



EUROPEAN COMMISSION

ICT - INFORMATION AND COMMUNICATION TECHNOLOGIES

A Theme for research and development under the specific programme “Cooperation” implementing the Seventh Framework Programme (2007-2013) of the European Community for research, technological development and demonstration activities

Work Programme 2009-10 Update

<http://cordis.europa.eu/fp7/ict/>

ICT WP 2009-10 Update

1/ Contribution of the ICT Theme to Public-Private Partnerships for R&D in the European Economic Recovery Plan¹

The Recovery Plan proposed by the Commission on 26 November 2008 includes public-private partnerships for research and development in three areas. The initiatives will be implemented through a series of coordinated calls between the relevant FP7 themes, reflecting research roadmaps and priorities established by the relevant industrial partners, as follows:

- The 'Factories of the Future' initiative involving financial support from the NMP² and ICT Themes in FP7.
- The 'Energy-Efficient Buildings' initiative involving financial support from the NMP, Energy, ICT and Environment Themes.
- The 'Green Cars' initiative involving financial support from the Transport, ICT, Energy, NMP and Environment Themes.

ICT plays an important role in the three initiatives:

- 'Factories of the Future': ICT is at the heart of innovation in modern manufacturing and provides essential tools to face today's industrial challenges such as increasingly global networked operations, more agile manufacturing and customisation, lower carbon emissions and energy efficiency as well as optimised design of manufacturing systems and better process life cycle management.
- 'Energy-Efficient Buildings': ICT helps improve energy efficiency in buildings through, for example, better monitoring and control of energy consumption, advanced lighting systems, and smarter and optimised interconnections with the power grids.
- 'Green Cars': ICT is essential for developing fully Electrical Vehicles, e.g. for battery management and power supply, for control mechanisms and for the interconnections with the transport and power infrastructures.

¹ COM(2008)800

² Nanosciences, Nanotechnologies, Materials & New Production Technologies

Objective ICT-2009-10.1: Smart Factories: ICT for agile and environmentally friendly manufacturing

Targeted outcomes:

- a) Integrated process automation and optimisation for sustainable manufacturing: Highly integrated shopfloor-based platforms and systems³, in seamless cooperation with enterprise software⁴, capable of achieving operational targets, such as yield and quality increase, while ensuring energy efficiency and reduction of waste. R&D is expected to be accompanied by training measures.
- b) Applications based on context-aware ICT and scalable networks of sensors, exhibiting features such as energy autonomy, wireless connectivity, self-diagnosis and repair integrated in machines and factory-level infrastructure, supporting real-time monitoring of energy use and material flow. Work should aim at promoting standards-based approaches in conjunction with international initiatives involving industry groups and standardisation bodies⁵.
- c) Robotics-enabled production processes tested and validated in real-world environments. Projects are expected to involve system integrators and manufacturers and to test and validate robotic prototypes, paving the way for large-scale operations in smart factory environments. The projects should target domains which have until now not made much use of robotics technology such as in food processing and packaging, service supply (logistics, transport and warehousing), lightweight goods industries and SMEs.
- d) Laser applications: To integrate, test and validate novel lasers and laser systems (including for example high-power sources, new wavelengths, frequency conversion and remote processing) in energy-efficient processes, and/or for the production of environmentally friendly products.
- e) European "ICT for Factories of the Future" Coordination Action: One coordination action should bring together all relevant stakeholders and aim at facilitating industrial learning about the role of ICT in "Factories of the Future" in Europe. Its tasks should include exchange of engineering and manufacturing knowledge across industry sectors and elaborate a European vision and roadmap "ICT for Factories of the Future" in conjunction with other related activities (e.g. Manufuture ETP and IMS).

Proposals in a), b), c), d) are expected to be industry-led, to focus on the use of advanced ICT based technologies and to contain a strong validation element with quantifiable targets.

Expected impact:

- A higher level of intelligence and environmental consciousness on the shopfloor through context-aware, fault-tolerant, adaptable, reconfigurable, interoperable, wireless and robust ICT.

³ e.g. MCS, SCADA, DCS, PLC

⁴ e.g. MIS, ERP, MES

⁵ e.g. IEC/CENELEC, NAMUR, IEEE, ISA, NIST

- Facilitated introduction of advanced automation into mainstream manufacturing, and promotion of the development of an early European market for advanced technologies such as electronic and photonic devices, control and new assistive automation and robot systems.
- Stronger penetration of advanced automation into small-scale manufacturing and crafts, especially through the introduction of new assistive automation and robot systems.
- Higher productivity of highly customised manufacturing in Europe and reduced emissions and waste.

Funding schemes

a), b): IP

c), d): STREP

e): CSA

Indicative budget distribution

IP/STREP: EUR 33.5 million; the objective is to support at least one IP under a) and at least one IP under b)

CSA: EUR 1.5 million

Call

ICT Call 5

Objective ICT-2009-10.2: ICT for energy-efficient buildings and spaces of public use

Targeted outcomes:

- a) Integrated ICT-based management and control systems governing all energy-efficient sub-systems, such as solid state lighting, heat exchange or air treatment, deployed in spaces of public use. These control systems should interoperate with other ICT-based sub-systems which may be in place to ensure security, safety and comfort.

The system may cover both the inside of buildings as well as the exterior and surrounding space. Examples of such spaces include: a motorway service area, a football stadium with its surrounding parking space, a university campus or a shopping mall.

In addition to systems integration, proposals should include a substantial validation phase focussing on the operation of the building(s) and surrounding space. During this phase, proposals should record evidence and draw lessons on the benefits and total cost of operation for use by those planning to deploy and finance such systems. Proposals should also consider any relevant contributions to/from standardisation and regulation measures, as well as guidelines for future procurement schemes.

- b) European "ICT for Energy-efficient Buildings" Forum: One coordination action should bring together all relevant stakeholders to identify and review the needs in terms of research and systems integration. Its tasks should include editing and up-dating the REEB research Roadmap⁶, the organisation of expert hearings, and dissemination and networking events. The Forum should also aim at contributing to standardisation and regulation.

Expected impact:

- Contribution to the opening of a market for ICT-based customized solutions integrating numerous products from different vendors and offering services from design of integrated systems to the operation and maintenance phases.
- Establishment of a collaboration framework between the ICT and buildings and construction sectors aimed at exploiting opportunities for the development of ICT-based systems in compliance with the Energy Performance of Buildings Directive.
- Radical reduction of energy consumption and CO₂ emissions, in line with the policy framework for facilitating the transition to an energy-efficient, low-carbon economy through ICT⁷.

Funding schemes

- a) STREP; b) CSA

⁶ REEB: The European Strategic Research Roadmap to ICT enabled Energy-Efficiency in Building and Construction, <http://www.ict-reeb.eu/>

⁷ COM(2009)111.

Indicative budget distribution

STREP: EUR 14 million

CSA: EUR 1million

Call

ICT Call 5

Objective ICT-2009-10.3: ICT for the Fully Electric Vehicle

Target outcomes:

- a) Highly energy-efficient ICT components and solutions for Fully Electric Vehicles (FEVs), including adaptive and distributed control solutions, as well as new architectures, infrastructure interfaces (with both the road and the power grid) and overall system optimization. Projects should address optimization at vehicle and system levels, derive requirements and define standards - where appropriate - for subsystems, components, communications and closed-loop control, making components and subsystems work together in synergy.

In order to reach significant breakthroughs in performance, efficiency, complexity management, system integration, safety of components and cost reduction while ensuring robustness and reliability, thorough modelling, simulation, implementation and testing of overall systems and components will be required. Research should also consider life-cycle assessment and well-to-wheel analysis, electromagnetic compatibility, high voltage components, and standardisation (voltage, current, temperature, communication and data protocols). Safety procedures, qualification and validation tests, and adaptation of safety systems for electric vehicles should also be addressed. Projects should preferably address several topics, and consortia should represent a critical mass along the value chain.

Research priorities are:

1. New solutions for overall efficiency gains in the electric vehicle:
 - (i) smart ICT solutions and models for electrical and thermal management
 - (ii) development of energy efficient and lightweight electrified auxiliaries (e.g. air conditioning, steering, lighting, brakes)
 - (iii) closed-loop control and cooperative interaction of distributed subsystems
2. Safe and robust sub-systems: communication, sensors, actuators, distributed controls, power electronics, as well as adaptive components for active safety and comfort.
3. Advanced fail-safe systems and electrical architectures, new concepts for vehicle-to-road infrastructure integration based on cooperative system concepts and new generation Advanced Driver Assistance System (ADAS) and active safety systems for FEVs.

- b) European Fully Electric Vehicle Coordination Action: Coordination of FEVs research activities to identify and continuously review the needs in terms of research, components, and systems integration. This includes editing and regularly updating a European FEV roadmap, the organisation of expert hearings and networking events, and coordination with FEV-related activities at the national and global levels.

Additional coordination activities can include assessment of energy efficiency and life cycle impact, infrastructure and regulations enabling and leveraging the technologies for FEVs and their convergence with regenerative energy sources, road and passenger safety as well as standardisation.

Expected impacts:

- Increased overall power and energy efficiency of FEVs through ICT solutions for optimised architecture, integration, controls, systems and components, given current and anticipated constraints in terms of energy storage systems.
- Strengthened global competitiveness of the European automobile sector, including the components and systems suppliers and contribution to the creation of knowledge-based jobs in a sector of strong economic impact for Europe.
- European leadership in the move towards the electrification of mobility and transport of goods and passengers.
- Reinforced coordination of the research activities on FEVs across Europe.

Funding Schemes:

a) STREP; b) CSA

Indicative budget distribution

STREP: EUR 19 million

CSA: EUR 1 million

Call

ICT Call 5

2/ Strengthening the level of cooperation in ICT R&D across Europe

Objective ICT-2009.9.5: Supplements to Strengthen Cooperation in ICT R&D in an Enlarged Europe

Target outcome

The target is to reinforce the cooperation between research teams across the 27 Member States and to strengthen the integration of the European Research Area in ICT.

Integration is characterized by the level of collaboration between relevant organizations within the Member States and by the appropriate Community dimension brought into the proposed research results and solutions.

In view of reaching the above target, support will go to the participation of additional partners in on-going FP7/ICT projects with the aim to increase the level of expertise, broaden the scope and/or speed up developments.

Expected Impact

- Reinforced cooperation and better exploitation of ICT R&D synergies across the 27 Member States.
- Wider participation in Community-supported ICT research projects across all Member States.
- Paving the way for strategic partnerships in view of gaining access to knowledge, developing standards and interoperable solutions and strengthening European competitiveness.

Funding scheme

Additional funding to on-going FP7 ICT IP and STREP projects ending after April 2011.

Indicative budget distribution

EUR 10 million

Call

ICT Call 5