COST Action MP1106 – 1st Annual Workshop – Dublin, 13-14 September 2012

Smart & Green Interfaces:

From Single Bubbles/Drops to Industrial/Environmental/Biomedical Applications

ROUND TABLE ORGANIZATION

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Round Table objectives

- ✓ **Setting up consortia among the partners for application to FP7 open calls for proposals related to smart and green interfaces**

- ✓ Foster collaborations among partners (role of WGs leaders)
- ✓ Identification of missing expertise within the action

Suggested approach

Role of moderators

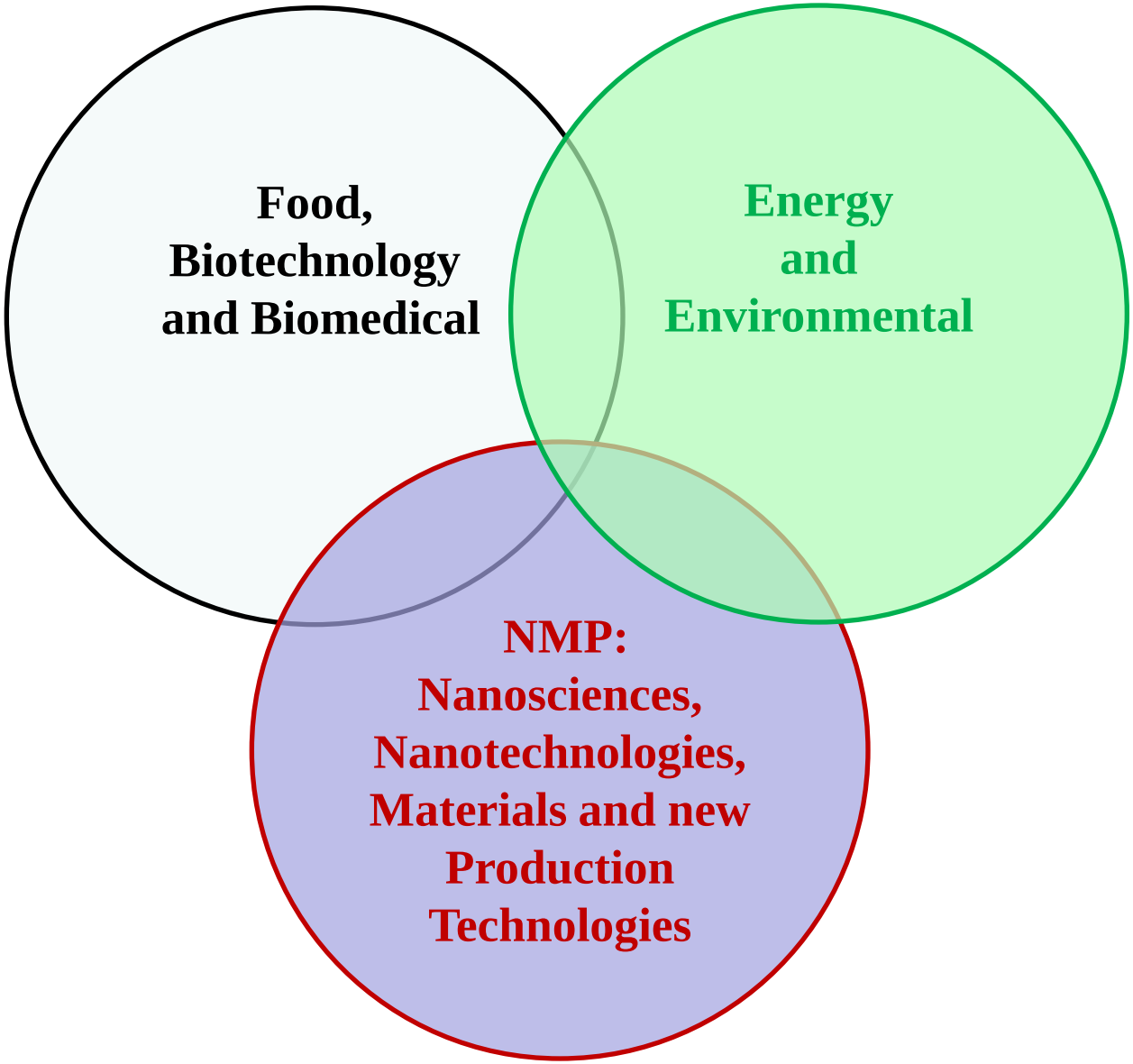
1. Selection of two moderators per round table, one from academia and the other from industry
2. The moderators should keep the discussion focused on the topics of the next FP7 calls relevant to the COST action
3. The moderators should write a 1 page report on their round table discussion and provide some follow-up after the meeting

Follow-up

If some agreement is reached among the partners about possible topics of common interest, future actions should be planned and a coordinator should be identified at some point (even today)

Partners interested to participating to a proposal should directly contact the coordinator

Each coordinator will select the partners for the proposal


Food,
Biotechnology
and Biomedical
Energy
and
Environmental
NMP:
Nanosciences,
Nanotechnologies,
Materials and new
Production
Technologies

Food, Biotechnology and Biomedical

KBBE-2013
Single Stage
5/2/2013

Food Processing
2.3-01: Development and industrial application of sensors for food processing operations
Coordinator: David Fairhurst

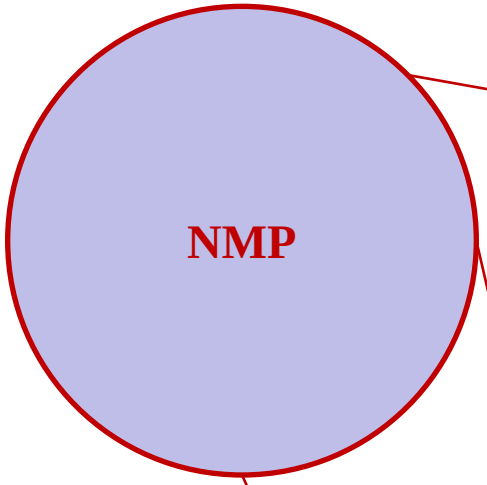
Environmental impact
2.5-02: Saving water and energy for resource-efficient food processing
Coordinator: Simeon Stoyanov,

The Ocean of Tomorrow
Single Stage
7/2/2013

1 Biosensors for real time monitoring of biohazard and man made chemical contaminants in the marine environment

HEALTH-2013-INNOVATION
Two Stage
2/10/2012

1.3-2: Innovative approaches to address adverse immune reactions to biomedical devices, implants and transplant tissues.
Coordinator: Dusko Cakara, James Ferri



NMP CSA
Single Stage
4/12/2012

1.1-1 Exploration, optimisation and control of nano-catalytic processes for energy applications

NMP
Small/Large/SME
Two Stage
23/10/2012

2.3-1 Advanced materials – our allies for a sustainable future
Coordinator: Neil Shirtcliffe, Marite Cardenas-Gomez, Tatiana Gambaryan Roisman, Glen Mchale, Alidad Amirfazli

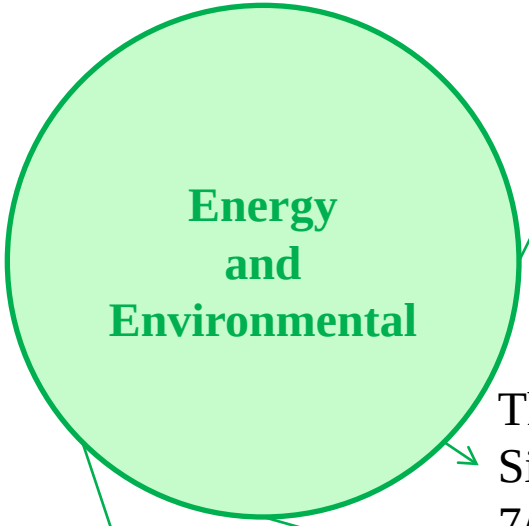
1.2-1 Nanotechnology-based sensors for environmental monitoring
Coordinator: Vasileios Koutsos, Frieder Mugele

ERA-NET
Single Stage
28/02/2013

2.2-4 Materials solutions for durable energy harvesters

1.1-2 Self-assembly of naturally occurring nanosystems
Coordinator:

SMART, GREEN AND INTEGRATED TRANSPORT:
systems, materials and techniques for next generation infrastructure



Energy Call
One Stage
28/11/2012

5: CO_2 Capture and Storage Technologies for Zero Emission Power Generation
Pre-coordinator: Libero Liggieri

10.1.7: Integrated research programme in the field of bioenergy

10.1.9: Integrated research programme on electrochemical storage

The Ocean of Tomorrow
Single Stage
7/2/2013

3 Innovative antifouling materials for maritime applications
Coordinator: Sami Franssila

Energy-efficient Buildings
Single Stage
4/12/2012

EeB.NMP.2013-2
Safe, energy-efficient and affordable eco-innovative materials for building envelopes and/or partitions to provide a healthier indoor environment
Coordinator: Tomasz Sosnowski

Materials for Green Cars
Single Stage
4/12/2012

GC.NMP.2013-1
Improved materials for innovative ageing resistant batteries

KBBE.2013.2.3-01: Development and industrial application of sensors for food processing operations

Call: FP7-KBBE-2013-7 – single stage

The aim of this topic is to develop versatile and affordable sensors to be applied for the quantitative, real-time, on-line or in-line control of critical quality and performance attributes for raw and in-process materials during food processing in the context of Process Analytical Technology (PAT). The sensors can also be part of a software sensor for statistical data analysis and interpretation, and can be used as a tool predicting the features of the final product. The rapid, sensitive and easily cleanable sensors developed ensure both food quality and safety and therefore reduce the amount of non-conforming products to be wasted, thereby leading to higher bio-resource efficiency and production sustainability. The sensors are integrable in systematic preventive approaches such as the Hazard Analysis and Critical Control Point (HACCP) method, and serve as building-blocks for practical decision-making tools and early warning systems. They are auto-adaptive, quickly operative for any product or condition and robust to the variability of raw materials and line operators. Dissemination to equipment producers and the food industry and demonstration activities in the food industry are required to fill the gap between development of the concepts and practical implementation.

Funding scheme: Collaborative Project (small or medium-scale focused research project targeted to SMEs).

Up to three projects may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 3 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 20 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: This topic boosts the competitiveness of the European processing industries and increases the number of patents in this area. It also contributes to reducing food waste and to production sustainability, through more efficient control of processes. The results of research on this topic are of interest and potential benefit to SMEs in the IT, equipment and food industries. Strong participation by SMEs in the project itself will contribute to reaping that benefit. The European added value lies in the need to build up critical mass for multilateral efforts by all the players mentioned above.

KBBE.2013.2.5-02: Saving water and energy for resource-efficient food processing
Call: FP7-KBBE-2013-7 – single stage

The aim of this topic is to provide engineering offering a means for significant and simultaneous saving of water and energy53 along the entire length of the post-harvest chain at all scales of business: from supplying raw ingredients to processing (operations and cleaning), packaging, warehousing, distributing, retailing and household handling of food commodities. A sufficiently representative sector of the food industry has to be targeted; the selection has to be well justified in terms of technological and policy relevance. Optimised, emerging and novel food production and storage technologies, equipment and/or logistics are developed for sustainable, environmentally-benign, water- and energy-efficient and consumer-friendly food manufacturing and handling, whilst improving or at least maintaining food quality and safety. For that purpose, a diagnosis has to be performed of the water and energy consumption of the food processing and the whole food chain in the sector targeted. This also involves considering the rebound effect, process modelling and simulation, and an environmental, social and economic life-cycle assessment of processes in line with the International Reference Life Cycle Data System (ILCD) handbook54. Dissemination of research results to equipment producers and the food industry and demonstration activities in the food industry are required to fill the gap between development of the concepts and practical implementation.

Funding scheme: Collaborative Project (large-scale integrating project targeted to SMEs). Up to three projects may be funded.

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- The estimated EU contribution going to SMEs shall be at least 20 % of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the Grant Agreement.

Expected impact: The European added value lies in an innovation-driven increase in the competitiveness of food producers and food equipment manufacturers, in particular SMEs, while reconciling sustainability imperatives. Involving SMEs in the project itself contributes to achieving these societal objectives. The research leads to notable reductions in water and energy consumption, while at the same time ensuring sustainable economic growth. The

OCEAN 2013.1 – Biosensors for real time monitoring of biohazard and man made chemical contaminants in the marine environment

FP7 Cooperation Work Programme: Food, Agriculture and Fisheries, and Biotechnologies

Call: FP7-OCEAN-2013

Due to growing concerns about the health of the oceans and their capacity to continue to provide resources, goods and services as well as associated risks to the human health, there is an increasing demand for real-time monitoring of the environmental status of marine water quality and the provision of early warning systems. Real-time in situ monitoring of marine chemical contaminants (including emerging pollutants, biohazards e.g. algal toxins) is of utmost importance for the sustainable management and exploitation of the seas and their resources.

Technology wise, marine biosensors have the potential to offer unique features for highly specific and precise measurements, including under multi-stressor conditions, by combining technological elements (including nanotechnologies) and bio-receptors in a single measurement device. Thus they could open new avenues to respond to the growing need for accurate real time monitoring of the quality of sea water and marine ecosystems to support relevant EU legislations such as the Marine Strategy Framework Directive (MSFD)46.

Based on most recent knowledge on genomics and physiology as well as on materials, nanotechnology, information technologies and relevant existing detection/monitoring technologies, the research under this topic should aim at developing innovative real-time, in situ biosensors, taking advantage of nanotechnology when applicable. These sensors should target the detection and monitoring of high impact and presently difficult to measure emerging pollutants and other substances, such as algal toxins and their producers, synthetic organics, herbicides/pesticides and persistent organic pollutants (POP), including polycyclic aromatic hydrocarbons (PAH) and should enable early diagnosis of deterioration of the environmental status of the marine waters in multi-stressor conditions.

The proposals should include a test phase to demonstrate the potential of these biosensor(s) for in situ environmental and/or aquaculture related applications. Measurement devices should

HEALTH.2013.1.3-2: Innovative approaches to address adverse immune reactions to biomedical devices, implants and transplant tissues. **FP7-HEALTH-2013-INNOVATION-1.** Administration of biomedical devices, implants or tissue transplants can cause severe and often chronic, adverse reactions of the human immune system. Projects will aim to identify adverse immune reactions caused by such devices or tissues using systems immunological studies and other innovative approaches, and develop remedial strategies. Research consortia will be multidisciplinary, bringing together basic immunology, epidemiological and clinical expertise, with systems and cellular biology know-how and a thorough understanding of product development and regulatory issues. A strong participation of key players from industry and the clinical field is essential.

Note: Limits on the EU financial contribution will apply and will be implemented strictly as eligibility criterion.

Funding schemes: Collaborative Project (small or medium-scale focused research project).

One or more proposals may be selected.

Expected impact: A better holistic understanding of adverse immune reactions should allow the better design of medical devices and materials for implants, and improve outcome of tissue transplantation. Development of novel therapeutic or preventive strategies to combat adverse immune reactions.

Additional eligibility criteria:

1. The **requested EU contribution per project** shall not exceed EUR 6 000 000.
2. The **estimated EU contribution going to *industry including SMEs shall be 30%* or more** of the total estimated EU contribution for the project as a whole. The SME status and the financial viability will be assessed at the end of the negotiation, before signature of the grant agreement.

II.5.1. Area Energy.5.1: CO2 Capture

Topic ENERGY.2013.5.1.1: Scale-up of advanced high-efficiency capture processes

Open in call: FP7-ENERGY-2013-1

***Content/scope*:** The objective is the scaling-up of advanced capture technologies that have shown considerable potential for reduction of the energy penalty and a significant overall improvement of cost-efficiency of the whole capture process. Projects can address innovative capture technologies (such as for example solid sorbents, cryogenics and membranes). They should define operating conditions and provide proof of the reliability and cost-effectiveness of these concepts through pilot testing, and aim for an ambitious scale-up as compared to the state-of-the-art. The proposal should state a clearly defined target for the reduction of the energy penalty and the relative incremental operating costs of the capture process, and should assess the environmental impact of the technology at plant scale.

Funding scheme: Collaborative Project

Expected impact: Progress in this area should result in a significant reduction of the energy intensity of the capture process for power plants or other energy-intensive industries, and in a substantial decrease of the cost of capture. The project should prepare the ground for precommercial demonstration of the technology. It should actively contribute to the implementation of the Roadmap and Implementation Plan of the CCS Industrial Initiative of the SET-Plan, and, whenever relevant, contribute to the monitoring and knowledge sharing schemes of the Initiative.

Additional eligibility criterion: The requested EU contribution per project shall not exceed EUR 8 Million.

Additional information: The participation of industry and innovative SMEs is particularly encouraged. To realise prototypes or pilots at a meaningful scale, a substantial part of the funding is expected to come from third parties. The European Commission reserves its right to ask the project, during the negotiation, to establish strong links, where appropriate, with relevant R&D projects at EU, national or regional level.

Topic ENERGY.2013.5.1.2: New generation high-efficiency capture processes

Open in call: FP7-ENERGY-2013-1

***Content/scope*:** The objective is to support the development of high-potential novel technologies or processes for post- and/or pre-combustion CO2 capture. Research should follow new paths leading to highly innovative technologies and materials for CO2 capture applications with the potential for real breakthroughs. This could include systems based on solids or liquids or a combination of these such as enzyme based systems, bio mimicking systems or advanced solid sorbents and membranes. Environmentally benign technologies should be pursued and their environmental impact addressed in the project also in view of future scaling up. Projects shall provide "proof of concept" through prototype testing. Any research that constitutes a technology demonstration at large scale or a combination of CCS technologies proven at pre-demonstration pilot scale will not be considered for funding.

Funding scheme: Collaborative Project

Topic ENERGY.2013.10.1.7: Integrated research programme in the field of bioenergy

The integrated research programme supported under this topic should contribute to the medium to long term objectives of the SET Plan for bio-energy, anticipating the long term perspective of the European Industrial Bioenergy Initiative (EIBI). It aims at preparing for the next wave of industrial demonstrations and deployment of bioenergy technologies. It will support R&D avenues leading to the most advanced, innovative and groundbreaking bioenergy pathways, also taking into account the requirements in terms of sustainability, cost effectiveness and of the users.

Topic ENERGY.2013.10.1.9: Integrated research programme on electrochemical storage

Electricity Storage has been identified as a critical technology for the transition to and operation of a more sustainable and low carbon European energy system. The integrated research programme should address the critical shortcomings of existing grid-scale technologies by developing new electrochemical paths and proof-of-concept for emerging storage-component technologies. Activities should focus on proposing and developing novel and innovative designs for stationary batteries and other electrochemical devices to be used in grid-scale energy storage applications. Proposers should consider the results of document SEC (2011) 1609 – Materials Roadmap Enabling Low Carbon Energy Technologies.

OCEAN 2013.3 Innovative antifouling materials for maritime applications
Call: FP7-OCEAN-2013

Biofouling is a major concern for mobile (e.g. ships) and stationary (e.g. aquaculture cages or offshore power generation systems) maritime structures, sensors and equipments. It negatively affects marine and maritime activities by creating a need for regular maintenance, which is costly, might disrupt operations and is potentially polluting. With the purpose of avoiding toxic biocides and heavy metals used in antifouling coatings, novel alternative cost efficient and environmentally friendly approaches are needed.
The proposals under this topic should focus on developing new, well beyond the state of the art, antifouling materials and should address in an integrative way mobile and stationary maritime applications.
On the basis of a thorough analysis of the state of the art, research could draw on the whole range of antifouling materials e.g. foul release approach, biomimetics, marine biotechnology based coatings, polymers etc. The proposals should include benchmarking of existing materials, technologies and on-going research. In this sense environmental and economic factors, as well as performance, must be duly considered. Improvement in the understanding of marine biofouling processes, including their relation with biocorrosion, with respect of the developed materials should be an integral part of the proposals. For the resolution of the technological bottlenecks impeding the achievement of well performing final materials and products, applicants are welcome to investigate and exploit the potential offered by converging technologies such as e.g. materials science and engineering, maritime technology, nanotechnology and biotechnology.
The proposals should include relevant field testing for all the selected applications. Development, improvement and/or standardisation of relevant protocols should be included. Proof of concept in terms of product and/or process should be delivered within the project, excluding commercially usable prototypes (in compliance with European Commission Communication 2006/C323/01), but convincingly proving scalability towards industrial needs. In the case of marine biotechnology based approaches the issues of supply and the need for the biobased active antifouling compounds to be produced in bulk, as required for final commercial production should be given due consideration. The proposals should follow a life cycle approach for the new materials and their selected applications also taking into account issues of cost efficiency, effective life span, production, handling, maintenance, environmental impact, ecotoxicological profile and end of life. The proposals should include assessment of the environmental, health and toxicological effects according to REACH35, OECD Guidelines for the Testing of Chemicals and/or relevant international standards. The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence.* The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.
Funding scheme: Collaborative project
Several projects may be funded within the total budget of the topic (EUR 15 000 000).
Additional eligibility criteria:

EeB.NMP.2013-2 Safe, energy-efficient and affordable new eco-innovative materials for building envelopes and/or partitions to provide a healthier indoor environment

Technical content/scope: A healthier indoor environment during the service life of a building is becoming more and more critical because the implementation of energy efficiency measures leads to the construction of more tightly sealed buildings with reduced ventilation rates. Furthermore, increasingly synthetic building materials and furnishings, or natural products formulated with chemicals, biocides etc., are used. Improved construction techniques, caulking and sealing limit the amount of air which escapes. Consequently pollutants can build up to unhealthy levels inside the buildings.

Several factors affect a healthy indoor environment. Among the most important are: release of dangerous substances, Volatile Organic Compounds (VOCs) such as formaldehyde, wood preservatives, radon, fibres, particulate matters, moisture and humidity, rotting and microbiological/mould growth, etc.Building envelopes play an important role in controlling the amount of moisture which enters in the building or leaves it. Noise protection and comfort with regard to temperature and humidity distributions are also important factors that may be valorised to contribute to a healthy indoor environment. Comfort influences health also in the long term.

Research proposals should address the development of new eco-innovative materials for the building envelope and/or internal walls/partitions leading to healthier indoor environment. Issues on indoor environment related to the building content (interior decoration, carpets, paints and lacquers, furniture, electronic equipment, cleaning supplie etc.) or use (e.g. cleaning agents) are *not covered by this topic*. Technological solutions, such as improved ventilation and air filtration, are likewise *not covered by this topic*. The proposed solutions should go well beyond the state of the art and primarily improve the indoor environment. The cost-effective use of nanotechnologies can contribute to solve humidity, odour and pollutant problems.The following factors should also be considered: low embodied energy and enhanced durability for increased use duration, reduced maintenance and consequently reduced costs, respect of sustainability principles (the sustainability of each developed solution should be evaluated via life cycle assessment studies carried out according to the International Reference Life Cycle Data System - ILCD Handbook); application to both new build and renovation when relevant; ease of installation; offer c realistic solutions at a reasonable price; offer of increased comfort and noise reduction. Recycling/reuse of materials may also be addressed. Standardisation aspects can be considered particularly in relation with the work carried out in CEN/TC 350 and CEN/TC 351. Proof of concept in terms of one (or more) component(s) containing

Public-Private Partnership 'Green Cars' – Call implemented by NMP Theme
Call title: **Materials for Green Cars - 2013**
Call identifier: FP7-2013-GC-MATERIALS
Date of publication: 10 July 2012
Deadline: 4 December 2012 at 17.00.00 (Brussels local time).
Indicative budget 77 78**: EUR 20 million** from the 2013 budget.
The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call.
Topics called:
Activity/ Area Topics called Funding Schemes Budget 20 Million EUR
GC.NMP.2013-1 Improved materials for innovative ageing resistant batteries Large-scale integrated collaborative projects
• **Eligibility conditions**
The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable. Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants. The minimum number of participating entities required, for all funding schemes, is set out in the Rules for Participation: For Collaborative projects, the minimum condition shall be the participation of 3 independent legal entities, each of which is established in a Member State or Associated Country and no two of which are established in the same Member State or Associated Country
• **Additional eligibility criteria**
Topic GC.NMP.2013-1: In addition to the general eligibility criteria, which are given in Annex 2 to this Work Programme, for Large-scale integrating collaborative projects **the minimum requested EU contribution must be greater than EUR 4 000 000**. Please note that the financial resources mobilised within a project will be assessed during the evaluation against the real work to be carried out in the project. 75 The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication. 76 The Director-General responsible may delay this deadline by up to two months. 77 A single reserve list will be constituted if there are a sufficient number of good quality proposals. It will be used if extra budget becomes available. 78 Under the condition that the draft budget for 2013 is adopted without modification by the budgetary authority.

NMP.2013.1.1-1 Exploration, optimisation and control of nano-catalytic processes for energy applications

Technical content/scope: Catalysis is of vital importance to our society. The availability of high quality and inexpensive chemicals necessary to support a competitive economy relies on industrial catalytic processes. Catalysts are also the key to the development of novel technologies for sustainable energy production and distribution as well as environmental protection (e.g. emission control).

While the call topic NMP.2012.1.1.-1 focused on the rational design of nano-catalysts, the aim of this call is to develop pilot scale production for rational exploration, optimisation and control of nano-catalytic processes for sustainable energy production. The specific energy production concepts could include production of different fuels (e.g. synthetic, bio or solar fuels) as well as different sustainable feedstock.

More specifically, the goal is to design and up-scale catalytic energy production processes utilising next-generation high-surface area nano-dimensional heterogeneous catalysts with improved activity, durability and/or controlled chemical selectivity from laboratory scale to pilot scale. Approaches can be based on improvement of existing catalytic materials, and/or by development of innovative concepts for which the proof of principle has been given already. The final target is to demonstrate the technical and economic viability of the global process, i.e. from synthesis to efficiency and durability of the nano-catalytic systems.

The novel nano-catalytic systems with pre-defined properties require:

– Precise control over size and shape over length scales spanning 1nm-100nm, structure and composition of the catalyst, allowing efficient control of reaction pathways;

– Significant advances in theoretical descriptions and modelling for increased understanding of catalyst-support interactions, complex catalytic reactions performance and deactivation phenomena;

– Advances in nanoscale techniques, especially those that offer in-situ monitoring and which characterise the 'working state' of the catalysts under real conditions (e.g. elevated temperatures and pressures, high reactant flux) with the objective of predicting and intensifying complete catalysing processes.

– Long-term stability under operating conditions; Catalyst deactivation mechanisms, such as thermal and/or gas-induced sintering of nanoparticles or degradation of nanoparticles or nanostructures, should also be considered.

NMP.2013.2.3-1 Advanced materials – our allies for a sustainable future

Technical content/scope: Materials play a key role in industry and society, enabling changes and progress, thus contributing to the generation of growth and the creation of wealth and jobs in Europe. Mastering the properties, design, production, reuse or recycling of materials and creating new and improved ones is determinant for achieving the goals of the European Innovation Policy, in agreement with the European Strategy for a smart, sustainable and inclusive growth – Europe 2020. New materials enable industrial and commercial success for both existing and not-yet-existing products and processes. They introduce new functionalities and improved properties adding value to existing products, thus representing an invisible revolution in existing industrial productions. They also allow the conception and realisation of fully new products and processes, which are more competitive and sustainable. But do European citizens know enough about materials? Different studies and surveys indicate that the workforce demand related to technological developments in companies involved in the development and use of new materials will increase. Are our citizens sufficiently aware of this?

The proposed support action(s) should deliver media product(s) for a general public, often scientifically unprepared, presenting new materials (including nanostructured materials) and how they have helped, are helping and/or will help creating in Europe and world-wide an industrial economy that serves citizens better and is more favourable to the environment. One or more television productions, or a series of them, is a non-binding example of a product that is expected under the present call. While highlighting the importance and the positive contribution of new materials for our future sustainable industrial economy, propaganda tones should be avoided, and the issues should be presented responsibly and in a balanced way, including challenges, debates or still-existing critical aspects where appropriate. An interaction with local, regional or national authorities, science organisations, occupational health and safety organisations, expert institutes, social scientists, non-governmental organisations and other stakeholders can be considered, where this is relevant. A product dedicated specifically to children and younger people with the objective of attracting their interest to materials and its research would also be eligible within this call. Messages should be tailored to the needs and knowledge levels of specific audiences. An additional point that may be considered is that new materials (e.g. originating from converging technologies) put new requirements on educational institutions that have to train future workers and provide for

NMP.2013.1.2-1 Nanotechnology-based sensors for environmental monitoring

Technical content/scope: Progress in nanosciences has led to a range of new technologies that allows us to drastically improve, and even rethink and create totally new industrial processes and products, offering new functionalities. Sensors are core elements in any intelligent system for monitoring and controlling natural and industrial environments, and nanotechnology is offering new functionalities opening for totally new sensors, sensing based systems and applications. For example high sensitivity allowing for new or lower levels of detection, long term stability for reliability in use and a much reduced size and affordable cost, enabling the integration of nanosensors, including networks of nanosensors into many other devices and systems.

The specific objective of this topic is to exploit progress in nanosciences to deploy nanotechnology in affordable, mass-produced sensors, and to integrate these into components and systems (including portable ones) for mass market applications in environmental monitoring. Sensing may include chemical, micro-biological and radiological parameters. Deliverables are expected to include the sensor design and fabrication considerations (including the use or development of modelling tools), a technology demonstrator and a positive production capacity feasibility study (including economic assessment) and plans for their commercial implementation.

Systems integration aspects to consider includes easy and fast (multi-)sensor interrogation and interfacing with monitoring and control functions. Reliability is required within the foreseen operating environment, considering temperature, humidity, and other parameters affecting stability. Initiation (re-setting) and calibration requires special attention.

The functionality should be demonstrated by integrating the developed sensor element into an existing or prototype system for validating its industrial relevance in a relevant environment.

Biosensors for monitoring the marine environment are *not covered by this topic*, but by the topic Ocean 2013.1 (section II.4.2).

Funding Scheme: Small or medium-sized collaborative projects

Expected impact: The projects are expected to: (i) demonstrate that nanosensors provide a technically superior, cost effective alternative to conventional sensors; (ii) contribute to the realisation of the market potential of the existing research results; (iii) to enable improved performance of applications in the fields of environmental monitoring, providing significant benefits to the citizens, environment and the European economy.

NMP.2013.2.2-4 Materials solutions for durable energy-harvesters

Technical content/scope: Many applications that need low power are now equipped with a primary battery that needs replacement or makes the device obsolete when exhausted. Energy harvesting technology is increasingly becoming more attractive for a wide variety of self- or low-powered applications, especially with advances in microelectronics and microelectromechanical systems. For instance, secondary micro-batteries in combination with energy harvesters based on photovoltaic, thermoacoustic, thermoelectric, pyroelectric, mechanical/vibrational and electromagnetic sources can offer interesting opportunities to reduce the dimensions of the storage system and enhance the lifetime of the application. Research proposals should address the development of energy harvesting and storage materials for low-power and/or pulsed applications, for example autonomous nano/microdevices, medical implants, smartcards, sensor networks which would lead to a quantifiable advancement on the state-of-the-art. The estimated improvements in output from the harvester, efficiency, reliability and lifetime of the device, technology cost effectiveness, commercial potential, and adequate availability of energy sources for the proposed application should be convincingly assessed in the proposal. Environmental and end-of-life issues should be addressed. Solutions that optimise the size of the harvester with respect to the device and the number of required peripheral components are welcome. Energy harvesting from multiple sources can be considered. Multidisciplinary approaches between physicists, modellers, chemists, engineers and end users are encouraged.

In order to ensure industrial relevance and impact of the research effort, the active participation of industrial partners represents added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

Proposals focusing on the development of organic photovoltaic materials should be addressed to topic NMP.2013.4.0-2.

Funding scheme: Small or medium-sized collaborative projects.

Expected impact: (i) Harvesting material(s) that will significantly improve the efficiency of the devices; (ii) Storage materials that will improve the performance and durability of the devices in terms of power density, capacity and/or energy density; and (iii) advancement of cleaner energy technologies in Europe.

SST.2013.1-3. ERA-NET Plus 'Advanced systems, materials and techniques for next generation infrastructure'
Call: FP7-ERANET-2013-RTD (see Annex 4)

Content and scope: A fundamental shift in the performance of road transport requires a new generation of infrastructure. The main aim of this ERA-NET Plus is to launch a joint transnational call for proposals for research, development and innovation in the field of advanced systems, materials and techniques for next generation road infrastructure. The joint call will focus on techniques using advanced materials, including those from other industries or from using conventional materials in an innovative way. Actions under this joint call will include the development of sophisticated modelling techniques or the testing and monitoring of novel techniques with regard to its impacts on reliability, safety and environment. Cooperation with the USA in the respective areas should be sought. Care should be taken to ensure complementarities with the activities carried out in the ERA-NET ROAD.
The thematic focus of this joint transnational call should be proportionate with the funds available in order to ensure a reasonable rate of success in the call. Details on the topics covered by the call will be decided by the participants in due time but shall be selected upon consultation with the concerned Commission services. Funding of projects will be on the basis of a common pot.

Additional information: The deadline included in the call FP7-ERANET-2013-RTD applies for this topic. More information about the ERA-NET Plus actions (including eligibility criteria) can be found in Annex 4 of the work programme.

Expected impact:

• Improving coordination and reduce overlap in research and innovation in the field of affordable green materials and technologies for reliable road infrastructure.
• Achieving critical mass and ensure better use of limited resources in fields of mutual interest. A significant participation of Member States and Associated States is expected.
• Sharing good practices in implementing research programmes.
• Promoting transnational collaboration and generating new knowledge and innovation
• Mobilising SMEs in transnational projects to enhance innovation.

CHALLENGE

Topics from the Food/Biotechnology and Biomedical Round Table
Moderators: S. Stoyanov, N. Denkov

Biosurfactants
- Extraction, membranes, separation
- Structure-property relationship
- Applications

Novel methods for emulsification and foaming
- Large scales
- Safe, robust and sustainable
- Atomization

Large scale production of nanofibers
- Liquid-liquid spinning
- Tissue engineering
- Product structuring

Materials and methods for drug delivery
- Aerosols
- Microgels
- Liposomes

Stability under stress
- Phase change materials
- Evaporation

Bioactive interfaces

Probiotics
- Production and protection

Topics from the Nanotechnology Round Table
Moderators: M. Ersoz, A. Amirfazli

Hydrogen production by biocatalysts (possibly linked with food)

Heavy metals
Patterned surfaces for sensing devices
Controlling self-assembly for sensing devices
Fibers as sensors
Block-copolymers

Using natural surfactants for self-assembly of nanofibers

Topics from the Energy/Environment Round Table
Moderators: C.W.M. van der Geld, R. Orr, C. Koukiotis

Liquid-liquid interfaces
Coordinator. M. Antoni
- Drop coalescence
- Drop breakup
- Oil-water separation
- CO_2 capture (emulsified systems)
- Oil-water

Gas-liquid interfaces
- Bubble coalescence
- Bubble breakup
- Drop evaporation (spray evaporation)
- Phase transitional flows
- CFD modeling
- Flow regime transitions
- Centrifugal separations
- Non-acqueous foams
- Foams in emulsions

Liquid-gas-solid interfaces
Coordinator: Tatiana Gambaryan Roisman
- Droplet evaporation near contact lines
- Boiling
- Liquid film evaporation
- Drop evaporation with contaminants (coffee stain, porous substrate)
- Drop condensation + drop drainage
- Motion of aerosols in porous media
- Particle coated drops
- Flotation

All: surfactants, foams, electric fields, defoaming, solid foams

Topics from the Energy/Environment Round Table - more

Green and Smart

- Additive processing (3D printing)
- Rapid prototyping
- Selective laser sintering
- Particle-coated drop
- Energy saving (economizers)
- Less additives
- Electric fields as alternative to surfactants
- pH control, low salts, surfactants
- De-inking (cradle-to-cradle)
- Medical (?)
- Smart valves
- Reliability + robustness of process
- Anti-icing
- Water treatment (+ economizer)
- Phase change materials
- CO2-methane separation
- Nanoparticle interactions with biological interface