



New public-private partnerships for research in the manufacturing, construction and automotive sectors

European PPP research supports economic recovery.
Progress Report: July 2010

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Cataloguing data can be found at the end of this publication.

Luxembourg: Publications Office of the European Union, 2010

ISBN 978-92-79-15787-5

ISSN 1018-5593

doi: 10.2777/50346

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Printed in Belgium

PRINTED ON WHITE CHLORINE-FREE PAPER

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PPPs boost innovation in key industries

Public-Private Partnerships launched by the EU as part of its European Economic Recovery Plan are funding research and innovation to revitalise the European manufacturing, construction and automotive sectors. Progress to date shows that the scheme is on course to achieve its goals.

The European Economic Recovery Plan, adopted by the European Commission on 26 November 2008 and endorsed by the European Council on 11-12 December 2008, proposed a series of research actions to develop new technologies for the vitally important manufacturing, construction and automotive industries, which have experienced significant falls in demand following the global economic downturn. To meet the short-term aims, it was important to encourage SME participation and to allow rapid conversion of research results into marketable innovations. The initiatives will also help to secure the long-term future of an EU in which the economy has to become knowledge-based and low-carbon, as underlined in March 2010 in the Commission Communication 'Europe 2020: A strategy for smart, sustainable and inclusive growth'.

They were launched as public-private partnerships (PPPs) addressing key topics in each of the three sectors:

- **'Factories of the Future'** (FoF), intended 'to help EU manufacturers, especially SMEs, to adapt to global competitive pressures by increasing the technological base of EU manufacturing through development and integration of the enabling technologies of the future, such as engineering for adaptable machines and industrial processes, ICT (Information and Communication Technologies), and advanced materials'.
- **'Energy-efficient Buildings'** (EeB), aiming 'to promote green technologies and the development of energy-efficient systems and materials in new and renovated buildings with a view to reducing radically their energy consumption and CO₂ emissions'.
- **'Green Cars'** (GC), 'involving research on a broad range of technologies and smart energy infrastructures essential to achieve breakthroughs in the use of renewable and non-polluting energy sources, safety and traffic fluidity'.

All share the common goal of mobilising public and private resources for research activities to stimulate a strong resurgence of the hard-hit sectors. Based on matched funding from the Seventh RTD Framework Programme (FP7) and the private sector, the targeted budgets

for the period 2010-2013 are EUR 1.2 billion for FoF, and EUR 1 billion each for EeB and GC. With relatively similar objectives, 'Future Internet', a new PPP devoted to ICT, has also been launched in April 2010.

In addition, the Plan included an immediate injection of EUR 220 million for the Risk-Sharing Finance Facility (RSFF), a loan facility for investment in RTD and innovation set up under FP7. Total RSFF lending in 2009 provided by the European Investment Bank and supported by the European Commission amounted to almost EUR 3 billion, while on-going high demand is expected in 2010. For the period 2011-2013, additional RSFF lending of around EUR 5 billion could be provided, supported by FP7.

Advantages for industry

The initiatives hold many advantages for industry, notably:

- giving renewed confidence to invest in long-term research even when faced with short-term economic problems;
- providing a central role for industry, including SMEs, in the development of strategic roadmaps and in the implementation of research projects;
- presenting a multi-annual integrated work programme with a pre-defined budget, ensuring continuity and allowing industry to make long-term investment plans;
- employing a cross-thematic approach going from basic and applied research through to validation and large-scale demonstration, with an emphasis on impact and exploitation;
- offering increased opportunities to support innovation in SMEs;
- adopting single-stage submission of proposals, leading to a faster evaluation process and shorter time to contract signature.

Fast start

In order to achieve the necessary fast start-up, the PPPs were launched using the established framework of FP7, but also building on the concept of Joint Technology Initiatives (JTIs), originally introduced to support the implementation of the Strategic Research Agendas of certain European Technology Platforms.

To structure the dialogue between the private and public sides of the PPPs, the Commission invited representatives of the industrial and research stakeholders to take part in Ad-hoc Industrial Advisory Groups convened to determine the priorities for shared investment in research. Draft research roadmaps were already prepared and research topics identified well in time for the publication in July 2009 of the first PPP Calls for Proposals, for a total EC contribution of EUR 268 million, included in the Work Programme 2010 within FP7. The finalisation of the Multi-annual Roadmaps, after wide-ranging stakeholder consultations, is mentioned in the following sections.

The manufacturing and construction sectors have also set up non-profit associations – respectively the European Factories of the Future Association (EFFRA) and the Energy-efficient Buildings Association (E2BA) – to facilitate the liaison with the Commission in developing the partnerships and in preparing the multi-annual roadmaps for the remainder of FP7 and beyond.

Representatives of the PPPs were invited by the Commission to join with those from the current JTIs in a JTI Sherpas' Group, seeking to draw lessons from their initial experiences and propose ideas for a more streamlined structure that could be applicable from the start of FP8. In its final report, published in January 2010, the Group provides a blueprint for building the 'ideal house' to accommodate future PPPs. It further recommends that cooperation between the EC and the industry-driven associations should be continued and strengthened.

The EU ministers have also recognised the progress of these initiatives and given continued support to them in the Competitiveness Council meeting of May 2010.

Meanwhile, thanks to the major efforts on all sides, project selection and negotiation of grant agreements are being completed in record time, as evidenced by the signature of the first contracts at a major PPP conference in Valencia, Spain, on 13-14 April 2010. With more negotiations rapidly reaching their conclusion, and an average project duration of three years, concrete benefits can be expected by the middle of the current decade.

Following the success of 2009, a second series of cross-thematic calls, with a total EC contribution of EUR 334.5 million, is launched in July 2010 by the FP7 Themes involved, as detailed in the Work Programme 2011.



Factories of the Future

Factories of the Future (FoF) is a EUR 1.2 billion programme in which the European Commission and industry are collaborating in research to support the development and innovation of new enabling technologies for the EU manufacturing sector.

The Factories of the Future initiative is helping EU manufacturing enterprises, especially SMEs, to adapt to global competitive pressures by improving the technological base of EU manufacturing systems.

Before the crisis, manufacturing represented approximately 21% of the EU's GDP and 20% of its employment, providing more than 30 million jobs in 230 000 enterprises, mostly SMEs. Moreover, each job in industry is considered to be linked to two more in related services. European manufacturing is also a dominant element in international trade, leading the world in areas such as automotive, machinery and agricultural engineering.

However, already threatened by both the lower-wage economies and other high-tech rivals, the situation of EU companies was made even more difficult by the downturn. The output of many manufacturing sectors experienced the sharpest decline in decades, with production declining by 20% in 2009, resulting in a significant rise in unemployment.

Value through technology and innovation

Restoring growth and achieving sustainability require a strategic shift in Europe from cost-based competition to an approach based on the creation of high added value. There is also an increasing demand for greener, more customised and higher quality products. Manufacturing needs to address the challenge of producing more, while consuming less material, using less energy and creating less waste.

ICT-enabled intelligent machines will be a major driver in improving processes, raising productivity and simplifying operation to allow greater involvement of SMEs. In addition, competitiveness implies the flexibility to adapt to fast-changing market demands in terms of products and volumes, also making factories safer, more attractive places to work.

Support to research and innovation through this PPP will ensure that the knowledge beginning to emerge in the middle of this decade will be translated into new technologies and processes that can be exploited in the European Factories of the Future.

Very positive outcomes

FoF involves financial support from the NMP (Nanotechnologies, Materials and Production technologies) and ICT (Information and Communication Technologies) Themes of FP7.

In overall terms, the EUR 95 million first FoF Call for Proposals launched in July 2009 proved very successful in meeting the PPP objectives. The 98 responding consortia included partners from 25 countries. With a success rate of 26%, the 25 proposals retained for funding cover the areas of adaptive control systems, small-series production, scalable micro-nano manufacturing platforms and smart factories. Industry receives around 54% of the funding allocated to the selected projects, with SMEs representing 32% of the funds.

Strategy through dialogue

The dialogue in the framework of the Ad-hoc Industrial Advisory Group for the FoF PPP produced in January 2010 the FoF Multi-annual Roadmap until 2013, which identifies the following strategic sub-domains:

- **Sustainable manufacturing** – a new eco-factory model and the manufacturing of green products, taking into account sustainability along the axes of environmental friendliness, economic growth, and social well-being.
- **ICT-enabled intelligent manufacturing** – smart factories: agile manufacturing and customisation; virtual factories: value creation in global networked manufacturing and logistics; and digital factories: manufacturing design and product life cycle management.
- **High performance manufacturing** – adaptive production equipment; systems for rapid (re)configurations and optimal energy use; high precision machines and systems; and zero-defect manufacturing approaches.
- **Exploiting new materials through manufacturing** – net-shape manufacturing for advanced structural and functional materials; new material functionalities through manufacturing processes; manufacturing strategies for renovation and repair; product design based on sustainable material processing technologies.

The Multi-annual Roadmap has already been taken into account when defining the research topics in the FoF Calls included in WP2011, which are shown in the table on the facing page.



FoF CROSS-THEMATIC CALL IN JULY 2010

FP7 Theme	Topic	Funding scheme	Budget (M€)	Deadline
NMP	FoF.NMP.2011-1 The eco-factory: cleaner and more resource-efficient production in manufacturing	Collaborative Projects	80	2 Dec 2010
	FoF.NMP.2011-2 Cooperative machines and open architecture control systems			
	FoF.NMP.2011-3 Robots for automation of post-production and other auxiliary processes			
	FoF.NMP.2011-4 High-tech solutions in the production processes for customised healthy, green and safe consumer products			
	FoF.NMP.2011-5 Towards zero-defect manufacturing			
	FoF.NMP.2011-6 Manufacturing chains for nano-phased component and coatings			
ICT	FoF-ICT-2011.7.3 Virtual Factories and enterprises	Collaborative Projects	80	
	FoF-ICT-2011.7.4 Digital factories: Manufacturing design and product lifecycle management			
	FoF-ICT-2011.7.4 Digital factories: Manufacturing design and product lifecycle management	CSA		

Note: This information is only indicative as the calls of WP2011 had not yet been published at the time of preparation of this brochure. Full details on topic content and specific type of funding scheme are provided in WP2011.

Energy-efficient Buildings

The Energy-efficient Buildings (EeB) PPP provides a financial envelope of EUR 1 billion to boost the construction sector by researching methods and technologies to slash the energy consumption and CO₂ emissions of new and renovated buildings.

The construction sector accounts for 16.4 million jobs or 30% of industrial employment in the EU. Its close to 3 million enterprises, 95% of which are SMEs, generate about 10% of the EU's GDP.

At the same time, construction is a major contributor to the emission of Greenhouse Gases (GHG). At present, building activities, together with the transport of building materials and products, account for around 40% of all energy consumption in Europe – giving rise to 36% of the CO₂ emissions. In March 2007, the European Council set clear goals for 2020: increase energy efficiency to achieve a reduction of 20% of total energy use (below 2005 levels); 20% contribution of renewable energies to total energy use; and 20% reduction of GHG below 1990 emissions.

Broad aims include retrofitting

The current stock of residential and commercial buildings in the EU amounts to around 160 million. Even before the crisis, new construction was adding less than 2% per year in all major European countries. These figures would push the horizon for a truly energy-efficient built environment far beyond one century, unless there is a strong focus on the renovation of existing buildings.

To optimise building and district concepts taking into account local specificities, the EeB PPP devotes specific attention to the development and integration of design and simulation tools, new materials, building systems and equipment and ICT for energy efficiency.

Success achieved

EeB involves financial support from the NMP (Nanotechnologies, Materials and Production technologies), ICT (Information and Communication Technologies), Energy, and Environment (including Climate Change) Themes of FP7.

The first EeB Call for Proposals launched in July 2009 for a total of EUR 65 million proved very successful in meeting the PPP objectives. The 60 proposals received involved partners from 24 countries. Industry receives around 48% of the funding allocated to the selected projects, with SMEs representing 30% of the funds. With a success rate of 28%, the 17 proposals retained for funding cover the areas of nanotechnology-based insulation systems, energy efficiency at district level and for buildings and spaces of public use, and the retrofitting of buildings, in particular those in our cultural heritage.

Strategy built in partnership

The Ad-hoc Industrial Advisory Group of the EeB PPP, following a wide stakeholders' consultation, presented in January 2010 the EeB Multi-annual Roadmap, which identifies the following strategic subdomains:

- **Energy-efficient refurbishment of existing buildings** – insulation or integrated low-carbon systems to reduce thermal energy demand and increase renewable energy production; compatible renovation of historical buildings.
- **Neutral/energy-positive new buildings** – efficient, robust and cost-effective solutions to improve energy performance; photovoltaics for renewable energy production; novel contracting models that take into account the positive balance in energy management.
- **Energy-efficient districts/communities** – addressing the difference in dynamics of energy supply and demand; re-orientation from centralised to local control of buildings; coupling of centralised and decentralised systems; 'low-exergy' systems to minimise temperature differences; new markets and energy-related services.
- **Horizontal technological aspects** – adaptable and intuitive energy management systems; building materials with low embedded energy, components and systems to maximise the usage of local renewable energy; robust wireless sensors and actuators; supply/demand balance monitoring; simulation tools.
- **Horizontal organisational aspects** – adaptation of products, systems and technologies to combine user requirements with better energy efficiency; standardisation methodologies and models.

The priorities in this Multi-annual Roadmap have already been considered in the definition of the research topics included in the EeB Call in WP 2011, which are shown in the table in the facing page.



EeB CROSS THEMATIC CALL IN JULY 2010

FP7 Theme	Topic	Funding scheme	Budget (M€)	Deadline
NMP	EeB.NMP.2011-1 Materials for new energy-efficient building components with reduced embodied energy	Collaborative Projects	39	2 Dec 2010
	EeB.NMP.2011-2 New efficient solutions for energy generation, storage and use related to space heating and domestic water in existing buildings			
	EeB.NMP.2011-3 Energy-saving technologies for buildings envelope retrofiting			
	EeB.NMP.2011-4 Geo-cluster approach to support European energy-efficiency goals	CSA	1	
Environment (including Climate Change)	EeB.ENV.2011.3.1.5-1 Technologies for ensuring, monitoring and/or controlling a high quality indoor environment (including comfort, health, safety, accessibility and positive stimulation) in relation to energy-efficient buildings in particular	Collaborative Projects	5	
	EeB.ENV.2011.3.1.5-2 Operational guidance for life cycle assessment studies of the Energy-efficient Buildings initiative	CSA	0.5	
Energy	EeB.ENERGY.2011-1 Demonstration of very low energy new buildings	Collaborative Projects	20	
ICT	EeB.ICT.2011.6-4 ICT for energy-efficient buildings and spaces of public use	Collaborative Projects	19	
	EeB.ICT.2011.6-4 ICT for energy-efficient buildings and spaces of public use	CSA	1	

Note: This information is only indicative as the calls of WP2011 had not yet been published at the time of preparation of this brochure. Full details on topic content and specific type of funding scheme are provided in WP2011.

Green Cars

The scope of the European Green Cars Initiative is broader than that of the other two PPPs. It not only includes EUR 1 billion for research, but also a substantial package of financial and demand-side measures to support the development of new and sustainable forms of road transport, with a total funding of EUR 5 billion.

Prior to the crisis, road transport generated 11 % of the EU's GDP and contributed EUR 33 billion of external trade. The automotive industry directly employed 2.3 million people, plus over 12 million indirectly. However, as a result of the current economic downturn, total vehicle production (cars, trucks and buses) has decreased in 2009 by 23 % compared with the level of 2007.

'Greening' is necessary to achieve EU and world targets for emission reductions. Road transport is responsible for around 20 % of Greenhouse Gas emissions and 30 % of CO₂ emissions in the EU. While overall emissions have declined, those from road transport rose continuously between 1990 and 2005 due to high growth in both passenger (28 %) and freight transport (62 %).

Range of measures

A broad field of research and innovation is covered, embracing not only passenger cars, but also commercial and public transport vehicles, alternative fuels and the optimisation of infrastructure and logistics.

In addition, the initiative adopts a wider range of actions, comprising:

- Research and technological development, with EUR 1 billion shared between FP7, Member States and private investment.
- Support to industrial research and innovation through EIB loans of up to EUR 4 billion.
- Public procurement and other demand-side measures, such as scrapping schemes and the reduction of circulation and registration taxes for low-CO₂ vehicles.

A new European Clean Transport Facility (ECTF) was created as a further direct response to the crisis. The ECTF is aimed specifically at transport research, development and innovation, with the goal of lowering emissions and improving energy-efficiency – not only in road transport, but also other modes such as rail, and inland and maritime navigation.

Successful cross-thematic support

The PPP receives financial support from the Sustainable Surface Transport, NMP (Nanotechnologies, Materials and Production technologies), ICT, Environment (including climate change), and Energy Themes of FP7.

The response to the first Calls, budgeted at EUR 108 million, amounted to 94 proposals with partners from 24 countries. Around 54 % of the funding is allocated to industry, with SMEs accounting for 16 % of the funds. With a success rate of 33 %, the 31 retained proposals will conduct research into the electrification of road transport, hybrid technologies, and electric batteries (addressed by a Joint Call).

Evolving priorities

The dialogue between the Commission and the industry stakeholders in an Ad-hoc Industrial Advisory Group resulted in a European Roadmap on the Electrification of Road Transport issued in October 2009. The priorities identified include:

- **Energy storage systems** – battery design, materials and management; Li battery recycling; post-Li technologies; bi-directional charging; battery loan programme.
- **Drive train technologies** – low-cost, lightweight motors and electronics, motor controls, optimised internal combustion engines for range extenders; integrated range extender system.
- **System integration** – optimisation of system efficiency; new solutions for heating venting, cooling; electrical architecture and interconnects; concepts for space usage; lightweight materials and design.
- **Grid integration** – adaptive on-board/in-plug charging; contactless charging; bi-directional charging; vehicle-to-grid communication; charging infrastructure development and management.
- **Safety** – integrated safety; crashworthiness of lightweight cars; acoustic perception; interaction with infrastructure; standardisation.
- **Transport system integration** – intelligent transport systems; intermodal transition; autonomous driving systems; signage of roads and vehicles; stimulation of rapid uptake.

A more comprehensive consolidated roadmap has been prepared for July 2010. This has already provided input to the identification of research topics included in WP2011, which are shown on the following page.



GC CROSS-THEMATIC CALLS IN JULY 2010

FP7 Theme	Topic	Funding scheme	Budget (M€)	Deadline
Joint Call NMP, Environment, Transport	GC.NMP.2011-1 – GC.ENV.2011-3.1.3-1 – GC.SST.2011-7.8 Advanced eco-design and manufacturing processes for batteries and electrical components	Collaborative Projects	25.5	2 Dec 2010
	GC.ENV.2011-3.1.3-2 Operational guidance for Life Cycle Assessment studies of the European Green Cars Initiative	CSA		
Transport	GC.SST.2011.7-1 Specific safety issues of electric vehicles	Collaborative Projects	33.5	
	GC.SST.2011.7-2 Integrated thermal management			
	GC.SST.2011.7-3 Efficient long distance transport – future power train concepts (includes: advanced combustion and after-treatment)			
	GC.SST.2011.7-4 Efficient long distance transport – waste heat recovery			
	GC.SST.2011.7-5 Urban – interurban shipments			
	GC.SST.2011.7-6 Integrated intermodal traveller services			
	GC.SST.2011.7-7 Capability of improving and exploiting capacity	CSA		
	GC.SST.2011.7-9 ERA-Net Plus 'Electromobility'	Collaborative Projects		
	GC.SST.2011.7-10 Architectures of Light Duty Vehicles for urban freight transport			
GC.SST.2011.7-11 Green corridors and supply chain management				
ICT	GC-ICT-2011.6.8 ICT for fully electric vehicles	Collaborative Projects	30	
	GC-ICT-2011.6.8 ICT for fully electric vehicles	CSA		

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Further information

General

- FP7 Research Themes and Call information
<http://cordis.europa.eu>
- Information on the research PPPs, including the multi-annual roadmaps for FoF and EeB
http://ec.europa.eu/research/industrial_technologies/
- Joint Statement on the 3 PPPs and press package of March 2009
<http://ec.europa.eu/research/index.cfm?pg=newsalert&lg=en&year=2009&na=ppp-310309>
- Conference 'From Economic Recovery to Sustainability' (Valencia, April 2010) focused on the PPPs
www.r2sconference.eu
- Risk-Sharing Finance Facility
www.eib.org/products/loans/special/rsff/?lang=en

Industry websites

Factories of the Future

- European Factories of the Future Research Association (EFFRA)
www.effra.eu
- Manufacture Technology Platform
www.manufacture.org

Energy-efficient Buildings

- Energy-Efficient Buildings Association (E2BA)
www.e2b-ei.eu
- European Construction Technology Platform
www.ectp.org

Green Cars

- ERTRAC – Road Transport Technology Platform
www.ertrac.org
- EPoSS – European Technology Platform on Smart Systems Integration
www.smart-systems-integration.org
- SmartGrids – European Technology Platform for the Electricity Networks of the Future
www.smartgrids.eu

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EUR 24365 – **New public-private partnerships for research in the manufacturing, construction and automotive sectors. European PPP research supports economic recovery. Progress Report: July 2010**

Luxembourg: Publications Office of the European Union

2010 — 12 pp. — 17.6 x 25 cm

ISBN 978-92-79-15787-5

doi: 10.2777/50346

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