

Convocatoria NMP 2010

**NMP.2010.3.1-1 New industrial models for a sustainable and efficient production**

**Technical content/scope:** The main objective is to develop holistic industrial models and concepts for new sustainable and more performing design and production systems/networks for new product/services, which are responsive to market and business changes. The new models must be tailored to innovative value propositions, conceived as solutions to unexpected and unexpressed needs to enable the creation of additional market potential. Moreover, they should take into consideration the economic factors which have an essential influence on the sustainability of a product/service, its production processes/systems/networks and its end-of-life recovery and recycling. In a volatile and rapidly changing global market, it is crucial to develop business models that dynamically integrate company economics taking into consideration local resources, such as commodities, energy, labour, etc. Such global governance models will enable European companies to offer their customers a broader choice of affordable sustainable and efficient products and processes with extended ranges of services.

The research should focus on:

- Development of new tools for analysing, modelling and matching the product's perceived quality features and customer usage modalities throughout the product life-cycle, to enable a sustainable approach to design of products tailored to customer needs;
- Development of new methodologies for intelligent product/process design, e.g. based on embedded devices, allowing innovative operation, use and service models; such kind of

products/service solutions should also improve the product sustainability by extending their life and by reducing their use of resources and the impact on the environment;

- Development and optimisation of production networks to address the dynamic challenges facing design of products/services, new processes and production systems/networks throughout a product life cycle.

Cooperation with IMS<sup>5</sup> regions regarding economic and environmental aspects is foreseen, as appropriate.

**Funding Scheme:** Small or medium-scale focused research projects.

**Expected Impact:** A step-change in the performance of European industry, and in particular SMEs, can be achieved and can be characterised by a higher reactivity to customer needs by at least 20% in terms of real time economics and legislation monitoring and inclusion. Moreover extended product utilisation by at least 20 % through value-adding services is to be expected. A more economically and ecologically compatible products/services design and production systems/networks should also allow a more efficient use of material resources, via concurrent commodity management.

## Convocatoria PPP Energy Efficiency Buildings

### **EeB.NMP.2010-1                      New nanotechnology-based high performance insulation systems for energy efficiency**

**Technical content/scope:** Insulating materials are used to keep the temperature constant in an enclosed space such as a house, either warmer or colder than the surroundings, and in doing so can protect the environment through the reduction of greenhouse gases. Nanotechnology offers high potential for enhanced insulation allowing thinner coatings or fillings to prevent heat loss or gain which would not be possible with conventional materials. The research shall focus on development of nanotechnology based insulation systems for enhanced thermal and improved mechanical properties while reducing overall costs making wide-scale commercial application feasible, including the renovation of existing installations. Examples of materials systems for achieving this are aerogels/aerogel composites and nanofoams or thin nanostructured insulators based on thermally resistant (composite) nanoparticles, which can be applied directly to a surface as a film, spray or paint. A further research objective is to combine the insulating effect with other functionalities, for example with photochromic, thermochromic, electrochromic for windows or flame retardant effects, self-cleaning, biocide or humidity control properties, for walls and roofs. The safety of proposed solution(s) must be ensured for the full product life cycle (production, use, disposal/recycling). Economic performance of the proposed solutions should be demonstrated by service-life costing analysis.

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.

The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be reflected in the evaluation.

**Funding Scheme:** Collaborative projects

**Expected impact:** (i) Reduce the cost of nanotechnology-based insulation systems and make their wide-scale commercial application feasible (ii) reduce the heat losses and gains through the building envelope for reduced energy consumption and increased indoor comfort; (iii) for windows which are the weakest part on the energy efficiency performance, a reduction in the U/value by more than 35% is expected compared with conventional ones. For glass covered building it would reduce the energy bill for heating by 40% and for cooling by 7%.

### **EeB.NMP.2010-2                      New technologies for energy efficiency at district level**

**Technical content / scope:** The construction sector can provide a significant contribution to the reduction of resources consumption and to a wider use of renewable resources. The main objective of the topic is to develop new technologies and methods to help reduce the energy consumption and environmental impact of buildings during their entire life-cycle (80% of energy consumption occurs during service-life) at district level, since this cannot be achieved only at building level.

The main focus is on new concepts, technologies, design tools and business models at district level for "intelligent buildings", able to significantly reduce or even completely meet their own energy consumption; improvement of the building energy performance (through cladding and ventilation technologies, sensors, actuators and pervasive computing systems, utilisation of embedded

renewable energy sources, etc.). Developments are also required at district level addressing new and improved materials and structures to improve the indoor environment as well as resource and climate, energy consumption conversion, storage capacities and energy carriers. Deliverables include the development, integration and demonstration, if possible at district level, of decision support systems and assessment tools of the above concepts e.g. for social housing, residential buildings, offices, and public buildings such as hospitals, schools and universities, railway- and underground-stations and airports.

In order to ensure industrial relevance and impact of the research efforts, the active participation of industrial partners, including SMEs, represents an added value to the activities and this will be reflected in the evaluation.

The projects are expected to cover demonstration activities, including pilot implementations in industrial settings, and this will be reflected in the evaluation.

**Funding scheme:** Collaborative projects.

**Expected impact:** The new technologies should contribute to a reduction of 50% in energy consumption compared to the 2005 values. The benefits for applying the new technologies at district level are expected to represent a significant reduction (around 20%) of the total costs compared to existing solutions. The return on investment for these additional costs should be preferably not more than 7 years, both in the case of new construction and retrofitting.

## Convocatoria PPP Green Cars 2010

<b>GC.NMP.2010-1, GC.ENERGY.2010.10.2-2, GC.ENV.2010.3.1.3-3, GC.SST.2010.7-9</b>	<b>Materials, technologies and processes for sustainable automotive electrochemical storage applications</b>
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**Contents/scope:** Research projects are called for, addressing innovative materials and technologies for battery components, material architectures and systems for automotive electrochemical storage within a responsible, sustainable and environmental-friendly approach looking at the entire life cycle.

Projects for batteries and/or electrochemical capacitors are eligible. For batteries, research should focus on innovative developments for lithium-based energy storage technologies improving on safety and energy density. Alternatively, projects can be looking at completely different technologies, architectures and chemistries, such as open cells for higher energy densities.

For existing or near-to-market types of lithium-based batteries, projects dealing with the recycling, recovering and re-use of materials are eligible, as well as projects on the comprehension, modelling

and management of degradation drivers and processes with the aim to extend the calendar and operational life of the cells.

The environmental sustainability of each developed solution shall be assessed via life cycle assessment studies carried out according to the International Reference Life Cycle Data System (ILCD) Handbook<sup>10</sup>.

Cost, recyclability and safety issues should be prominently emphasized in all projects, as well as proof of concept in terms of product and/or process (not necessarily reaching the industrial scale but convincingly proving scalability towards industrial needs), thereby exploring their standardisation potential. The effect of bidirectional flow at charge stations should be taken in due account, as well as the potential for fast charging (at least 5C) without significant life reduction.

Participation from the manufacturing industrial sector is requested in each project. Aspects like characterisation, standardisation and synergies with other applications, availability of concerned materials, eco-design, manufacturing, can be covered.

At the same level of quality resulting from the evaluation by independent experts, priority for funding should be given to proposals that allow covering this topic as completely as possible.

Work on fuel cells is excluded since it is already covered in the related JTI, but synergies of storage chemistries and architectures with fuel cell vehicle applications showing performance beyond the call targets, can be covered.

**Funding Scheme:** Collaborative projects

**Expected impact:** Establishing the basis for a world level European automotive battery and electrochemical capacitors industry, with significant contributions to lead the market in the area of recycling<sup>11</sup>. Fostering the constitution of interdisciplinary consortia. The expected impact has to be credibly motivated in terms of performance, cost, recyclability and life-cycle sustainability. Quantitative targets for lithium-based energy storage technologies include cost reduction down to a system level target value<sup>12</sup> of maximum 150€/kWh for mass production and improvement of safety and energy density up to at least 200 Wh/kg. For electrochemical capacitors the corresponding targets are respectively a cost reduction down to maximum of 10€/kW and a specific power of at least 25 kW/kg, with an energy density of at least 10 Wh/kg. Advanced chemistries should target energy densities of at least 300 Wh/kg.

**ENV.2010.3.1.3-1 Innovative technologies and eco design recommendations for reuse and recycling of Construction and Demolition (C&D) waste, with a special focus on technologies for onsite solutions**

The aim is to develop and promote innovative technologies and system solutions for high grade construction materials manufactured from high-volume C&D waste. Onsite processing and/or reuse will be a plus. The economic and environmental efficiency of the proposed approach should be practically demonstrated in a representative number of on-site case-studies of significant size geared to draw maximum benefits from the early-stage cooperation of clients, designers, construction engineering companies and demolition/waste processing enterprises in the course of construction projects. Thus, proposals should convincingly address the technological and long term safety/durability aspects of the solutions to be applied, their economic analysis, a thorough analysis of environmental impact and external cost reductions as well as an elaboration of resulting eco-design recommendations for easy dismantling and material reuse, applicable in new construction undertakings. Significant participation of industrial partners, and especially of SMEs, is required and it will be considered in the evaluation.

**Funding scheme: Collaborative Project (small or medium-scale focused research project)**

*Expected impact: Increase of the recycling/reuse rate of high-volume C&D waste streams. Policy recommendations at European, national and local level.*

**ENV.2010.3.1.4-1 Integrated Pollution Prevention and Control of industrial emissions in the Mediterranean region**

Industrial activities contribute significantly to the pollution of the Mediterranean basin. The aim of this research is to assess the possibility and the impact of diffusing the EU Integrated Pollution Prevention and Control approach to other Mediterranean partner countries in order to ensure a higher level of environmental protection.

This coordination action will have the following objectives/steps:

- (1) Assessment of the scope for preventive and abatement technologies based on best available techniques in key industrial sectors with significant local or regional negative impacts on human health and the environment in the Mediterranean region. The most promising industry sectors with the highest environmental benefit potential will be identified for further study.
- (2) Adaptation of the relevant information of the European Best Available (BAT) reference documents, to document and support the implementation of the techniques and sectors previously identified, taking particular account of the regional and local conditions to guarantee the effective prevention and reduction of industrial emissions.
- (3) Production of communication material to disseminate information on those techniques among public authorities and industrial operators.

This action addresses Mediterranean partner countries.

**Funding Scheme: Coordination and Support Action (coordinating action)**

**Additional eligibility criterion: A minimum of two participants from the Mediterranean partner countries is required. This requirement will be applied as eligibility criterion.**

*Expected impact: This project will prepare the ground for the implementation of BAT techniques to respond to particular health and environmental impacts from industrial emissions in the Mediterranean region with the objective to reduce the "pollution leakage" due to the displacement of polluting industries.*

#### **ENV.2010.4.2.1-1 Enhancing model integration for the assessment of global environmental change**

European scientists have been in the forefront of integrated assessment to establish sound insights on problems with an impact on different socio-economic and environmental systems. This included the development and application of shared modelling interfaces that supports two-way links and smooth data exchange, thus enabling to use those models that are best suited to a particular issue. This topic calls for an improved integration of and/or interconnectivity between different models used for global or sub-global assessments of environmental change and related policies. Transparency of the integration modes and methodologies should be ensured and public access to allow for linking up of further models is strongly encouraged. The research should build on previous experience but with a clear focus on new areas linked to the sustainable development challenges. In this context interaction with policy makers will be sought to ensure policy relevance of the results to be achieved through this enhanced integration.

**Funding scheme: Collaborative Project (small- or medium-scale focused research project)**

*Expected impact: Improved linkage between models. Improved capacity of policy makers to define options for sustainable policy interventions.*

#### **ENV.2010.4.2.3-1 Foresight to enhance behavioural and societal changes enabling the transition towards sustainable paths in Europe**

The topic is calling for bottom-up approaches addressing the question of how to overcome the gap between awareness of the issues at stake and the concrete engagement in sustainability-driven action, as individuals and as a society. As a first step, the project shall conduct an analysis of barriers and drivers for engaging on a sustainable, low-carbon paths, individually (taking into account the diversity of lifestyles), on the level of individual organisations, and collectively (organisation of the society and the economy). Attention should be paid to the interaction between structural factors, such as social institutions, and agent-based factors, such as incentives and vested interests. In particular, the roles of actors on different levels shall be analysed (policy-makers, opinion-makers, business, civil society), with an emphasis on linking initiatives, and finding potential agents for change.

The results of the analysis shall then be used as a background for scenario development and a back-casting exercise in order to identify potential paths to engaging on an integrated effort to support the transition to a sustainable Europe. The exercise shall address issues such as how to engage individuals and collectives on sustainable paths; what is needed in order to address the barriers and make the most of the drivers for sustainable development in terms of a) new policy-

mixes and b) new and innovative mechanisms for cooperation and partnerships between actors in public, private sector and the civil society.

**Funding scheme: Collaborative project (small or medium-scale focused research project) or research for the benefit of specific groups – civil society organisations. Requested Community contribution of up to EUR 1 500 000. Bottom-up topic, up to three projects will be retained for this topic.**

*Expected impact: Better understanding of what it takes to transform the challenge of sustainable development into practice in Europe, and increased ability to develop responses on the ways in which individuals and organisations can advance towards sustainability.*

### **ENV.2010.4.2.3-2 Producing a shared vision on how to harness R&D to sustainability**

Through this coordinated action, national research policy makers from Member States and Associated Countries are invited to exchange views and develop a shared vision on how best to harness R&D to sustainable development. This requires an analysis of the ways by which research systems (i.e. organisations, programmes and policies) are responsive to sustainability requirements, and how this can be monitored and increased. For this purpose, it is expected to organise a joint informed dialogue between R&D policy makers, with the scientific support of sustainable development sciences. This coordinated action should build on the results of the preliminary exercise entitled "Research for Sustainable Development" (R&D4SD), and its ensuing Report<sup>29</sup>. It should produce mutual understanding of the different approaches, support learning processes, and develop common actions, where relevant.

**Funding scheme: Coordination and support action (coordinating action). Up to one project will be retained for this topic.**

*Expected impact: Contribute to the realisation of the ERA Vision, for which the European Research Area should be responsive to its needs and ambitions in pursuit of sustainable development<sup>30</sup>, and provide recommendations for ensuring that FP8 also contributes to this end.*

### **ENV.2010.4.2.3-3 Brokerage activities to promote sustainable consumption and production patterns**

The aim of this activity is to experiment and develop new integrative modalities of linking research results to policy-making through 'secondary exploitation' of existing research. The topic calls for applying "knowledge brokerage" between scientists and policy makers on policy issues related to sustainable consumption and production, such as promoting sustainable consumption patterns, developing sustainable tourism, managing potential economic, political and social contradictions between economic growth re-launch and sustainable consumption. This policy issue should be clearly and convincingly presented in the proposal. The chosen issue should be one for which there is a significant body of research, which could be exploited in novel and innovative ways in cooperation between researchers, potentially including those of CSOs, and policy makers. This "research reservoir" shall be made explicit in the proposal. To ensure the uptake of project results, the consortium shall necessarily include policy makers and/or the work

plan shall be designed so as to guarantee their active involvement, ideally on an equal basis with the researchers. 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.

**Funding scheme: Collaborative Project (small- or medium-scale focused research project). Requested Community contribution of up to EUR 1 500 000. Bottom-up topic, up to three projects will be retained for this topic.**

*Expected impact: Increased use of research in Sustainable Development policy-making, in line with one of the policy guiding principles of the renewed EU SDS, i.e. the use of best available knowledge. Short to medium-term impact.*

**EeB.ENV.2010.3.2.4-1 Compatible solutions for improving the energy efficiency of historic buildings in urban areas<sup>23</sup>**

The objective is to develop new technologies and systems as well as compatible materials for improved energy efficiency of historic buildings while ensuring their sustainable protection and integration in urban areas. Proposals will target rehabilitation or adaptation of historic buildings to make them highly resource and energy efficient by improving architectural components, thermal insulation, air conditioning and ventilation, heating, lighting, and other appropriate solutions. Developments should also promote innovative methods and materials for the monitoring and control of energy consumption and of indoor climate including air pollution and possibly be applicable to cultural heritage collections located in historic buildings. Solutions for the rehabilitation and/or retrofitting of historic buildings must respect the integrity, authenticity and compatibility between the old and new materials and techniques, and be economically viable to enable a widespread application to a vast majority of urban historic buildings, whether they are or not protected by legislation. Protocols and tools for the planning and implementation of heritage rehabilitation works should be adapted to consider the specific cultural value and priorities required of heritage building interventions and to ensure their effective transferability to other historic buildings located in other urban centres or their surroundings across Europe.

A significant participation of industrial partners including SMEs is required. The participation of local authorities or agencies in charge of the rehabilitation and adaptation of ancient and historic buildings in rehabilitated urban areas is encouraged. This will be considered in the evaluation.

**Funding scheme: Collaborative Project (large scale integrating project, upper financial contribution EUR 5 000 000)<sup>24</sup>**

*Expected impact: Proposals should contribute to the European Economic Recovery Plan and lead to widespread improvement of energy saving in historic buildings, sustainable renovation of ancient infrastructure and improved living conditions within historic urban areas. Research should contribute to improved quality management of historic cities and cultural tourism, and also help implement the EU Environmental Impact Assessment Directives when applied to historic buildings<sup>25</sup>. Proposals should contribute to the EU Energy Performance of Buildings and other relevant policy regulations. Proposals will also support the Strategic Research Agenda of the European Construction Technology Platform and its Focus Area in Cultural heritage.*

**Topic ENERGY.2010.8.1-1: Valorisation of low temperature heat**

*Contents/scope:* Innovative systems, methods and/or equipment for use of low temperature heat (<120°C) for power generation and/or cooling. The whole cycle from heat production to cooling or power delivery should be addressed and a wide range of applications should be considered, including industrial and residential applications. Several types of heat sources should be considered ranging from CHP plants to industrial waste heat. New concepts, technologies, equipment and materials should be developed.

**Funding scheme:** Collaborative Project

*Expected impact:* Better and more efficient use of low temperature heat, available from various sources such as industrial processes, CHP-plants and even households would lead potentially to large energy savings. The projects are expected to bring forward new technologies and concepts with large European-wide applicability.

*Open in call:* FP7-ENERGY-2010-1

**Topic EeB.ENERGY.2010.8.1-2: Demonstration of Energy Efficiency through Retrofitting of Buildings**

*Content/scope:*

Demonstrate in the building sector, high energy efficient innovative **retrofitting** technologies and measures for low energy performing buildings, the typology of which is representative for large geographical areas in Europe.

The project(s) shall use innovation in technology, design, planning, operation or systems integration with a strong preference for residential buildings and address socio economic issues.

While the project(s) could contain a single building or a number of buildings, located in one or more countries, effort and budget should be balanced amongst participants from at least three Member States/Associated Countries.

Retrofitting should be as cost effective as possible. The return to investment for the energy saving measures should be calculated and presented and should be reasonable under current market standards.

Detailed information should be provided on the building(s) existing envelope and its current energy use and the energy efficiency measures to be applied should also be described extensively. The gross floor area of the building(s) should be specified together with the targeted annual energy use per m<sup>2</sup> (kWh/m<sup>2</sup>/year, broken down by space heating, cooling, domestic hot water heating, lighting, etc)

In addition to the technical measures to be undertaken, additional accompanying measures affecting the future operation of the building (e.g. behavioural changes, post occupancy evaluation) should also be clearly addressed.

The energy use should achieve at least the national limit values for new buildings according to the applicable legislation based on the Energy Performance of Buildings Directive (for 2010).

A holistic approach is expected in the measures to be taken and all elements and systems of the building that could contribute to its becoming more energy efficient should be envisaged. The space heat use (kWh/m<sup>2</sup>/year) should be reduced by about 75%.

The project(s) should have a high potential of replication contributing to large scale market deployment before 2020; a dissemination and market deployment programme should be included in the proposal. The detailed metering/monitoring programme should last at least for one year, however, longer term commitment and programmes of the building operators (e.g. in continuous monitoring and/or guarantees of performance to the tenants) would give an added value to the proposal.

**Funding scheme:** Collaborative Project.

**Expected impact:**

- Large scale market deployment in retrofitting of buildings before 2020
- Accelerate the retrofitting uptake of low efficient building stock.
- Offer cost effective highly energy efficient retrofitting practices.
- Accelerate the market uptake of the most innovative ICT tools for efficient buildings management
- Create best practice examples for the construction sector based on innovation and competitiveness, with benefits for the citizens and the environment.
- Contribute to raise the performance standards and regulations on European, national and local level, in the construction industry and building sector, through the best practice examples.

**Additional information:**

- In addition to the detailed description of the buildings and the measures to be taken, it is strongly suggested for participants to complete and include in the proposals the Building Energy Specification Tables (BEST) summarising this information for every type of building proposed. The template for the BEST table can be downloaded from the following web address:  
[ftp://ftp.cordis.europa.eu/pub/fp7/docs/wp/cooperation/energy/e\\_best\\_2010\\_en.xls](ftp://ftp.cordis.europa.eu/pub/fp7/docs/wp/cooperation/energy/e_best_2010_en.xls)
- Successful proposals will be asked to follow a common monitoring data structure, using a common methodology, in order to feed the relevant Commission data bases (e.g. CONCERTO data base).
- The form of grant applied in area 8.1.2. 'Energy efficiency in Buildings' is based on additional energy efficiency measures in buildings. The grant will be composed of a combination of:
  - the typical reimbursement of eligible costs, and
  - flat rate financing determined on the basis of scale of unit costs only for the demonstration part of the buildings.

- The scale of unit cost of Community financial contribution is fixed to EUR 100 /m<sup>2</sup> eligible costs and thus EUR 50 /m<sup>2</sup> Community contribution.
  - The eligible cost per building used in the projects are fixed costs.
  - The total of Community financial contribution based on scale of unit costs may not exceed EUR 6 million for one demonstration site.
  - The evaluation of the proposals will also take into account the degree of excellence and innovation of the technology used and the most cost effective practices (euros/efficiency gain; euros/CO<sub>2</sub> reduction, kWh/m<sup>2</sup>/year saved). For this reason, the above figures should be indicated in the proposal.
  - Up to four (4) projects will be supported.
- ***Open in call:*** FP7-2010-NMP-ENV-ENERGY-ICT-EeB