

Contractual public-private partnerships in Horizon 2020

for research and innovation in the manufacturing, construction, process industry and automotive sectors



EUROPEAN COMMISSION

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Introduction

The contractual Public-Private Partnerships (cPPPs) launched under Horizon 2020, the European Union's funding programme for Research and Innovation, are of strategic importance for the competitiveness and sustainability of European industry. These nine partnerships between the European Commission and an association of key stakeholders on the private side are funded by more than € 6 billion of investments allocated through calls for proposals under Horizon 2020. Each euro of public funding is expected to trigger additional investments of between € 3 and € 10 to develop new technologies, products and services which will give European industry a leading position on world markets.

The cPPPs have a legal basis in Article 25 of the regulation establishing Horizon 2020 and are implemented through a contractual arrangement between the European Commission and representative associations for key sectors of Europe's economy. The contractual arrangements for the cPPPs were signed on 17 December 2013 (except for the Big Data Value cPPP which was signed on 13 October 2014).

The cPPPs foresee a long-term commitment from the European Commission to support research and innovation in these key sectors and a long-term commitment from the private side to continue to invest and innovate, making use of the results generated in the EU projects supported in those partnerships. The contractual arrangements of the cPPPs commit the private side of each cPPP to a shared vision and quantifiable objectives. There are also clear commitments, key performance indicators and outputs to be delivered. Crucially, the involvement of industry ensures that the research and innovation planned meet industry's needs.

The cPPPs are based on multi-annual roadmaps for research and innovation activities which were produced by the private partners through a widely open consultation process. These roadmaps are used by the Commission as the basis to develop the successive Work Programmes and, specifically, the content of the calls for proposals. The cPPPs are implemented through normal calls for proposals under Horizon 2020 with the standard rules and procedures, which simplifies their implementation and the involvement of all stakeholders.

The call topics address, in particular, Key Enabling Technologies (KETs), which are designed to strengthen EU competitiveness, growth and jobs. Many topics include significant demonstration content to bring technologies closer to industrial exploitation.

This brochure presents the current status and the new opportunities in the 2016-17 Work Programme for each of the four cPPPs in Horizon 2020 for which DG Research and Innovation is the main supporter, which are:

- Factories of the Future (FoF), with indicative EU funding of € 1150 million:
- Energy-efficient Buildings (EeB), with indicative EU funding of € 600 million;
- European Green Vehicles Initiative (EGVI), with indicative EU funding of € 750 million;
- Sustainable Process Industry (SPIRE), with an indicative EU funding of € 900 million.

The first three are in fact building on the success of the corresponding research PPPs under the 7th Framework Programme (FP7) that were included in the European Economic Recovery Plan, launched by the Barroso Commission at the end of 2008.

A further € 3.3 billion of indicative EU funding has been allocated to five other cPPPs in the areas of Advanced 5G Network Infrastructure (5G), Robotics, Photonics, High Performance Computing and Big Data Value, for which the main supporter is DG Communications Networks, Content and Technology.

cPPPs in a wider context

Europe must strengthen its capacity to innovate so that companies maximise the value that they can extract from the excellent research taking place in projects such as those funded under these partnerships.

The cPPPs clearly address five of the 10 priority areas of the agenda for the new Juncker Commission (1):

- · to boost jobs, growth and investment;
- · to realise a connected digital single market;
- to implement a resilient Energy Union with a forward-looking climate change policy;
- to develop a deeper and fairer internal market with a strengthened industrial base; and
- to make Europe a stronger global actor.

⁽¹⁾ http://ec.europa.eu/priorities/docs/pg_en.pdf



A number of initiatives have been established to support these 10 priority areas. For instance, the € 315 billion European Fund for Strategic Investments (EFSI) recently launched by President Juncker will mobilise private finance to support strategic investments in key areas such as research and innovation. The EFSI will ensure that money reaches the real economy, to provide a renewed boost for jobs, growth and investment. Funding will be channelled to viable projects with a real added value for the European economy. Companies that have been participants in cPPP projects may also consider to apply for EFSI loans to help exploit the research results. The EFSI could, for example, support projects for energy efficiency retrofit in residential buildings using the technologies, materials and systems developed in research and innovation projects.

Carlos Moedas, the new Commissioner for Research, Science and Innovation, recently announced the new strategic priorities for the European research and innovation policy: Open Innovation, Open Science, and Openness to the World. The cPPPs will mainly contribute to the strategic priority of Open Innovation which will capitalise on research results and create a vibrant innovation system boosting private investment and maximising the impact of Horizon 2020.

Current status

A harmonised approach has been agreed for the implementation of all the cPPPs, with common rules of procedure for their Partnership Boards and common views regarding annual monitoring and Key Performing Indicators (KPIs). The Partnership Board is the main governance mechanism of a cPPP, where the dialogue between the European Commission and the private side provides key advice on research priorities for the definition of the periodic Work Programmes.

Call topics for each cPPP are published alongside other Horizon 2020 call topics. Under the cPPPs approach, the content of each topic is prepared by the European Commission following consultation with industry and other stakeholders. The cPPP call topics are a way to identify research projects that will help, in particular, to master and deploy the KETs, thus reinforcing Europe's leadership position in strategic industrial sectors and driving competitiveness and growth opportunities. The partnerships also offer funding for innovation-relevant actions, such as demonstration projects designed to test a working prototype or model. This completes the virtuous

circle, ensuring that research results have a faster and more direct path to the marketplace.

The first annual cPPP monitoring exercises were finalised during the summer of 2015. These show that the participation of industry in the first Horizon 2020 cPPPs calls in 2014 and 2015 further increased with respect to the average of 50 % achieved in the research PPPs calls within the FP7 Cooperation part, which had itself an average of 36 %. In fact, industrial participation has reached 57 % for EeB, 62 % for FoF, 60 % for SPIRE and 54 % for EGVI (the latter only corresponding to the 2014 call).

The participation of SMEs has also shown a significant increase in the Horizon 2020 calls for 2014 and 2015. The SME participation in FoF, EeB and Green Cars in FP7 was respectively 31 %, 28 % and 19 % (compared to an average 17 % in FP7 Cooperation). In the first calls of Horizon 2020, the participation of SMEs further increased for FoF reaching a share of 34 % in 2014 and of 38 % in 2015, while it was around 30 % for EeB and SPIRE in these two years and was 20 % for EGVI in 2014.

The cPPP calls have been successful in staying open to all stakeholders, with typically more than 70 % of the EU funding going to participants outside of the private side associations.

The first Horizon 2020 calls for the EeB, FoF, EGVI and SPIRE cPPPs in 2014 and 2015 had a strong emphasis on demonstrations and higher Technology Readiness Levels (TRLs) to move closer to the market.

For FoF, EeB and SPIRE, 64 proposals were retained for funding in 2014 and had their grant agreements signed before the end of 2014, while the 17 EGVI projects, which had dead-lines after the summer 2014, were signed before June 2015.

In 2015, FoF, EeB and SPIRE had their call deadlines on 4 February and nearly all of the grant agreements for the 60 proposals selected for funding had been signed by the end of summer 2015. EGVI has its call deadline on 15 October 2015.



Factories of the Future

Manufacturing plays a central role in the European economy. It is worth € 7 trillion in turnover and provides 30 million direct jobs, plus twice that number of indirect jobs, the vast majority in small or medium-sized enterprises (SMEs). It also generates 80 % of total EU exports. For example, the EU is the world's leading producer of mechanical engineering equipment, with a global market share of 37 %.

To safeguard this strong position and stimulate Europe's re-industrialisation, its manufacturing industry must evolve in line with market expectations, embracing the increased demand for high-quality products and customisation. It also needs to take environmental sustainability into account, ensuring that European companies can produce an increased amount of better products while using scarce resources more efficiently and generating less waste.

The Factories of the Future cPPP

The FoF cPPP constitutes a broad cross-sector public-private partnership between the European Commission and the European Factories of the Future Research Association (EFFRA), which aims to increase the competitiveness and sustainability of advanced manufacturing in Europe. Particular attention is placed on the involvement of SMEs. The overall goal is to promote a new production paradigm based on distributed, agile, smart and sustainable manufacturing systems enabled by Information and Communication Technologies (ICT). In this way the FoF cPPP aims to support the Europe 2020 target of a smart, green and inclusive economy and the EU industrial policy target of a 20% share of the EU GDP from manufacturing by 2020.

This objective should be achieved through developing innovative, sustainable and competitive manufacturing technologies in the domains of high-tech manufacturing processes and systems, adaptive and smart eco-friendly manufacturing equipment, intelligent and holistic processes, collaborative and modern enterprises, human-centred manufacturing and customer-focused manufacturing.

The private side committed itself to engage the stakeholders community to complement the \in 1.15 billion of funding for FoF with private investment of 5 to 10 times that level in addition to its in-kind contribution to the FoF projects under Horizon 2020.

Progress of the FoF cPPP

The FoF cPPP has been successful in identifying strategic paths for European manufacturing research and innovation, generating relevant projects that involve an increasing number of industrial companies in their activities, with a particular focus on SMEs, and are strongly oriented towards maximising the industrial impact of research results.

The FoF cPPP projects are generating significant results that in turn are contributing to the transformation of manufacturing into a more human-centred and environmentally-friendly sector, while ensuring global competitiveness.

In the four FP7 calls for proposals under the FoF PPP, 851 proposals were submitted, of which 151 were successful, receiving a total EU contribution of \in 665 million. These projects include more than 1 600 participations, with strong involvement by industrial (52 %) and more specifically SME (30 %) partners.

For the two Horizon 2020 calls in 2014 and 2015, 580 proposals were submitted of which 57 have been selected for implementation, receiving a total EU contribution of \in 263 million. The selected proposals include 702 participations, with an industrial involvement of 60 % and with 36 % of SME partners.

Priorities in the Calls

In line with the overall FoF cPPP strategy, Horizon 2020 calls continue to focus on the re-industrialisation of the EU through improved competitiveness and sustainability of manufacturing in Europe. The FoF cPPP is receiving its support from the LEIT-NMBP and LEIT-ICT parts of Horizon 2020.

The priorities for the period 2014-15 included energy and resource efficiency in manufacturing, including end-of-life issues, attractive work environments, de-manufacturing technologies, mass customisation and personalised manufacturing, increased flexibility in manufacturing capacity, and enhanced process optimisation/modelling/simulation and ICT for SME manufacturing environments.

The priorities for the period 2016-2017 include hybrid approaches for additive and subtractive manufacturing, zero-defect strategies, advanced surface manufacturing processes, micro-/nano-enabled high-volume manufacturing, digital automation, surface manufacturing, novel design and predictive maintenance, and life cycle management for reconfigurable and reusable customised products.

The estimated EU funding for the FoF cPPP calls in the next work programme is \in 160 million for 2016 and \in 118 million for 2017.



Topic code	Topic title	Type of Action	Expected deadline	Budget (M€)
FoF 01-2016	Novel hybrid approaches for additive and subtractive manufacturing machines	RIA	21 January 2016	77
FoF 02-2016	Machinery and robot systems in dynamic shop floor environments using novel embedded cognitive functions	IA		
FoF 03-2016	Zero-defect strategies at system level for multi-stage manufacturing in production lines	IA		
FoF 04-2016	Continuous adaptation of work environments with changing levels of automation in evolving production systems	RIA		
FoF 05-2016	Support for the further development of Additive Manufacturing technologies in Europe	CSA		
FoF 11-2016	Digital automation	RIA & CSA		53
FoF-13-2016	Photonics Laser-based production	RIA & IA		30
FoF 06-2017	New product functionalities through advanced surface manufacturing processes for mass production	RIA	19 January 2017	
FoF 07-2017	Integration of unconventional technologies for multi-material processing into manufacturing systems	RIA		85
FoF 08-2017	In-line measurement and control for micro-/nano-enabled high-volume manufacturing for enhanced reliability	IA		
FoF 09-2017	Novel design and predictive maintenance technologies for increased operating life of production systems	IA		
FoF 10-2017	New technologies and life cycle management for reconfigurable and reusable customised products	IA		
FoF-12-2017	ICT Innovation for Manufacturing SMEs (I4MS)	IA & CSA		33

FoF: Factories of the Future Call

Energy-efficient Buildings

Construction is Europe's largest single economic activity and its biggest employer. Europe's construction sector and its supporting industries contribute about 10 % of the EU's GDP and provide over 10 million direct jobs. The construction sector also has a crucial impact on the EU environment and energy policies as buildings use 40 % of total EU energy consumption and are responsible for 36 % of greenhouse gases in Europe while the replacement rate of the existing stock is very small (1-2 % per year).

The objective of the EeB cPPP is to drive the creation of a hightech building industry that turns energy efficiency into a sustainable business, fostering EU competitiveness in the construction sector at the global level. It also aims at promoting innovative technologies, systems and materials to achieve higher levels of energy efficiency in Europe's built environment.

The Energy-efficient Buildings cPPP

The EeB cPPP is a public-private partnership between the European Commission and the Energy-Efficient Buildings Association (E2BA), an initiative of the European Construction Technology Platform.

The EeB cPPP aims to create and integrate technologies and solutions to reduce energy consumption and greenhouse gases emissions in line with the Europe 2020 goals:

- to turn the building industry into a knowledge-driven sustainable business, with higher productivity and more highly-skilled employees;
- and to develop innovative and smart systemic approaches for green buildings and districts, helping to improve the competitiveness of the EU building industry.

The specific objectives defined in the EeB roadmap target the development of at least 40 new technologies across four areas: innovative construction, retrofitting, interactive sustainable buildings, and performance monitoring tools.

The private side committed itself to engage the stakeholders community to complement the € 600 million of funding for EeB with private investment of at least 4 times that level in addition to its in-kind contribution to the EeB projects under Horizon 2020.

Progress of the EeB cPPP

The four cross-thematic EeB calls in FP7 attracted 498 project proposals, of which 114 were successful – representing a combined EU investment of \in 547.5 million. The proportion of industrial partners, including SMEs, among the 1 480 participations was considerably higher (54 %) than the FP7 Cooperation average. The wide variety of projects reflected the range of innovations required to improve the energy efficiency of European buildings, with subjects such as nanotechnology-based HVAC systems, near-zero-energy buildings, and renovation and retrofitting of energy solutions for cities and districts.

So far, there have been two EeB PPP calls in Horizon 2020, in 2014 and 2015. A total of 311 proposals were submitted, of which 31 have been selected for implementation, receiving a total EU contribution of \in 137.6 million. They include 321 participations, with industrial involvement of 56 % and with 30.5 % of SME partners.

Priorities in the Calls

The Horizon 2020 EeB cPPP projects will provide continuity for the ongoing FP7 projects, some of which will run until 2017. The EeB cPPP will get its main support from the LEIT-NMBP part of Horizon 2020, with contributions as well from the Energy and Environment Challenges.

The priorities for the period 2014-15 included areas such as the building envelope, integrated design, sustainable materials, performance monitoring, and thermal storage.

The topics proposed for 2016-17 cover priority areas such as highly efficient insulation materials, energy-efficiency and environmental quality, re-use and recycling of construction materials and structures to produce prefabricated elements, near-zero-energy building renovation, highly efficient hybrid storage solutions for power and heat supply, and adaptable refurbishment solutions.

The estimated EU funding for the EeB cPPP calls in the next Work Programme is \in 57 million for 2016 and \in 62 million for 2017.



Call topics planned for 2016 and 2017 under the EeB cPPP				
Topic code	Topic title	Type of Action	Expected Deadline	Budget (M€)
EeB 1 -2016	Highly efficient insulation materials with improved properties	IA		49
EeB 2 -2016	Performance indicators and monitoring techniques for energy-efficiency and environmental quality at building and district level	CSA	21 January 2016	
EeB 3 -2016	Integration of advanced technologies for heating and cooling at building and district level	IA		
EeB 4 -2016	New technologies and strategies for the development of pre-fabricated elements through the reuse and recycling of construction materials and structures	RIA		
EE 10 - 2016	Supporting accelerated and cost-effective deep renovation of buildings	IA		8
EeB 5 -2017	Development of near zero energy building renovation	IA	19 January 2017	54
EeB 6 -2017	Highly efficient hybrid storage solutions for power and heat in residential buildings and district areas, balancing the supply and demand conditions	RIA		
EeB 7 -2017	Integration of energy harvesting at building and district level	IA		
EeB 8 -2017	New business models for energy-efficient buildings through adaptable refurbishment solutions	CSA		
EE 12 – 2017	Integration of Demand Response in Energy Management Systems while ensuring interoperability	IA		8

EeB: Energy-efficient Buildings Call; EE: Energy-Efficiency Call

European Green Vehicles Initiative

European Road transport, which produces about 20~% of the EU's CO_2 emissions and up to 41~% of air pollutants such as $NO_{x'}$, accounts for a large share of Europe's oil consumption and air quality problems. It is therefore a sector that could make a key contribution to greater sustainability. By promoting research and innovation that focuses on energy-efficient vehicles and alternative power-trains, the European Green Vehicles Initiative (EGVI) is accelerating the transition to greener road transport. It is also helping to keep Europe's automotive industry ahead of the competition.

The EGVI cPPP in Horizon 2020 supports the ambitions of the automotive industry. It foresees a critical mass of funding and cross-sectoral expertise, and represents a new step in the collaborative process established by its predecessor in FP7, the Green Cars research PPP.

The EGVI strategy

The general objective, as set out in the EGVI multi-annual roadmap is to increase the energy efficiency of vehicles and advance the development of alternative power-trains. The scope encompasses passenger cars as well as two-wheelers, trucks and buses, and potential new light-vehicle concepts. At least 40 innovative technologies are expected to be integrated and demonstrated, with an emphasis on electrification (electricity storage, electric components and vehicle infrastructure interface) and hybridisation of power-trains, and on the adaptation of power-trains to renewable fuels. Other activities will aim to improve the functionality of vehicles, reduce their complexity and weight, and refine the management of thermal and energy flows. The EGVI PPP is also contributing to the development of new standards and of training and new curricula for highly skilled workers.

The private side committed itself to engage the stakeholders community to complement the € 750 million of funding for EGVI with private investment of 5 to 10 times that level in addition to its in-kind contribution to the EGVI projects under Horizon 2020.

The aims of the EGVI cPPP extend beyond research and innovation to production, commercialisation and the creation of markets for the new technologies. The innovations developed through it are expected to improve the competitiveness of Europe's automotive industry, a sector on which about 12 million mostly highly-skilled jobs depend directly or indirectly. It will also boost the car industry's ability to support EU policies on clean transport, energy and the environment.

Progress of the EGVI cPPP

Four FP7 calls were issued for the Green Cars research PPP across five themes: Information and Communication Technologies (ICT); Energy; Environment (including climate change); and Transport; as well as Nanotechnologies, Materials and Production technologies (NMP). In total, 113 of the 385 FP7 project proposals were selected for funding, receiving a combined EU contribution of \in 439.2 million. Their implementation mobilised 1 317 participants, including a large number of industrial partners (56 %) and notably SMEs (13 % of all participants).

The launch of the EGVI cPPP in Horizon 2020 has contributed to the submission of a large number of competitive projects. There was one EGVI call in Horizon 2020 in 2014 for which 99 proposals were submitted and 17 projects were selected for funding, receiving a total EU contribution of \in 148.5 million. They included 265 participants, with an industrial involvement of 54 % including 53 SMEs as partners. In 2015 two more topics are covered under the GV-2015 call, with an indicative budget of \in 30 million, with a deadline for proposal submission of 15 October 2015.

Priorities in the Calls

Following on from the successful implementation of the Green Cars PPP under FP7, Horizon 2020 is providing funds for the EGVI cPPP under the Transport Challenge with a smaller contribution from the Industrial Leadership pillar. All sectors of the economy potentially stand to gain from this cPPP's progress towards more energy-efficient and sustainable road transport.

The priorities for the period 2014-15 included areas such as energy management in electric vehicles, new generation of Li-ion and post Li-ion batteries, hybrid light and heavy-duty vehicles, future alternative fuel power-trains, or the integration of electric vehicles into the transport system and the grid.

The call topics proposed for 2016-17 will cover priority areas such as advanced power-train technologies and new vehicle architectures, weight reduction, improved aerodynamics and rolling resistance and component development for alternative fuel vehicles. Concerning new forms of energy, the interfaces between the vehicles and the recharging infrastructure will also need to be taken into account with particular attention to standardisation issues. Demonstration activities will play an essential role in ensuring a proper and timely deployment of the new technologies.

The estimated EU funding for 2016 is \in 96 million and for 2017 \in 128 million.



Call topics planned for 2016 and 2017 under the EGVI cPPP				
Topic code	Topic title	Type of Action	Expected Deadline	Budget (M€)
GV-02-2016	Technologies for low emission light duty powertrains	RIA	26 January 2016	80
GV-03-2016	System and cost optimised hybridisation of road vehicles	IA		
GV-11-2016	Stimulating European research and development for the implementation of future road transport technologies	CSA		
GV-12-2016	ERA-NET Co-fund on electromobility	ERA-NET Co-fund		
NMBP-08-2016	Affordable weight reduction of high-volume vehicles and components taking into account the entire life-cycle	RIA	21 January 2016	16
GV-01-2017	Optimisation of heavy duty vehicles for alternative fuels use	IA	01 February 2017	128
GV-04-2017	Next generation electric drivetrains for fully electric vehicles, focusing on high efficiency and low cost	RIA		
GV-05-2017	Electric vehicle user-centric design for optimised energy efficiency	RIA		
GV-06-2017	Physical integration of hybrid and electric vehicle batteries at pack level aiming at increased energy density and efficiency	IA		
GV-07-2017	Multi-level modelling and testing of electric vehicles and their components	RIA		
GV-08-2017	Electrified heavy duty vehicles integration with fast charging infrastructure	IA		
GV-09-2017	Aerodynamic and flexible trucks	IA		
GV-10-2017	Demonstration (pilots) for integration of electrified L-category vehicles in the urban transport system	IA		

NMP: Nanotechnologies, Advanced Materials and Production Call; GV: Green Vehicles Call

Sustainable Process Industry

The European process industry is traditionally an energy and resource-intensive industrial domain. It is made up of more than 450 000 individual enterprises, at least 6.8 million employees and no less than € 1.6 trillion in turnover, and accounts for 20 % of the EU manufacturing sector, both in terms of employment and turnover. The European process industry currently suffers from a problem of competitiveness on the world stage, since a significant proportion of raw materials is imported and energy in Europe is expensive.

The process industry delivers both final products for the end customer and intermediate products required for other manufacturing activities. Consequently, advances towards greater resource and energy efficiency throughout this sector could help to boost sustainability and competitiveness throughout the economy. The aim is to make efficiency improvements to enable reductions of up to 30 % in fossil energy intensity, up to 20 % in non-renewable, primary raw material intensity, and up to 40 % in CO₃-equivalent footprints.

The SPIRE cPPP

The SPIRE cPPP is focused on the needs of its eight sectors, which are at the core of many European manufacturing value chains: cement, ceramics, chemicals, engineering, minerals and ore, non-ferrous metals, steel and water. The private side of the cPPP is the SPIRE association, which proposed a clear vision for the future of the process industry in Europe, a long-term commitment and ambitious targets. SPIRE aims to renew the process industry, improving its competitiveness and making it more sustainable. The initiative will strongly support the achievement of the goals set out in the Europe 2020 strategy.

The specific objectives set out in the multi-annual roadmap of the SPIRE cPPP are to integrate and demonstrate at least 40 innovative systems and technologies in the domains of:

- adaptable processes able to use different feedstocks;
- reduction and re-use of waste;
- innovative processes leading to ${\rm CO_2}$ reduction;
- · green technologies to develop novel materials;
- · industrial processes reducing water use.

The private side committed itself to engage the stakeholders community to complement the \in 900 million of funding for SPIRE with private investment of 5 to 10 times that level in addition to its in-kind contribution to the SPIRE projects under Horizon 2020.

Progress of the SPIRE cPPP

Following the success of the three research PPPs in the European Economic Recovery Plan, the SPIRE cPPP was launched in Horizon 2020 to address the process industry involving key actors of the value chain.

For the five 2014 and 2015 calls covered under the SPIRE cPPP in Horizon 2020, 205 proposals were submitted and 34 projects have been selected for implementation, receiving a total EU contribution of \in 201 million. They include 432 participations, with an industrial involvement of 58 % and with 26 % of SME partners.

Priorities in the Calls

The SPIRE cPPP receives its main support from the LEIT-NMBP part of Horizon 2020, with contributions also from the Energy and Environment Challenges.

The priorities for the period 2014-15 included areas such as integrated process control, processes allowing the use of renewables as flexible feedstocks, downstream processing of mixtures, assessment of energy and resource efficient solutions, heat recovery, solar cooling systems, industrial symbiosis, process intensification, recovery technologies, and handling of solids.

The topics proposed for 2016 and 2017 cover priority areas such as resource-efficient water management, flexible and delocalised approaches for intensified processing, process optimisation for raw material resources efficiency, and new electrochemical solutions for industrial processing.

The estimated EU funding is € 127 million for 2016 and € 98 million for 2017.





Topic code	Topic title	Type of Action	Expected Deadline	Budget (M€)
SPIRE 1-2016	Systematic approaches for resource-efficient water manage- ment systems in process industries	IA		74
SPIRE 2-2016	Plant-wide monitoring and control of data-intensive processes	RIA		
SPIRE 3-2016	Industrial technologies for the valorisation of European bio- resources into high added value process streams	IA		
SPIRE 4-2016	Industrial furnace design addressing energy efficiency in new and existing furnaces	RIA	21 January 2016	
SPIRE 5-2016	Potential use of CO ₂ /CO and non-conventional fossil natural resources in Europe as feedstock for the process industry	CSA		
SPIRE 6-2016	Business models for flexible and delocalised approaches for intensified processing	CSA		
EE 17-2016	Valorisation of waste heat in industrial systems	IA		8
EE 21 – 2016	Eranet Cofund actions supporting joint actions towards increasing energy efficiency in industry and services	ERA-NET Cofund	31 October 2016	5
CIRC 01-2016	Systemic, eco-innovative approaches for the circular economy: large-scale demonstration projects	IA	Two stages: 8 March 2016 6 September 2016	30
LCE 25 -2016	Utilisation of captured ${\rm CO_2}$ as feedstock for the process industry	RIA	16 February 2016	10
SPIRE 7-2017	Integrated approach to process optimisation for raw material resources efficiency, excluding recovery technologies of waste streams	IA		
SPIRE 8-2017	CO ₂ utilisation to produce added value chemicals	RIA		
SPIRE 9-2017	Pilot lines based on more flexible and down-scaled high per- formance processing	IA		80
SPIRE 10-2017	New electrochemical solutions for industrial processing, which contribute to a reduction of carbon dioxide emissions	RIA	19 January 2017	
SPIRE 11-2017	Support for the enhancement of the impact of SPIRE PPP projects	CSA		
SPIRE 12 -2017	Assessment of standardisation needs and ways to overcome regulatory bottlenecks in the process industry	CSA		
EE 17-2017	Valorisation of waste heat in industrial systems	IA		8
CIRC 01-2017	Systemic, eco-innovative approaches for the circular economy: large-scale demonstration projects	IA	Two stages: 7 March 2017 5 September 2017	10

SPIRE: Sustainable process industries Call; EE: Energy-Efficiency Call; LCE: Competitive Low-Carbon Energy Call; CIRC: Circular Economy Call

Further information

General

- HORIZON 2020
 - http://ec.europa.eu/research/horizon2020/index en.cfm
- Contractual Public-Private Partnerships in research and innovation http://ec.europa.eu/research/industrial_technologies/
- Participant Portal: Funding Opportunities and support services
 http://ec.europa.eu/research/participants/portal/desktop/en/home.html
- CORDIS: the primary information source for EU-funded projects and results http://cordis.europa.eu/projects/home_en.html

External websites

Factories of the Future cPPP

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

Energy-efficient Buildings cPPP

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

European Green Vehicles Initiative cPPP

- European Green Cars Initiative (ECGI)
 http://www.green-cars-initiative.eu
- The European Road Transport Research Advisory Council (ERTRAC) http://www.ertrac.org/

Sustainable Process Industries cPPP

 Sustainable Process Industry (SPIRE) http://www.spire2030.eu/

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The contractual Public-Private Partnerships (cPPPs) launched in Horizon 2020 address research and innovation activities in areas of strategic importance to the European Union's competitiveness and industrial leadership, and offer solutions for specific societal challenges.

Initially introduced as part of the European Economic Recovery Plan in 2008, the three research Public-Private Partnerships (PPPs) on Factories of the Future, Energy-efficient Buildings and Green Cars, mainly supported by DG Research and Innovation, have proved under FP7 that they were helping the manufacturing, construction and automotive sectors, and in particular, the relevant SMEs, to adapt to global competitive pressures by improving their technological base.

Under Horizon 2020, the successors of these three PPPs and the new PPP initiative on Sustainable Process Industry are implemented as contractual Public-Private Partnerships. The Horizon 2020 Work Programme for 2016-17 includes opportunities for research and innovation activities under those four contractual PPPs, to develop clean technologies for Europe's industrial competitiveness, leading to job creation and economic growth.

