potential for market. End-user involvement, technology transfer and training activities are essential in order to evaluate the applicability and the market potential of the developed technologies. A relevant participation of industrial partners and SMEs is requested.

Funding scheme: Collaborative projects (small or medium-scale focused research projects)

Expected impact: *This action should contribute to the industrial development of such devices and facilitate the transfer into the market by SMEs and potential investors.*

Area 6.3.2.3 Environment technologies for archaeology and landscapes

Not open in 2008.

Area 6.3.2.4 Fostering the integration of cultural heritage in urban and rural settings

Not open in 2008.

Sub-activity 6.3.3. Technology assessment, verification and testing

Indicative available budget: EUR 7 million

Rationale for 2008 Work Programme

In the field of chemicals, a reliable and consistent risk management framework for the introduction of emerging technologies is needed, that takes into account the incorporation of single chemicals in products along their whole life cycle. A project aiming at a methodological development linked to the problems of safety testing is therefore proposed. Beyond the field of chemicals, the ex-ante assessment of technologies is more and more acknowledged as a key step towards the achievement of the Sustainability Development goals. However, in order to shift towards sustainability, adequate assessment tools are required.

Several industrial stakeholders, including many Technology Platforms, are asking our support for the development of a harmonised European approach to Life Cycle Assessment (LCA) methodologies that is aimed at achieving socio-eco-efficient solutions.

The availability of a common method to sustainability assessment of technologies could foster technologies market acceptance, enhancing the competitiveness of European industry worldwide.

What is needed today is a transparent and common method to forecast present and future potential impacts. It is proposed to develop an innovative and harmonized method to evaluate the environmental, economic, and social impacts of existing and future technologies that will then be horizontally implemented in our future research studies.

The coordination action on the Environmental Technologies Verification systems is placed in a shorter horizon, with the very concrete objective of developing an international recognition framework that may help the European ETV system – for which a proposal will be soon advanced by the EC – to be mutually recognised by other ETV systems in the world.

Area 6.3.3.1 Risk assessment of chemicals and alternative strategies for testing

ENV.2008.3.3.1.1. Safety and risk assessment as the basis of risk-based management of chemicals and products in a global perspective and Alternative Testing Strategies

This coordination action among European and national programmes aims at the development of a reliable consistent risk management framework accompanying the introduction and use of new chemicals, products, and technologies by addressing the critical points throughout the product's life cycle to allow for faster and more effective innovation. Starting with the conceptual development of a global strategy for a risk-based management of chemicals, it should address the key elements of a risk management framework applied to the requirements of a circular economy at global scale. The development of the appropriate risk communication strategies should accompany the research and development work in order to close the gap between risk and perceived risk. As an overarching key requirement, the safety and risk assessments necessary for the development of the risk-based management of chemicals should

develop or make use of alternatives to animal tests and in particular of 'intelligent testing strategies' and the full replacement of tests using animals.

Funding scheme: coordination and support actions (coordinating type)

Expected impact: *This action will support the Strategic Approach to International Chemicals Management (SAICM) of UNEP and should contribute to a significant reduction of the risk to human health and the environment posed by the production, trade, use, re-use, recycling of chemicals and products and the respective treatment of waste in a circular economy at global scale.*

Area 6.3.3.2 Technology Assessment

ENV.2008.3.3.2.1. Sustainability Assessment of Technologies

The aim of this research activity is to develop and test a framework methodology, operational method(s), and tool(s) for the assessment of the sustainability of existing and future technologies according to a Life Cycle approach. The framework methodology shall properly consider the relevant ISO standards (e.g. 14040, 14025) and the work done within the UNEP/SETAC Life Cycle Initiative¹⁶. It should be open to and compatible with participatory approaches. The operational method(s) should be applicable to different technology-levels (from base technology up to technology systems) and for technologies at different stage of maturity (from lab- to commercial-scale). These method(s) should support private and public decision-makers in the identification and quantification of environmental (including human health), economic and social impacts – explicitly looking also at the geographical and sectoral links, trends, mutual effects, and trade-offs – caused by large-scale implementation of technologies. Other aspects, like rebound effects, inclusion of accidents and risks, etc. should also be considered, and included at least in a qualitative manner. The feasibility of the developed method(s) and tool(s) shall be tested in a minimum of 4 real case studies. Technology pervasiveness, development stage, and primary data availability should be considered among the criteria for selecting the case studies¹⁷. The output should show balance between the method appropriateness, completeness and user-friendliness of its application. Consortia should be constituted of a balanced mix of academia, research institutions, industrial partners (with a relevant share of SMEs) and/ or European-level industrial associations.

Funding scheme: collaborative project (large-scale integrating project, Community contribution from EUR 4 000 000 up to 5 000 000)

Expected impact: *The use of the developed framework methodology and of the operational methods and tools should improve the capacity of forecasting the sustainability of technologies. The method(s) should be useful in the context of the implementation of several EU policies and actions (e.g. ETAP, Eco-Label, EMAS, IPPC, Energy-using Product Directive, etc.).*

¹⁶ It should also look at the experiences developed in the area of Technology Assessment (e.g. STOA, EPTA, etc.)

¹⁷ All the life cycle data resulting from the real case studies shall be made available, at the end of the project, to the European Platform on LCA according to its data format and quality requirements.

Area 6.3.3.3 Environmental Technologies Verification and Testing

ENV.2008.3.3.3.1. Harmonised approaches towards the development of international technology verification systems

In 2004, the European Commission launched the Environmental Technology Action Plan (ETAP, COM(2004) 38 final). In this context, the establishment of a European Environmental Technologies Verification system is believed to favour and to speed-up the diffusion of innovative technologies into the market through a third-party confirmation of the performance of an environmental technology. Previous RTD efforts have been focussed on establishing European networks of technology performance verification in different sectors. The aim of this coordination action is to support, integrate and coordinate previous and on-going European RTD efforts with existing and fully operating technology verification systems outside the EU (e.g. the US, Canada, Japan, Korea, Singapore, etc.), with the ultimate goal of developing a framework for international cooperation and mutual recognition. The topic is open to all countries outside the EU having an established (or wishing to establish) an Environmental Technology Verification system. **(Policy relevant topic)**

Funding scheme: coordination and support actions (coordinating type)

Expected impact: *Proposals should demonstrate that the proposed schemes and protocols for Environmental Technologies Verification systems have the potential to be recognised internationally.*

Activity 6.4. EARTH OBSERVATION AND ASSESSMENT TOOLS FOR SUSTAINABLE DEVELOPMENT

Research activities will be focussed on the development and integration of the Global Earth Observation System of Systems (GEOSS), within which GMES (Global Monitoring for Environment and Security) is complementary for environment and sustainable development in the context of the GEO (Group on the Earth Observation) initiative (including support to the GEO Secretariat). Interoperability between systems for observation, information management and data sharing, and optimisation of information for understanding, modelling and predicting environment phenomena will be addressed. In relation to the nine societal benefit areas of GEO (natural and human-induced hazards, environment and health, environmental related energy issues, climate change, water management, weather, ecosystem management, sustainable agriculture and desertification and biodiversity), strong emphasis is put on the need to integrate the European Earth Observation related research activities into the global picture.

The sub-activity on "assessment tools for sustainable development" will focus on the further development and improvement of indicators, and on exploring new and innovative approaches to support policymaking for sustainable development. Civil society organisations will be invited to make a contribution to the enhancement of indicators by providing new insights and perspectives. Finally, the sub-activity will explore innovative ways to conceive of the linkages between economic, environmental and social systems in the context of the global dimension of sustainable development.

Sub-activity 6.4.1. Earth and ocean observation systems and monitoring methods for the environment and sustainable development

Indicative available budget: EUR 21 million

Rationale for the 2008 work programme

Although environmental research undertaken within this programme is such that Earth Observation data and activities may be present in many of the topics, e.g. Carbon Cycle, Biodiversity, Environment and Health, Natural Hazards, etc. in most of the cases those contributions to observation science remain somewhat marginal. The sub-activity "Earth and Ocean Observation Systems" will address Earth Observation "per se" through dedicated projects in order to help federate and integrate European efforts as well as bringing the European Earth Observation initiatives in the global context as foreseen through GEO. In this way, specific Earth Observation research will contribute to forward European and international efforts in strategic policy areas, such as climate change and energy. As for the 2007 Work Programme, the Earth Observation sub-activity for 2008 is split into four main sections which are strategic for this activity and comply with GEO requirements, whilst focussing on European fields of interest:

1) Integration of European activities within GEO

Facilitating the integration of European Earth Observation research initiatives relevant to environment in GEO through collaboration with similar existing initiatives in other continents/ countries to contribute to building a Global Earth Observation System of Systems. In the GEO context, the global dimension refers to processes with significant global causes or global consequences, or which require observations enhanced by global systems. Such projects should support the European activities needed to ensure sufficient collaboration at global level. Such projects should also involve international partnerships in order to ensure proper know-how is taken into account, as well as avoiding duplication of efforts.

2) Cross-cutting research activities relevant to GEO

Developing cross-cutting research activities relevant to the societal benefit areas of GEO in the domain of the environment. This area will address interoperability between systems for observation, information management and data sharing (including exploring the possibility to disseminate data through the GEONETCast system) and optimisation of information for understanding, modelling and predicting environmental phenomena. The availability of adequate data sets such as long time series, real-time data and consideration of the geographical coverage needed, will also be addressed. The integration of various source data (e.g. remote sensing and in-situ data) will also be part of this activity.

3) Emerging Earth Observation activities

Supporting the development of European Earth Observation systems and related activities in areas of environmental research needed for GEOSS, where observing/monitoring systems are lacking or need to be significantly improved.

4) Developing capacity building activities in the domain of Earth observation

Providing support to international research initiatives in which Europe would contribute to the development of observing systems. Safeguarding/ protecting observation data for developing countries and aiding the exploitation of observing systems and data.

In 2008 a significant research effort is going to be made through this WP to contribute to the development of necessary architecture and data management approach necessary in Europe to enable broader and easier access to environmental observation data. This research effort will need to comply with the requirements under the INSPIRE directive and will enable harmonisation of the European approach and know-how in the global context, as urgently needed in the tasks overseen by the GEO Architecture and Data Committee. Among the major policy requirements on Energy in Europe, another focus under the 2008 WP is in the domain of Earth Observation and monitoring science necessary to better assess the impact of energy exploitation on the environment, in coordination with similar requirements under the Energy tasks of the 2007-09 Work Plan of GEO¹⁸. Another prominent effort in the 2008 WP will be to launch the necessary research to better monitor and observe oxygen depletion in all the components of the Earth System, which remains a neglected topic, in order to be prepared for the necessary future monitoring of this crucial parameter. Finally, research contributing to capacity building efforts towards the new countries of the EU and third countries, particularly developing countries, in the domain of Earth Observation will be launched in accordance with EU development policy and in keeping with the GEO strategy on capacity

¹⁸ You can find the 2007-2009 GEO Work Plan at <http://www.earthobservations.org/docs/WP0709.v4.pdf>
The document lists these tasks and the ones in the topic descriptions.

building. In this respect, the main objective will be to ensure that developing countries master the technology they require while allowing for their own capacities, knowledge base, institutions and infrastructure to grow without duplication.

Area 6.4.1.1. Integration of European activities within GEO

ENV.2008.4.1.1.1. European Environment Earth Observation system supporting INSPIRE and compatible with the GEOSS (Global Earth Observation System of Systems)

The project will address scientific and technical feasibility and costs and benefits of the European Environment Earth Observation System necessary for the implementation of the INSPIRE directive, bearing in mind global connectivity, interoperability and data sharing. In this context, the project will take into account the Global Spatial Data Infrastructure (GSDI) needed for the GEOSS (Global Earth Observation System of Systems) architecture described in the GEO work plan 2007-2009 tasks AR-07-01, AR-07-02, AR-07-03, and AR-07-04. Such a system should incorporate as much as possible the results and data achieved in Europe in the different GEO societal benefit areas (natural and human-induced disasters, environment and health, energy, climate change, water, weather, ecosystems, agriculture and desertification, biodiversity), through Community research, national research and European research organisations. Research needed to enable the development of the European Environment Earth Observation System will be based on regional and national Spatial Data Infrastructures (SDIs) and should contribute to the delivery of a Shared Environmental Information System in Europe. The project should develop a collaboration framework between SDI initiatives in order to identify connectivity, interoperability and sharing obstacles and propose and develop innovative, user-friendly and economic solutions and tools to overcome them. The project will need as broad as possible participation of international and national initiatives for the development of environmental spatial data infrastructures, in particular to harmonise as much as possible European efforts through the INSPIRE, GMES and GEO initiatives, also taking into account where relevant GEO-related research activities under Theme 3. Information and Communication Technologies. **(Policy relevant topic)**

Funding scheme: collaborative project (large-scale integrating project)

Expected impact: *Validated European system for geo-spatial information in Europe contributing to the implementation of the INSPIRE directive and fully compatible with GEOSS.*

Area 6.4.1.2. Cross-cutting research activities relevant to GEO

ENV.2008.4.1.2.1. Monitoring and observing oxygen depletion throughout the different Earth system components

Model predictions indicate that global changes plus pollution could lead to a depletion of the oxygen in many Earth systems (IPCC report). Moreover, the increasing number of oxygen-starved "dead zones" in marine waters and eutrophicated freshwater reservoirs is becoming a serious issue (for example in the Black Sea, Dead Sea, etc.). These issues are highly relevant

to GEOSS objectives from ecosystem, water management, and climate points of view. The in-situ oxygen monitoring project will contribute to addressing the inadequacy of current observation capabilities for assessing oxygen depletion. In addition to filling gaps in measurement capabilities, the project will address the interoperability of observing systems, the standardisation of metadata for data sharing and advocate sharing of telecommunication infrastructure and know-how. The project should be implemented with reference to task WA-06-05 and potentially contribute to the GEO work plan 2007-2009 tasks EC-06-01, EC-06-07, CL-06-06.

Funding scheme: collaborative project (small or medium-scale focused research projects)

***Expected impact:** Improved capacity for monitoring and predicting oxygen depletion throughout the Earth system and evaluation of existing and future impacts on ecosystems. Contribution to understanding through the different Earth system components (terrestrial, marine, atmospheric) the fate of O₂ as an essential element until now neglected in the observing and monitoring programmes.*

Area 6.4.1.3. Earth Observation activities in emerging areas

ENV.2008.4.1.3.1. Developing Earth Observation for the monitoring and prediction of environmental impacts from energy resource extraction, transportation and/or exploitation

At a time when the demand of energy is growing significantly (in particular in growing economies) and also at the onset of major shifts in the use of energy sources, the project should help the development of a distributed system which would enable collection of and access to data relating to the effect of energy use on the environment and ecosystems. The project should build on existing information systems already available for the different sources of energy. The project should enable the creation of scenarios for the impact of energy use on the environment, relying on existing or currently developed models that quantify changes to freshwater systems, biosphere, ecosystems, atmospheric and oceanic composition, etc. It should contribute to developing the capacities to assess at global level the impact of the exploitation of Energy resources. Pilot phases dedicated to the testing of the observing systems should be launched to assess various impacts, inter alia the impact at global scale of pollutants that are released from energy production, exploitation and exploration with a strong emphasis on pollutants that are continuously cycling between the atmosphere and aquatic ecosystems. In the mid-term it should enable quantification of environmental costs of energy exploitation and contribute to the definition of energy strategies in an independent way. The project should contribute to the GEO work plan 2007-2009 tasks EN-07-02 (Energy Environment Impact Monitoring) and EN-07-03 (Energy Policy Planning).

Funding scheme: collaborative project (large-scale integrating project)

***Expected impact:** Contribution to strategy for future exploitation of energy resources taking into consideration their relative abundance, likely shifts in energy use and the impact of their utilisation on the environment and the ecosystems.*

Area 6.4.1.4. Developing capacity building activities in the domain of Earth observation in the new EU countries and in the developing countries

ENV.2008.4.1.4.1. Developing necessary research activities for capacity building relevant to Earth Observation and GEO in the Black Sea basin

The aim is to carry out research necessary for the regional observation infrastructure development in the new EU Member States and in candidate and associated countries, such as those involved in the Organisation of the Black Sea Economic Cooperation, especially those with poor observational coverage. The project should address not only the subjects related to data collection but also those related to data archiving, distribution and interpretation. The efforts should be oriented towards public awareness, by undertaking proper dissemination activities, especially by mobilising the necessary funds in order to improve the available capacity. The project will develop research capacities required for the creation and improvement of development tools in all the nine societal benefits areas of GEO. The project should contribute to the GEO work plan 2007-2009 task CB-07-01 (capacity building implementation) by developing national and regional capacities, including human, technical and institutional capabilities for coordinating, accessing, using and sharing environmental data, information and services. The initial implementation of the systems selected as test cases should be undertaken. **(Specific International Co-operation Action)**

Funding scheme: collaborative project (large-scale integrating project)

Expected impact: *Comprehensive review and gap analysis built on existing local, national and regional initiatives to achieve the goals of the GEOSS, using all the available data concerning the shared observation and products in an accessible, comparable and understandable manner. Effective collaboration among different stakeholders to successfully initiate activities to optimise the system. Improved education, training, research and communication.*

Sub-activity 6.4.2. Forecasting methods and assessment tools for sustainable development taking into account differing scales of observation

Indicative available budget: EUR 12 million

Rationale for 2008 work programme

The rationale for the topics is based on the choice to reduce drastically the number of topics, in order to allow a critical mass and several projects on each of them. One of the three areas (Tools for impact assessment) will not be open in 2008. The main objective of the topic on indicators (ENV.2008.4.2.2.1.) is to provide a new perspective on indicators, in order to complement and build on the current project portfolio and the topic in the WP2007. This year, we have chosen to open up a window of opportunity for Civil Society Organisations (CSO) to contribute to the development of indicators, by bringing in a different perspective, - complementary to those of more traditional research actors.

Regarding ENV.2008.4.2.3.1, the rationale has been to encourage an open reflection about how sustainable development goals can be pursued in the context of globalisation. It has the objective to advance discussion and research on long-term visionary concepts, as called for in the paragraph 18 of the renewed EU Sustainable Development Strategy.

The last topic results from the conclusions of an expert meeting, which was held to enhance the links between policy and research on sustainable development. The objective of the topic is to experiment a "knowledge brokerage" between policy-makers and researchers, as well as in between disciplines.

Area 6.4.2.1. Tools for impact assessment

Not open in 2008.

Area 6.4.2.2. Sustainable development indicators

ENV.2008.4.2.2.1. Engaging civil society in research on Sustainable Development indicators

This activity aims at inviting civil society organisations (CSOs) to contribute to the development and enhancement of sustainable development indicators, by providing new insights and perspectives. CSOs will, in partnership with RTD performers and statisticians, identify gaps, and develop proposals for amendment of existing indicators and/or development of alternative indicators. Focus will be on increasing the relevance and efficiency of indicators, for example by taking into account the visions, knowledge and interests of different stakeholders. The analysis could include issues such as the ecological footprint, thresholds of sustainability for the use of the different natural resource services (air, water, soil), qualitative indicators, forward-looking and cross-cutting indicators. Indicators on

good governance for sustainable development could also be considered, including those related to conflicts of interest and social dilemma. **(Policy relevant topic)**

Funding scheme: research for the benefit of specific groups – CSOs, or coordination and support actions

Expected impact: *The renewed Sustainable Development Strategy (SDS) calls for the development of indicators which are capable of capturing the full complexity of SD. Increasing involvement of civil society organisations in the design and use of SDIs will open up new perspectives and hence improve the contribution of indicators to the renewed SDS. In particular, the output is expected to bring out further opportunities to break the link between economic growth and environmental degradation, by providing relevant and robust indicators. Medium-term impact.*

Area 6.4.2.3. Interplay between social, economic and ecological systems

ENV.2008.4.2.3.1. Rethinking globalisation in the light of sustainable development

The global dimension of sustainable development challenges is well recognised. However, it is often perceived in terms of policy trade-offs and conflicting agendas both within and between actors in the North and South. This perception relies inter alia on zero-sum game approaches (f.e.x in the case of delocalisation, trade barriers, increasing inequalities and exhaustion of natural resources) or the prisoner's dilemma ("why adopt proactive policies if others don't follow?"). There is a need to move beyond the current patterns of concepts and rethink the right balance between competition and cooperation, between exchange and self-sustainability. Intellectual property rights, demography and the gender-dimension should also be taken into account. New visionary concepts need to be created to enhance the pursuit of sustainable development at a global scale, to respond to policies and international multilateral agreements in line with political commitments already made (Millennium Goals – Johannesburg) and innovative approaches are called for to ensure the coherence of integrated policy-making at EU level. Consequently, inter-disciplinary approaches are encouraged, including perspectives from for example the fields of philosophy, political science, sociology, economy, psychology, law, and environmental science.

Funding scheme: collaborative projects (small- or medium-scale focused research projects, Community contribution up to EUR 1 500 000)

Expected impact: *The renewed Sustainable Development Strategy calls for visionary concepts and affirms that efforts are needed to "make globalisation work for sustainable development". However, in practice it has proven difficult to fully integrate the sustainable development agenda within the internal and external policies of EU. The research under this topic is expected to take a broad and visionary look at the connections between globalisation and sustainable development, and to provide as an output indications and directions for increasing the ability to sustain integrated policy-making at all levels. Important long term contribution to the renewed SDS. Long term impact.*

ENV.2008.4.2.3.2. Enhancing connectivity between research and policy-making in sustainable development

Researchers and policy makers both recognise the large policy potential of research in the field of sustainable development, but the potential is not fully used. The common diagnosis is that this is caused by two types of gaps: between research and policy-making on the one hand, and between disciplines (notably natural sciences, quantitative social sciences, and interpretative and qualitative social sciences), on the other hand.

This topic calls for applying "knowledge brokerage" on a chosen issue. This issue should be connected to the decoupling challenge, i.e. *"the need to break the link between environmental degradation and economic growth"*, as expressed in the renewed Sustainable Development Strategy adopted by the European Council in June 2006. The chosen issue should be one for which there is a significant body of research, which could be synthesised and exploited in novel and innovative ways for policy development and organisational learning. However, it should also take into account the pilot dimension of the project, and hence its relatively small size. Of particular interest is work based on knowledge produced under the framework programmes, and related research projects. When identifying the cross-cutting issues and their policy links, specific care should be given to designing the project (content and consortium), in such a way that it bridges the gaps and enhances the connectivity between research and policy, and between disciplines. Due to the experimental nature of the project, and the importance of the learning process, the design should also include an in-built evaluation process that documents and critically analyses successes and difficulties with the chosen approach. **(Policy relevant topic)**

Funding scheme: coordination and support actions (coordinating type), collaborative projects (small- or medium-scale focused research projects, Community contribution up to EUR 1 500 000)

Expected impact: *In a meeting with Member States and Associated Countries in June 2007 on research for sustainable development, there was a wide consensus that research was underutilised in policy-making due to a lack of links between disciplines and between research and policy. The output of the topic is expected to experiment new modalities of linking research results to policy-making through "secondary exploitation" of existing research. This will increase the usability of research in SD policy-making. Medium to long-term impact.*

Activity 6.5. HORIZONTAL ACTIONS

Indicative available budget: EUR 2.5 million

Sub-activity 6.5.1. Dissemination and horizontal activities

ENV.2008.5.1.0.1. Development of a methodology to exploit the results and enhance impacts of EU environment research activities

The aim is to elaborate innovative strategies, practices, and products to communicate results and activities of EU environment research activities to different target audiences (policy makers, scientific stakeholders, general public, educational purposes, etc.). Particular emphasis is placed on the development of knowledge transfer, strategies, and tools involving close interactions with stakeholders and other users of science and technology. Products may include various types of support, such as written material, internet and audiovisual material, and dissemination actions (such as events and workshops). A case study is to be proposed in a cross-cutting topical area. The contractual obligations arising from the model grant agreement should be analysed in view of suggestions about deliverables that can help to reach the objectives of the Community.

Funding scheme: coordination and support actions (supporting type)

***Expected impact:** Improved visibility and uptake of environment S&T evidence in policy making and shaping of public opinion, and increased public awareness.*

ENV.2008.5.1.0.2. Research excellence and major infrastructure in Russia and potential for S&T co-operation with EU partners in the area of the environment

The aim of this topic is to identify the potential co-operation opportunities, the scientific excellence and major research infrastructure in Russia in all areas of the FP7 Theme "Environment". This task should be carried out in an open and transparent way; all relevant Russian institutes should be informed about FP7 and SP research environmental activities and their research interests should be clearly noted. Attention should be paid to all geographical parts of Russia with relevant research expertise, including regions outside Moscow and Saint Petersburg. The proposal should explain the proposed methodology to carry out the project. The final product should become publicly available on a website and be given broad publicity. Rules about publication of personal data should be fully respected. The activity should be carried out in close contact with the Russian National Contact Point Coordinator or with other relevant and acknowledged Russian research management structures. The participation or close association of a Russian partner(s) in the consortium is necessary. This requirement will be applied as an eligibility criteria.

Funding scheme: Coordination and support actions (Supporting type)

***Expected impact:** In light of the good S&T relations between the EU and Russia, this activity aims at helping EU consortia to identify potential partners in Russia which might consequently improve Russian participation in EU projects.*

Indicative Budget

Indicative budget for the Environment Theme for the 2008 Work Programme¹⁹

	2008 (in EUR million)
Call FP7-ENV-2008-1	212
Joint Call FP7-ENV-NMP-2008-2	5 *
Total	217
General activities (cf. Annex 4)	3.41
Other activities:	4.18
<ul style="list-style-type: none"> • Evaluations (2.58) • Programme impact assessment (0.30) • Support to the 2008 Activities of the GEO Secretariat) (0.60) • Support to the "Bridging the Gap" conference (0.20) • Communication & Information (0.50) 	
Estimated total budget allocation	224.60

The above call budgets are indicative. The final budgets awarded to these calls, following the evaluation of proposals, may vary by up to 10% of the total value of the calls.

* The total budget of the joint call FP7-ENV-NMP-2008-2 will be EUR 10 million of which the other EUR 5 million will be provided by Theme 4 Nanoscience, Nanotechnologies, Materials and New Production Technologies.

Summary of budget allocation to general activities for 2008 in EUR million (cf. Annex 4)

Cordis	0.42
Eureka/Research organisations	0.02
COST	1.82
ERA-NET	1.15
Total	3.41

¹⁹ Under the condition that the preliminary draft budget for 2008 is adopted without modifications by the budget authority

Summary of budget allocation in the work programme 2008

Sub-activity	Indicative budget WP2008 (in EUR million)
6.1.1 Pressures on Environment and Climate	42
6.1.2 Environment and Health	20
6.1.3 Natural Hazards	14
6.2.1 Conservation and Sustainable Management of Natural and Man-Made Resources and Biodiversity	30
6.2.2 Management of Marine Environments	20.50
6.3.1 Environmental Technologies	39*
6.3.2 Cultural Heritage	9
6.3.3 Technology assessment, Verification and Testing	7
6.4.1 Earth Observation	21
6.4.2 Sustainable Development	12
6.5.1 Dissemination and Horizontal Activities	2.50
Total	217

* This amount includes the joint call FP7-ENV-NMP-2008-2.

All budgetary figures given in the calls are indicative. The repartition of the sub-budgets awarded within the calls, following the evaluation of proposals, may vary by up to 10% of the total value of the calls.

III IMPLEMENTATION OF CALLS

- Call identifier: *FP7-ENV-2008-1*
- Date of publication²⁰: 30 November 2007
- Deadline²¹: 25 February 2008 at 17.00.00, Brussels local time
- **Indicative budget:** *EUR 212 million*²²

The budget for this call is indicative. The final total budget awarded to this call, following the evaluation of proposals, may vary by up to 10% of the total value of the call.

All budgetary figures given in this call are indicative. The repartition of the sub-budgets awarded within this call, following the evaluation of proposals, may vary by up to 10% of the total value of the call.

- Topics called:

ACTIVITY/ AREA	TOPICS CALLED	FUNDING SCHEMES
ACTIVITY 6.1. CLIMATE CHANGE, POLLUTION AND RISKS		
Sub-activity 6.1.1. Pressures on environment and climate (EUR 42 million)		
<i>1.1.1.</i>	<i>ENV.2008.1.1.1.1 Sea-Level Rise: Trends in contributions from continental ice, processes and links to climate change</i>	<i>Collaborative project (large-scale integrating project)</i>
<i>1.1.2.</i>	<i>ENV.2008.1.1.2.1 Climate-chemistry interactions in the stratosphere related to ozone depletion</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
<i>1.1.3.</i>	<i>ENV.2008.1.1.3.1 Impacts of climate variability, extreme events and increasing atmospheric greenhouse gas concentrations on terrestrial carbon storage, exchange flows and soil carbon dynamics</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
<i>1.1.4.</i>	<i>ENV.2008.1.1.4.1 New components in Earth System modelling for better climate projections</i>	<i>Collaborative project (large-scale integrating project)</i>
<i>1.1.5.</i>	<i>ENV.2008.1.1.5.1 Addressing deforestation in tropical areas: greenhouse gas emissions, socio-</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>

²⁰ The Director General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

²¹ At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months

²² Under the condition that the preliminary draft budget for 2008 is adopted without modifications by the budget authority

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	<i>economic drivers and impacts, and policy options for emissions reduction</i>	<i>(Specific International Cooperation Action)</i>
1.1.5.	<i>ENV.2008.1.1.5.2 Climate change impacts and Thresholds on Arctic Ocean systems</i>	<i>Collaborative project (large-scale integrating project)</i>
1.1.6.	<i>ENV.2008.1.1.6.1 Impacts of Himalayan glaciers retreat and monsoon pattern change on the water resources in Northern India, and adaptation strategies</i>	<i>Collaborative projects (small or medium-scale focused research projects) (Specific International Cooperation Action)</i>
1.1.6.	<i>ENV.2008.1.1.6.2 Implications and risks of novel options to limit climate change</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
1.1.6.	<i>ENV.2008.1.1.6.3 Multiple pathways analysis of emerging economies in a post-Kyoto regime</i>	<i>Coordination and support actions (supporting type)</i>
Sub-activity 6.1.2. Environment and Health (EUR 20 million)		
1.2.1.	<i>ENV.2008.1.2.1.1 Health impacts of exposure to radiofrequency fields in childhood and adolescence</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
1.2.1.	<i>ENV.2008.1.2.1.2 Comparison of health risks in populations in the Arctic and selected areas in Europe due to the spreading of contaminants resulting from climate change</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
1.2.1.	<i>ENV.2008.1.2.1.3 European research network on noise and health</i>	<i>Coordination and support actions (coordinating type)</i>
1.2.1.	<i>ENV.2008.1.2.1.4 New, improved and validated biomarkers to investigate long-term health impacts of exposure to environmental pollutants</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
1.2.1.	<i>ENV.2008.1.2.1.5 Quantification of changing surface UV radiation levels and its impact on human health</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
1.2.1.	<i>ENV.2008.1.2.1.6 Databases based on European cohort studies and their exploitation for advancement of knowledge of environment-health relationships</i>	<i>Coordination and support actions (coordinating type)</i>
1.2.2.	<i>Not open in 2008.</i>	
1.2.3.	<i>Not open in 2008.</i>	
Sub-activity 6.1.3. Natural hazards (EUR 14 million)		

1.3.1.	<i>ENV.2008.1.3.1.1 Development of a common methodology and tools to evaluate earthquake hazard in Europe</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
1.3.2.	<i>ENV.2008.1.3.2.1 Natural hazards: social perception, behaviour and responses to risks</i>	<i>Coordination and support actions (coordinating type)</i>
1.3.3.	<i>ENV.2008.1.3.3.1 Prediction of triggering and risk assessment for landslides</i>	<i>Collaborative project (large-scale integrating project)</i>
1.3.3.	<i>ENV.2008.1.3.3.2 Preparedness and risk management for flash floods including generation of sediment and associated debris flow</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
1.3.4.	<i>ENV.2008.1.3.4.1 Natural hazards in Europe: coordinated research strategy between European and national levels</i>	<i>Coordination and support actions (coordinating type)</i>
ACTIVITY/ AREA	TOPICS CALLED	FUNDING SCHEMES
ACTIVITY 6.2. SUSTAINABLE MANAGEMENT OF RESOURCES		
Sub-activity 6.2.1. Conservation and sustainable management of natural and man-made resources and biodiversity (EUR 30 million)		
2.1.1.	<i>Not open in 2008.</i>	
2.1.2.	<i>ENV.2008.2.1.2.1 Groundwater systems</i>	<i>Collaborative project (large-scale integrating project)</i>
2.1.2.	<i>ENV.2008.2.1.2.2 Clustering River Basins Twinning Initiatives and knowledge transfer</i>	<i>Coordination and support actions (coordinating type)</i>
2.1.2.	<i>ENV.2008.2.1.2.3. Assessing the ecological status of water bodies</i>	<i>Collaborative project (large-scale integrating project)</i>
2.1.3.	<i>ENV.2008.2.1.3.1 Assessment of methods to combat desertification</i>	<i>Coordination and support actions (supporting type)</i>
2.1.4.	<i>ENV.2008.2.1.4.1 Improving the capacity to protect and manage the biodiversity of continental waters</i>	<i>Collaborative project (large-scale integrating project)</i>
2.1.4.	<i>ENV.2008.2.1.4.2 Rehabilitation of data from biodiversity-related projects funded under previous framework programmes</i>	<i>Coordination and support actions (supporting type)</i>
2.1.4.	<i>ENV.2008.2.1.4.3 Increasing the integration of biodiversity research results into policy making</i>	<i>Coordination and support actions (supporting type)</i>
2.1.4.	<i>ENV.2008.2.1.4.4 Scale dependency of sustainable use of biodiversity</i>	<i>Collaborative project (large-scale integrating project)</i>
2.1.5.	<i>Not open in 2008.</i>	

2.1.6.	<i>ENV.2008.2.1.6.1 Development of adaptive forest management models</i>	<i>Collaborative project (large-scale integrating project)</i>
Sub-activity 6.2.2. Management of marine environments (EUR 20.5 million)		
2.2.1.	<i>ENV.2008.2.2.1.1 Monitoring and evaluation of Spatially Managed Areas (SMA)</i>	<i>Collaborative project (large-scale integrating project)</i>
2.2.1.	<i>ENV.2008.2.2.1.2 Deep-sea ecosystems</i>	<i>Collaborative project (large-scale integrating project)</i>
2.2.1.	<i>ENV.2008.2.2.1.3 Ecosystem approach to marine environment and resource</i>	<i>Collaborative project (large-scale integrating project)</i>

ACTIVITY/ AREA	TOPICS CALLED	FUNDING SCHEMES
ACTIVITY 6.3. ENVIRONMENTAL TECHNOLOGIES		
Sub-activity 6.3.1. Environmental technologies for observation, simulation, prevention, mitigation, adaptation, remediation and restoration of the natural and man-made environment (EUR 34 million)		
3.1.1.	<i>ENV.2008.3.1.1.1 Rehabilitation technologies for degraded water systems presenting quantity and quality problems</i>	<i>Collaborative project (large-scale integrating project)</i>
3.1.2.	<i>ENV.2008.3.1.2.1 Recovery of degraded soil resources</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
3.1.3.	<i>ENV.2008.3.1.3.1 Waste prevention: industrial networking and zero-waste entrepreneurship</i>	<i>Collaborative project (large-scale integrating project)</i>
3.1.3.	<i>ENV.2008.3.1.3.2 Technologies for high added value production from waste</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
3.1.4.	<i>ENV.2008.3.1.4.1 Substitution options for Brominated Flame Retardants (BFRs): a prototypical case for source control of Priority Pollutants in a Life Cycle Thinking perspective</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
3.1.5.	<i>ENV.2008.3.1.5.1 Innovative environmental technologies including design concepts and materials for the reduction of damage to the environment</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
3.1.6.	<i>ENV.2008.3.1.6.1 Development of automated sensing technologies for estuaries, coastal areas and seas</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
Sub-activity 6.3.2. Protection, conservation and enhancement of cultural heritage, including human habitat (EUR 9 million)		

3.2.1.	<i>ENV.2008.3.2.1.1 Development and application of methodologies, technologies, models and tools for damage assessment, monitoring and adaptation to climate change impacts (excluding extreme events)</i>	<i>Collaborative project (large-scale integrating project)</i>
3.2.1.	<i>ENV.2008.3.2.1.2 "EU cultural heritage identity card"</i>	<i>Coordination and support actions (coordinating type)</i>
3.2.2.	<i>ENV.2008.3.2.2.1 Framework conditions to enhance most promising prototypes</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
3.2.3.	<i>Not open in 2008.</i>	
3.2.4.	<i>Not open in 2008.</i>	
Sub-activity 6.3.3. Technology assessment, verification and testing (EUR 7 million)		
3.3.1.	<i>ENV.2008.3.3.1.1 Safety and risk assessment as the basis of risk-based management of chemicals and products in a global perspective and Alternative Testing Strategies</i>	<i>Coordination and support actions (coordinating type)</i>
3.3.2.	<i>ENV.2008.3.3.2.1 Sustainability assessment of technologies</i>	<i>Collaborative project (large-scale integrating project)</i>
3.3.3.	<i>ENV.2008.3.3.3.1 Harmonised approaches towards the development of international technology verification systems</i>	<i>Coordination and support actions (coordinating type)</i>

ACTIVITY/ AREA	TOPICS CALLED	FUNDING SCHEMES
ACTIVITY 6.4. EARTH OBSERVATION AND ASSESSMENT TOOLS FOR SUSTAINABLE DEVELOPMENT		
Sub-activity 6.4.1. Earth and ocean observation systems and monitoring methods for the environment and sustainable development (EUR 21 million)		
4.1.1.	<i>ENV.2008.4.1.1.1 European Environment Earth Observation system supporting INSPIRE and compatible with GEOSS (Global Earth Observation System of Systems)</i>	<i>Collaborative project (large-scale integrating project)</i>
4.1.2.	<i>ENV.2008.4.1.2.1 Monitoring and observing oxygen depletion throughout the different Earth system components</i>	<i>Collaborative project (small or medium-scale focused research project)</i>
4.1.3.	<i>ENV.2008.4.1.3.1 Developing Earth Observation for the monitoring and prediction of environmental impacts from</i>	<i>Collaborative project (large-scale integrating project)</i>

	<i>energy resource extraction, transportation and/or exploitation</i>	
4.1.4.	<i>ENV.2008.4.1.4.1 Developing necessary research activities for capacity building relevant to Earth Observation and GEO in the Black Sea basin</i>	<i>Collaborative projects (large-scale integrating project) (Specific International Cooperation Action)</i>

Sub-activity 6.4.2. Forecasting methods and assessment tools for sustainable development taking into account different scales of observation (EUR 12 million)		
4.2.1.	<i>Not open in 2008.</i>	
4.2.2.	<i>ENV.2008.4.2.2.1 Engaging civil society in research on Sustainable Development Indicators</i>	<i>Research for the benefit of specific groups or coordination and support actions (coordinating or supporting type)</i>
4.2.3.	<i>ENV.2008.4.2.3.1 Rethinking globalisation in the light of sustainable development</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
4.2.3.	<i>ENV.2008.4.2.3.2 Enhancing connectivity between research and policy-making in sustainable development</i>	<i>Coordination and support actions (coordinating type), collaborative projects (small- or medium-scale focused research projects)</i>

ACTIVITY/ AREA	TOPICS CALLED	FUNDING SCHEMES
ACTIVITY 6.5. HORIZONTAL ACTIONS		
Sub-activity 6.5.1. Dissemination and horizontal activities (EUR 2.5 million)		
	<i>ENV.2008.5.1.0.1 1 Development of a methodology to exploit the results and enhance impacts of EU environment research activities</i>	<i>Coordination and support actions (supporting type)</i>
	<i>ENV.2008.5.1.0.2 Research excellence and major infrastructure in Russia and potential for S&T cooperation with EU partners in the area of the environment</i>	<i>Coordination and support actions (supporting type)</i>

- Evaluation procedure:
 - A one-stage submission procedure will be followed.
 - Proposals may be evaluated remotely.
 - Reserve lists may be established for the sub-activities

- The evaluation criteria (including weights and thresholds) and sub-criteria together with the eligibility, selection and aware criteria for the different funding schemes are set out in annex 2 to this work programme. In the case of large-scale integrated collaborative projects, maximum one project will be retained per topic. In the case of small and medium-scale focused collaborative projects maximum two projects will be retained per topic, except for sub-activity 6.4.2 and except for topic ENV.2008.1.1.6.2 under the sub-activity 6.1.1. on which this limitation will not apply.
- Additional eligibility criteria:
 - For the topic ENV.2008.5.1.0.2, the participation of a Russian partner(s) in the consortium is an additional eligibility criterion.
 - The following budgetary thresholds are applied as eligibility criteria:
 - Collaborative projects:
For small or medium-scale focused research projects, the requested Community contribution shall not exceed EUR 3 500 000, with the exception of the following topics:
ENV.2008.1.1.6.2 (up to EUR 1 000 000)
ENV.2008.4.2.3.1 and ENV.2008.4.2.3.2. (up to EUR 1 500 000).
For large-scale integrating projects the requested Community contribution shall be from EUR 4 000 000 up to 7 000 000, with the exception of the following topics:
ENV.2008.1.1.1.1 (from EUR 4 000 000 up to 10 000 000)
ENV.2008.1.1.4.1 (from EUR 4 000 000 up to 8 000 000)
ENV.2008.1.1.5.2 (from EUR 4 000 000 up to 5 000 000)
ENV.2008.2.2.1.2 (from EUR 4 000 000 up to 8 000 000)
ENV.2008.3.2.1.1 (from EUR 4 000 000 up to 5 000 000)
ENV.2008.3.3.2.1 (from EUR 4 000 000 up to 5 000 000)
 - CSA, the "coordination and support actions" funding scheme, allows for 2 different types of actions to be financed: a) coordinating type or b) supporting type. The requested Community contribution for these coordination or support actions is expected to be relatively limited in size and scope, as reflected in the relevant topic descriptions. The requested Community contribution shall not exceed EUR 1 000 000
 - For "Research for the benefit of specific groups"²³ the requested Community contribution shall not exceed EUR 1 500 000.
- Indicative evaluation and contractual timetable:
Evaluations are expected to be carried out during the months of March-April 2008. It is expected that the contract negotiations for the shortlisted proposals will be opened in June 2008.
- Consortia agreements:
Participants in collaborative projects (large-scale integrating projects) are required to conclude consortium agreements.
- The forms of grants and maximum reimbursement rates which will be offered are specified in Annex 3 to the Cooperation work programme.

²³ Topic ENV.2008.4.2.2.1 in this Work Programme

- Particular requirements for participation, evaluation and implementation:
The minimum number of participating legal entities for all funding schemes is set out in the Rules for Participation and presented in the relevant parts below.

Funding scheme	Minimum conditions
Collaborative projects	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Collaborative project for specific cooperation actions (SICA) dedicated to international cooperation partner countries	At least 4 independent legal entities. Of these, 2 must be established in different MS or AC. The other 2 must be established in different international cooperation partner countries (ICPC).
Coordination and support actions (coordinating type)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and support actions (supporting type)	At least 1 independent legal entity.
Research for the benefit of specific groups	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC. At least 1 of the legal entities has to be a civil society organisation (CSO).

- Call identifier: *FP7-ENV-NMP-2008-2*
- Date of publication²⁴: 30 November 2007
- Deadline²⁵: 25 February 2008 at 17.00.00, Brussels local time
- **Total budget:** EUR 10 million ²⁶, of which EUR 5 million comes from Theme 6. Environment (including Climate Change) and EUR 5 million from Theme 4. Nanosciences, Nanotechnologies, Materials and new Production Technologies.

All budgetary figures given in this call are indicative. The final total budget awarded to this call, following the evaluation of proposals, may vary by up to 10% of the total value of the call.

- Topic called:

THEME/ ACTIVITY	TOPIC IDENTIFIER	FUNDING SCHEME
6. ENVIRONMENT (including Climate Change)		
ACTIVITY 6.3. ENVIRONMENTAL TECHNOLOGIES		
	<i>ENV.2008.3.1.1.2 Nanotechnologies for water treatment</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>
4. NANOSCIENCES, NANOTECHNOLOGIES, MATERIALS AND NEW PRODUCTION TECHNOLOGIES		
ACTIVITY 4.1. NANOSCIENCES AND NANOTECHNOLOGIES		
	<i>NMP-2008-4.1.2-2 Nanotechnologies for water treatment</i>	<i>Collaborative projects (small or medium-scale focused research projects)</i>

This action is implemented jointly with Theme 4. Nanosciences, Nanotechnologies, Materials and New Production Technologies; applicants must submit a proposal either to the topic ENV.2008.3.1.1.2 or to the topic NMP-2008-4.1.2-2, **but not to both**.

- Evaluation procedure:
 - A one-stage submission procedure will be followed.
 - Proposals may be evaluated remotely.
 - The evaluation criteria (including thresholds) and sub-criteria together with the eligibility, selection and award criteria for the different funding schemes are set out in annex 2 to this work programme

²⁴ The Director General responsible for the call may publish it up to one month prior to or after the envisaged date of publication

²⁵ At the time of the publication of the call, the Director-General responsible may delay this deadline by up to two months

²⁶ Under the condition that the preliminary draft budget for 2008 is adopted without modifications by the budget authority

- An additional eligibility criterion is the budgetary threshold. Under this topic, the project requested Community contribution shall not exceed **EUR 2 500 000**.
- Indicative evaluation and contractual timetable:
Evaluations are expected to be carried out during the months of March-April 2008. It is expected that the contract negotiations for the shortlisted proposals will be opened in June 2008.
- Consortia agreements:
Participants are required to conclude a consortium agreement.
- The forms of grants and maximum reimbursement rates which will be offered are specified in Annex 3 to the Cooperation work programme.
- Particular requirements for participation, evaluation and implementation:
The minimum number of participating legal entities for this funding scheme is set out in the Rules for Participation.

Funding scheme	Minimum conditions
Collaborative projects (small or medium-scale focused research projects)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC

IV FUTURE DIRECTIONS OF THE WORK PROGRAMME

The future years' work programmes of the Environment Theme foresee to address the following subjects under each activity in relation to the relevant part of the Cooperation Specific Programme. The future work programmes will be implemented through a balanced combination of the array of implementation schemes foreseen by FP7, including the cooperative research, the ERA-Net and ERA-Net plus, the Art. 169 and the SICA.

Activity 6.1 Climate change, pollution and risks

Future work under the sub-activity '*Pressures on Environment and Climate*' will promote integrated climate research. It will emphasise worldwide adaptation options, impacts of climate change to ecosystems, economy sectors and society, paleo-environmental analyses to understand climate variability, carbon cycle and greenhouse gases, climate-chemistry interactions, impacts of climate change and extreme events on water resources in Europe, and process-oriented evaluation of earth system modelling. A coordinated call on climate change and energy is foreseen.

Future work under the '*Environment and Health*' sub-activity will focus on: various health effects resulting from climate change, water issues and chemicals, epidemiological approaches for the investigation of health effects of environmental exposures, and research to improve exposure modelling and health risk assessment.

Future work under the '*Natural Hazards*' sub-activity will emphasise: the development of focused vulnerability approaches essential to assess and better quantify the risk; drought and forest fires; study multi-risk and cascading effects and mitigation in an integrated manner; scenarios for flood management; socioeconomic benefits of hazard and disaster prevention. A coordinated call on seismic engineering research is foreseen.

Activity 6.2 Sustainable management of resources

Future work will focus on the development of models and tools for the protection and the management of ecosystems and natural resources in a changing environment. Essential resources such as water, soils and biodiversity will be addressed, as well as the main ecosystem types. There should be a balanced and integrated effort between furthering knowledge, determining the conditions and thresholds for use of natural resources, and developing management tools and approaches. Actions to generate reliable data to stakeholders will be further promoted.

Support will also be provided to innovative approaches to further understand and assess threats to ecosystems, such as desertification, biological invasions and toxic algal blooms and the changes that could be triggered by socio-economic changes, e.g. changes in the energy supply and consumption systems, changes in the urban development patterns. Coordinated calls could be envisaged on biofuels and marine and maritime research. The international dimension will be strengthened in areas of mutual benefit, e.g. marine and soil research and research on global threats.

Activity 6.3 Environmental technologies

Continuing along the line of characterising every yearly work programme for Environmental Technologies with an overarching goal, the subject of "Coping with extreme events and major risks" is foreseen to be addressed in the work programme 2009, while in the following work programmes other subjects for which the development of advanced Environmental Technologies is needed will be proposed, like (not in chronological order) "Urban areas", "Nature, the rural environment and landscapes", "Oceans, regional seas and coastal zones", "The atmosphere" and specific industrial sectors of major interest for Europe and for our objectives of International Cooperation.

Activity 6.4 Earth observation and assessment tools for sustainable development

To strengthen the contribution to GEO it is foreseen to focus on the following activities: to make available the necessary observation systems to anticipate global change events and the impact of energy exploitation and exploration; to support emerging areas in the domain of Earth Observation which are for the time being subject to evaluation (e.g. Environment and Health, Optimising/ disseminating the use of scientific observations of the environment, taking into account the socio-economic context); to develop Earth Observation systems needed for a better understanding of meteorological and seismogenic hazards; and to structure the European approach in the domain of Earth Observation.

Future work in the assessment tools for sustainable development will address the issues related to "greening the economy". These activities will be prepared in line with the results of the consultation launched by the Green Book on economic instruments and fiscal reform. They will also intensify the social science approaches (sociology, political science, philosophy, psychology, experimental economics). In addition, within this sub-activity focus will be on subjects related to impact assessment tools which were not covered in the previous call. These issues will be developed to take a structural approach to impact assessment, also taking into account the results of the current project portfolio.

Activity 6.5 Horizontal actions

Activities will be designed in order to help making strategic research partnerships with third countries and implement existing S/T agreements. These activities will aim at reinforcing the international component of the various activities described above. They will also address specific problems that third countries are facing or that have a global character. In addition, subjects that address environmental issues of a cross-thematic character and of high political importance (such as environmental security) will be included. Furthermore, additional work is envisaged for promoting better communication strategies and innovative ideas for the dissemination of research results.