



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

European PPP research  
supports economic recovery  
Progress Report: July 2011

EUROPEAN COMMISSION

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European Commission

**EUR 24823 — New public-private partnerships for research in the manufacturing, construction and automotive sectors. European PPP research supports economic recovery Progress Report: July 2011**

Luxembourg: Publications Office of the European Union

2011 — 12 pp. — 17.6 x 25 cm

ISBN 978-92-79-20298-8

doi 10.2777/58552

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

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Luxembourg: Publications Office of the European Union, 2011

ISBN 978-92-79-20298-8

doi 10.2777/58552

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*Printed in Belgium*

PRINTED ON ELEMENTAL CHLORINE-FREE BLEACHED PAPER (ECF)

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# Boosting innovation in key European industries

As part of its European Economic Recovery Plan, adopted in November 2008 to tackle the global economic downturn that badly affected key sectors of European industry, in early 2009 the European Commission launched three public-private partnerships (PPPs). These PPPs were designed to fund research and innovation in the manufacturing, construction and automotive sectors to boost competitiveness and increase employment. Progress over the past year shows the scheme is having a positive effect in manufacturing and in the automotive industry and is starting to boost energy efficiency in construction.

Working closely with industry, the European Commission proposed research actions to develop new technologies and promote the rapid conversion of the results into marketable innovations. At the same time they encourage active participation by small and medium-sized enterprises (SMEs).

Three partnerships have been implemented:

- in the manufacturing sector, a EUR 1.2 billion **'Factories of the Future (FoF)'** PPP initiative to promote the competitiveness and sustainability of European manufacturing industry;
- in the construction sector, a EUR 1 billion **'Energy-efficient Buildings (EeB)'** PPP initiative to promote green technologies and the development of energy-efficient systems and materials in new and renovated buildings to radically reduce their energy consumption and CO<sub>2</sub> emissions; and
- in the automotive sector, a EUR 5 billion **'Green Cars (GC)'** PPP initiative to improve the sustainability of all European road transport and accelerate the move towards electrification of road and urban transport. The budget includes a EUR 4 billion loan facility for research and support measures from the European Investment Bank (EIB) under its European Clean Transport Facility (ECTF).

With relatively similar objectives, 'Future Internet', a new PPP devoted to information and communications technology (ICT), was officially launched in May 2011.

## Long-term approach

These initiatives are helping secure the long-term future of a knowledge-based and low-carbon EU economy, as underlined in March 2010 in the Commission Communication 'Europe 2020: A strategy for smart, sustainable and inclusive growth'. In the near future PPPs are expected to play a strategic role in at least three of the seven EU 2020 flagship initiatives – Innovation Union, Resource-efficient Europe and Industrial Policy. The Innovation Partnerships, newly proposed frameworks to facilitate innovation, will also build on initiatives such as these PPPs.

The overall EUR 3.2 billion research budgets of the three research PPPs in the Recovery Plan are based on matched funding from the Seventh Framework Programme (FP7) and the private sector. The PPPs use the current FP7 funding schemes and the calls are published annually.

In addition, the Risk-Sharing Finance Facility (RSFF), a loan facility for investment in research and technological development (RTD) and innovation set up with the EIB under FP7 – as well as the measures supported under the ECTF for the Green Car PPP – has enabled companies to secure funds to take concepts to the market. Total RSFF lending in 2010 provided by the EIB and supported by the European Commission amounted to EUR 1.84 million.

## Engaging industry

To achieve a fast start-up, in July 2009 the PPPs already launched the first cross-thematic Calls for Proposals under FP7. In parallel, exploration of a strategy for the longer term was also undertaken. To structure the dialogue between the public and private sides of the PPPs, the European 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.

Following wide-ranging cross-sectoral consultations of the stakeholders, multi-annual roadmaps were published in January 2010 for the FoF and EeB PPPs. A similar roadmap was published for the GC initiative in early 2011. These roadmaps help prepare the annual Work Programmes for the PPP Calls for Proposals within FP7.

The manufacturing and construction sectors have set up dedicated non-profit associations – the European Factories of the Future Association (EFFRA) and the Energy-efficient Buildings Association (E2BA) – to facilitate liaison with the EU Commission in developing the PPPs.

## Building on success

The results from the first two years of the PPP Calls for Proposals show that these initiatives hold many advantages for industry, notably a strong SME presence, shorter grant approval and negotiation times, more industry-led projects and a predefined PPP budget. In this way, the PPPs encourage increased industrial investment in research and help EU industry respond to current and future competitive challenges.

An important advantage is the pursuit of more industrially-relevant projects based upon clearly defined industrial needs. The Multi-annual Roadmaps provide information on the priorities to be supported over the coming years and

would offer greater scale and impact. The PPPs also enable industry to address major challenges, develop enabling solutions and turn these solutions into business opportunities.

### Positive assessment of the three PPPs

An interim assessment by an Expert Group, published in May 2011, is quite supportive of the three PPPs, which are seen as a useful approach to organising research and innovation with direct industrial utility. All the PPPs are found to have been successful in engaging top industrial companies, SMEs and research organisations within Europe, significantly increasing large industry and SME participation.

The implementation of the PPPs has been achieved using flexible ad-hoc arrangements. These have enabled a faster start-up and more rapid approach than with Joint Technology Initiatives, which require a Joint Undertaking. The PPPs have also facilitated a closer working relationship between the European Commission and industry in setting objectives. This has allowed industry to commit to longer-term strategies for research investment.

Further efforts may be needed to sustain the efficiency of the Calls for Proposals as the PPPs annual budgets increase in the final year of FP7, as well as to further coordinate procedures across the various participating themes.

In the report, more innovation actions are also recommended to address near-market issues such as developing facilities to provide wide-scale demonstration of European added-value concepts. Dissemination should also be strengthened.

### Continuing dialogue

Both public and private sides support a continuing dialogue under FP7 through the Ad-hoc Industrial Advisory Groups. New articles with provisions dedicated to the PPPs in the Commission's proposal for the revision of the Financial Regulation are part of the plans to explore an improved model for research PPPs.

The third Calls for Proposals for these PPPs are going to be launched in July 2011. Through major efforts on all sides, negotiations of grant agreements for the projects selected under the second Call are being completed at good speed, to join those of the first generation, already running for several months. And with an average project duration of three years, concrete benefits can be expected by the middle of the current decade.



# Factories of the Future

The European Commission and industry are collaborating in the Factories of the Future (FoF) PPP to support the development of enabling technologies to foster innovation in the EU manufacturing sector, in particular by SMEs. The economic recovery in manufacturing is promising, with industrial confidence and the business outlook positive. Industrial output was already growing at the start of 2011, although still some 9% below its peak in early 2008.

Manufacturing played an important role in the European economy before the crisis, constituting 21% of the Union's GDP. Some 230 000 enterprises, many of them SMEs, directly provided more than 30 million jobs – some 20% of EU employment – with twice that number in related services. European manufacturing is also dominant in international trade, leading the world in areas such as car manufacture, machinery and agricultural engineering.

The global financial downturn hit manufacturing badly. The output of many sectors experienced the sharpest reduction in decades, with production declining by 20% in 2009, resulting in a significant rise in unemployment. However, the sectors initially most affected by the downturn are now showing some signs of recovery.

## Creating high added value

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.

The FoF initiative is helping EU manufacturers to adapt to global competitive pressures by improving their technological and knowledge base. The PPP is involved in the development and integration of enabling production technologies, including adaptable machines and industrial processes, ICT and advanced materials.

## Successful second Call

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

The second FoF Call for Proposals for EUR 160 million was launched in July 2010, building on the success of the first FoF Call. Some 193 proposals were submitted, of which 36 were retained for funding. The successful consortia included partners from 26 countries. Industry receives around 50% of the funding allocated to the selected projects, with SMEs receiving 29% of the total funds. Topics covered include the eco-factory, high-tech solutions in production processes, towards zero-defect manufacturing, and virtual factories and production.

## Strategy through dialogue

In January 2010, the FoF PPP Ad-hoc Industrial Advisory Group produced the Multi-annual Roadmap covering the period 2009-2013, which identified the following strategic sub-domains:

- sustainable manufacturing;
- ICT-enabled intelligent manufacturing;
- high performance manufacturing; and
- exploiting new materials through manufacturing.

The FoF Multi-annual Roadmap was taken into account when defining the research topics in the FoF Calls included in WP2012, shown in the table on the facing page.

## Long-term outlook

The impact of the FoF PPP was debated at a Brussels workshop in November 2010. The PPP was seen as having differentiated its approach from standard FP7 projects through the industrially driven nature of its topics. The challenge now is to build on this differentiation and to strengthen the impact with the help of a committed community.

Specific recommendations focused on actions that the various stakeholders, including the European Commission, the Ad-hoc Industrial Advisory Group, the European Factories of the Future Research Association (EFFRA) and the funded projects could take. They included:

- Community-building measures, such as annual meetings, to help provide an entry point for new participants, and an opportunity to influence the future of the PPP, exploring possible clustering activities.
- Undertaking benchmarking and socio-economic studies to identify and quantify the impact of funded projects.
- Improvements to the Roadmap, especially beyond 2013 – for example, by expanding the scope of activities, ensuring better justification for the inclusion of topics, and including the development of innovative integrated business models.



## FoF CROSS-THEMATIC CALL IN JULY 2011

FP7 Theme	Topic	Funding scheme	Budget (M€)	Deadline
NMP	FoF.NMP.2012-1 Adaptive production systems and measurement and control equipment for optimal energy consumption and near-to-zero emissions in manufacturing processes	Collaborative Projects (Large-scale project)	100	1 December 2011
	FoF.NMP.2012-2 Methodologies and tools for the sustainable, predictive maintenance of production equipment	SME-targeted collaborative projects		
	FoF.NMP.2012-3 Intelligent production machines and 'plug-and-produce' devices for the adaptive system integration of automation equipment, robots and other intelligent machines, peripheral devices, smart sensors and industrial IT systems			
	FoF.NMP.2012-4 High-performance manufacturing technologies in terms of efficiency (volumes, speed, process capability etc), robustness and accuracy	Collaborative Projects (DEMO-targeted project)		
	FoF.NMP.2012-5 High precision production technologies for high quality 3D micro-parts	Collaborative Projects (Small or medium-scale focused research project)		
	FoF.NMP.2012-6 Knowledge-based tools and approaches for process planning and integrated process simulation at factory level			
	FoF.NMP.2012-7 Innovative technologies for casting, material removing and forming processes	Collaborative Projects (DEMO-targeted project)		
ICT	FoF-ICT-2011.7.1 Smart Factories: Energy-aware, agile manufacturing and customisation	Collaborative Projects (IP and STREP)	60	
	FoF-ICT-2011.7.2 Manufacturing solutions for new ICT products	Collaborative projects (IP)		

Note: This information is only indicative as the calls of Work Programme 2012 had not yet been published at the time of preparing this brochure. Full details on topic content and specific type of funding scheme are provided in Work Programme 2012.

# Energy-efficient Buildings

The European Commission together with industry established the Energy-efficient Buildings (EeB) PPP to promote green technologies and the development of energy-efficient systems and materials to boost the construction sector and to reduce energy consumption and CO<sub>2</sub> emissions of new and renovated buildings.

Construction provides 16.4 million jobs in the EU, 30 % of industrial employment, in some 3 million enterprises of which 95 % are SMEs. It also generates about 10 % of EU GDP. In any case, the EU construction industry still remains in a difficult period, as a result of the crisis.

Construction is a major source of greenhouse gases (GHG) with building activities, together with the transport of building materials and products, accounting for around 40 % of all energy consumption in Europe, giving rise to 36 % of its CO<sub>2</sub> emissions.

The current EU stock of residential and commercial buildings is some 160 million. Even before the crisis, new construction was adding less than 2 % per year in all major European countries. This pushes the horizon for a truly energy-efficient built environment far beyond a 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 significant attention to the development and integration of design and simulation tools, new materials, buildings systems and equipment and ICT for energy efficiency.

## Successful call

The second EeB Call for Proposals, launched in July 2010 for a total of EUR 85,5 million, was highly successful, attracting twice as many proposals as for the first Call. Of the 120 proposals, 24 were funded, including partners from 26 countries. Industry obtained 53 % of the funding, with SMEs gaining 26 % of the total funds. Areas covered included new materials for energy-efficient building components, energy-saving technologies for the retrofitting of buildings, ICT for energy-efficient buildings and the demonstration of very low energy new buildings.

## Strategy built in partnership

In January 2010, the Ad-hoc Industrial Advisory Group presented the EeB Multi-annual Roadmap, which identified as series of strategic sub-domains:

- energy-efficient refurbishment of existing buildings;
- neutral/energy-positive new buildings;
- energy-efficient districts/communities;
- horizontal technological aspects; and
- horizontal organisational aspects.

The EeB Multi-annual Roadmap has helped focus stakeholders on a long-term common agenda that guarantees continuity and keeps industry keen to participate.

The priorities in the Multi-annual Roadmap were considered in the definition of the research topics included in the EeB Call in WP2012, shown in the table on the facing page.

## Enhancing collaboration

The EeB PPP also held a workshop in Brussels in November 2010 to investigate enhancing collaboration. First-hand evaluation of the process for the first two Calls showed a number of benefits compared with FP7. Moreover, the PPP provides a common framework with committed stakeholders and enables real multidisciplinary co-operation.

Some of the most direct impacts will be due to demonstrators that accelerate the take up of technologies by the market.

The PPP also encourages increased industrial investment in research and can help companies to access innovative concepts and tools, providing SMEs with opportunities for technology development.

Continuation of the PPP was seen at the workshop as fundamental to ensuring real impact with the addition of other supporting actions such as incentive schemes, large scale demonstration and the development of new types of collaborations.



## EeB CROSS-THEMATIC CALL IN JULY 2011

FP7 Theme	Topic	Funding scheme	Budget (M€)	Deadline
NMP	<b>EeB.NMP.2012-1</b> Interaction and integration between buildings, grids, heating and cooling networks, and energy storage and energy generation systems	Collaborative Projects (Large-scale project)	70	1 December 2011
	<b>EeB.NMP.2012-2</b> Systemic Approach for retrofitting existing buildings, including envelope upgrading, high performance lighting systems, energy-efficient HVAC systems and renewable energy generation systems			
	<b>EeB.NMP.2012-3</b> Development and validation of new 'processes and business models' for the next generation of performance based energy-efficient buildings integrating new services	SME-targeted collaborative projects		
	<b>EeB.NMP.2012-4</b> Nanotechnology based approaches to increase the performance of HVAC systems	Collaborative Projects (Small or medium-scale focused research project)		
	<b>EeB.NMP.2012-5</b> Novel materials for smart windows conceived as affordable multifunctional systems offering enhanced energy control			
	<b>EeB.NMP.2012-6</b> Methodologies for Knowledge transfer within the value chain and particularly to SMEs	Coordination and Support Actions (CSA)		
Environment (including Climate Change)	<b>EeB.ENV.2012.6.6-2</b> Concepts and solutions for improving energy efficiency of historic buildings, in particular at urban district scale	Collaborative Projects	5	
Energy	<b>EeB.Energy.2012.8.8.3</b> Demonstration of nearly Zero Energy Building Renovation for cities and districts	Collaborative Projects – Scale of Units (CP-SoU)	35	
ICT	<b>EeB-ICT-2011.6.5</b> ICT for energy-positive neighbourhoods	Collaborative projects (STREP)	30	

Note: This information is only indicative as the calls of Work Programme 2012 had not yet been published at the time of preparing this brochure. Full details on topic content and specific type of funding scheme are provided in Work Programme 2012.

# 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, giving a combined funding of EUR 5 billion.

The automotive industry is a key European industrial sector and accounts for close to 8% of total manufacturing value added and about 6% of total manufacturing employment with over two million jobs. It also provides indirect employment to over 10 million people and is one of the largest EU RTD investors, spending over EUR 20 billion annually – about 5% of the sector's turnover.

Road transport is responsible for 20% of greenhouse gas emissions and 30% of CO<sub>2</sub> emissions in the EU. While overall emissions have declined, those from road transport rose continuously between 1990 and 2005 as a result of high growth in both passenger (28%) and freight (62%) transport. A green approach is therefore essential to achieve EU and world targets for emissions reductions.

## Future benchmarks

Future goals include higher energy efficiency, decarbonisation of energy carriers used in transport, and an overall optimised performance of personal mobility and goods transport.

Meeting these ambitious objectives requires breakthrough developments in a wide variety of technology fields. Accelerated innovation will be based on joint agreements of the relevant economic sectors and the public authorities to ensure a competitive edge for Europe in the field of clean and energy-efficient vehicles.

## Second round results

The second round of Calls, included in Work Programme 2011, was published in July 2010 with an indicative budget of EUR 95,75 million. These PPP Calls involved support from the Transport, NMP, Energy, ICT and Environment themes.

The Calls covered the three major research areas:

- electric and hybrid vehicles;
- heavy duty vehicles based on internal combustion engines; and
- logistics and co-modality.

Out of 87 proposals received, 23 projects involving partners from 26 countries were selected for funding. This represents a slight drop as compared with the first Call, reflecting the slightly lower overall budget. Nevertheless, in the successful proposals, 60% of the funding was allocated to industry, with SMEs obtaining 18% of the total funds.

## Strategic Multi-annual Roadmap

In early 2011, the Ad-hoc Industrial Advisory Group published its Strategic Multi-annual Roadmap, defining the research and development objectives to be achieved by the PPP.

Group members are industry representatives from four European Technology Platforms: The European Road Transport Research Advisory Council (ERTRAC), the European Technology Platform on Smart Systems Integration (EPoSS), the European Technology Platform for the Electricity Networks of the Future (SmartGrids) and the European Intermodal Research Advisory Council (EIRAC).

The Multi-annual Roadmap comprises three pillars: electrification of road transport, long-distance transport, and logistics and co-modality. These three pillars represent the key areas to achieve energy efficiency improvements, CO<sub>2</sub> emissions reductions and reliable logistics and mobility. They also offer important opportunities for Europe to turn its outstanding knowledge base in the field of clean and energy efficient vehicles and transport solutions into innovations bringing substantial benefits both environmentally and socio-economically.

The Work Programme 2012 was able to take the strategic Multi-annual Roadmap into account, and the research topics included in the various Calls are shown on the following page.



## GC CROSS-THEMATIC CALLS IN JULY 2011

FP7 Theme	Topic	Funding scheme	Budget (M€)	Deadline
Joint Call NMP Environment Transport	GC.NMP.2012-1 Innovative automotive electrochemical storage applications based on nanotechnology	Collaborative Projects (Small or medium-scale focused research project)	10	1 December 2011
	GC.NMP.2012-2 / GC.SST.2012.1-1 / GC.ENV.2012-6.6.3 Innovative advanced lightweight materials for the next generation of environmentally-friendly electric vehicles	Collaborative Projects (Large-scale project)	25	
Transport	GC.SST.2012.1-2 Smart infrastructures and innovative services for electric vehicles in the urban grid and road environment	Collaborative projects	53	
	GC.SST.2012.1-3 European strategy for rare materials and their possible substitution	CSA		
	GC.SST.2012.1-4 Modelling and testing for improved safety of alternatively-powered vehicles	Collaborative projects		
	GC.SST.2012.1-5 Integration and optimization of range extenders on Electric Vehicles			
	GC.SST.2012.1-6 Advanced energy simulation and testing for Fully Electric Vehicles (FEV)			
	GC.SST.2012.1-7 Demonstration of Urban freight Electric Vehicles for clean city logistics			
	GC.SST.2012.2-1 Extreme low rolling resistance tyres	Collaborative projects		
	GC.SST.2012.2-2 Complete vehicle energy management			
	GC.SST.2012.2-3 Demonstration of heavy duty vehicles running with liquefied methane			
	GC.SST.2012.3-1 Towards sustainable interconnected logistics – development of standardised and modular solutions for freight transport vehicles, loading units and transshipment equipment			
	GC.SST.2012.3-2 Improve capturing and sharing of transport data in support of innovative freight transport schemes	Collaborative projects		
GC.SST.2012.3-3 Platform for continuous intermodal freight transport strategic research and innovation				
GC.SST.2012.3-4 Green hubs enabling co-modal network design	Collaborative projects			
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		

Note: This information is only indicative as the calls of Work Programme 2012 had not yet been published at the time of preparing this brochure. Full details on topic content and specific type of funding scheme are provided in Work Programme 2012.

# Further information

## General

- Public-private partnerships (PPPs) in research  
[http://ec.europa.eu/research/industrial\\_technologies/ppp-in-research\\_en.html](http://ec.europa.eu/research/industrial_technologies/ppp-in-research_en.html)
- FP7 Research Themes and Call information  
<http://cordis.europa.eu>
- Joint Statement on the three 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, Spain, April 2010) focused on the PPPs  
<http://www.r2sconference.eu>
- Risk-Sharing Finance Facility  
<http://www.eib.org/products/loans/special/rsff/?lang=en>
- Multi-annual Roadmap Factories of the Future  
[http://ec.europa.eu/research/industrial\\_technologies/pdf/ppp-factories-of-the-future-strategic-multiannual-roadmap-info-day\\_en.pdf](http://ec.europa.eu/research/industrial_technologies/pdf/ppp-factories-of-the-future-strategic-multiannual-roadmap-info-day_en.pdf)
- Multi-annual Roadmap Energy-efficient Buildings  
[http://ec.europa.eu/research/industrial\\_technologies/pdf/ppp-energy-efficient-building-strategic-multiannual-roadmap-info-day\\_en.pdf](http://ec.europa.eu/research/industrial_technologies/pdf/ppp-energy-efficient-building-strategic-multiannual-roadmap-info-day_en.pdf)
- Multi-annual Roadmap European Green Cars Initiative  
[http://www.green-cars-initiative.eu/public/documents/EGCI%20Roadmap.pdf/at\\_download/file](http://www.green-cars-initiative.eu/public/documents/EGCI%20Roadmap.pdf/at_download/file)
- Interim Assessment of the Research PPPs in the European Economic Recovery Plan  
[http://ec.europa.eu/research/industrial\\_technologies/useful-documents\\_en.html](http://ec.europa.eu/research/industrial_technologies/useful-documents_en.html)

## External websites

### Factories of the Future

- European Factories of the Future Research Association (EFFRA)  
<http://www.effra.eu>
- Manufuture Technology Platform  
<http://www.manufuture.org>

### Energy-efficient Buildings

- Energy-Efficient Buildings Association (E2BA)  
<http://www.e2b-jti.eu>
- European Construction Technology Platform  
<http://www.ectp.org>

### European Green Cars Initiative

- ECGI – European Green Cars Initiative  
<http://www.green-cars-initiative.eu>
- ERTRAC – Road Transport Technology Platform  
<http://www.ertrac.org>
- EPoSS – European Technology Platform on Smart Systems Integration  
<http://www.smart-systems-integration.org>
- SmartGrids – European Technology Platform for the Electricity Networks of the Future  
<http://www.smartgrids.eu>
- EIRAC – European Intermodal Research Advisory Council  
[www.eirac.eu](http://www.eirac.eu)

This brochure reviews the progress of the three research public-private partnerships (PPPs) established by the European Commission in 2009 in close collaboration with three key European industrial sectors – manufacturing, construction and automotive – hit particularly hard by the global economic downturn. It also outlines the Work Programme for the third Calls for Proposals for research projects in the relevant sectors, based on the strategic Multi-annual Roadmaps established for each sector. The industry-led approach to setting the priority objectives is ensuring a long-term continuity to these research programmes, which benefits industry both large and small across Europe, also contributing to the socio-economic goals established by the European Commission and Member State governments. These new research partnerships are contributing to renewed industrial growth in the European Union, with accompanying benefits in terms of employment and global competitiveness. In addition, the research results are set to support climate-change mitigation, energy savings and improved resource efficiency with global impact. Industry is keen to see the PPP approach continued, with more emphasis on bringing new technologies to the market.

