Contractual Public Private Partnerships to Stimulate Innovation in the European Manufacturing Industry

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Five of the Priority areas from Juncker's Agenda:

- 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;
- To make Europe a stronger global actor

The Framework Programme Horizon 2020

- Excellent science, Competitiveness, Better society
New R&I Strategic Priorities

• **Open Innovation**
  • Reforming the Regulatory Environment
  • Boosting Private Investment in R&I
  • Maximising impacts of Horizon 2020

• **Open Science**
  • Better Science through openness
  • A research Integrity Initiative

• **Open to the World**
  • International Cooperation for Global Challenges
  • Science Diplomacy
Role of R&I

Horizon 2020

Priority 1: Excellent Science

Priority 2: Industrial Leadership

Leadership in enabling and industrial technologies (LEIT)

(i) ICT including micro- and nano-electronics and photonics

(ii) Nanotechnologies

(iii) Advanced Materials

(iv) Biotechnology

(v) Advanced Manufacturing & Processing

(vi) Space

Access to risk finance
Leveraging private finance and venture capital for R&I

Innovation in SMEs
Fostering all forms of innovation in all types of SMEs

Priority 3: Societal Challenges
Leadership in Enabling and Industrial Technologies (LEIT)

- Key enabling technologies and support to innovative SMEs to exit the economic crisis
- Emphasis on R&D and innovation areas with strong industrial dimension and based on industrial needs
- Involvement of industrial participants and SMEs to maximise expected impact
- LEIT projects should be outcome oriented and should bring close to application the technologies developed
Industrial mastering and deployment of Key Enabling Technologies (KETs)

What are KETs?

- Six strategic technologies
- Driving competitiveness and growth opportunities
- Contributions to solving societal challenges
- Knowledge- and Capital-intensive
- Cut across many sectors

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<th>Micro- and nano-electronics</th>
<th>Photonics</th>
<th>Biotechnology</th>
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European KET Strategy:
- KET High-level Group
Why Public-Private Partnerships in Horizon 2020?

- To solve problems together with industry
- To strengthen European industrial leadership
- To facilitate prioritisation of R&I in line with the Europe 2020 objectives and industry needs
- To leverage research and innovation elements
- To strongly commit industry to joint objectives
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<td>• <strong>Factories of the Future (FoF)</strong></td>
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<td>• Clean Sky</td>
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<td>• Single European Sky ATM Research (SESAR)</td>
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<td>• Fuel Cells and Hydrogen (FCH)</td>
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<td>• Electronic Components and Systems (ECSEL - old ARTEMIS + ENIAC)</td>
<td>New:</td>
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<td>New:</td>
<td>• <strong>Sustainable Process Industry (SPIRE)</strong></td>
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<td>• Bio-based Industries (BBI)</td>
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<td>• Big Data</td>
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Contractual arrangement

• **Main roles in a contractual PPP**
  • Private sector partners advise the Commission on R&I priorities for the Horizon 2020 work programmes
  • Implementation via Commission WPs for R&I using Horizon 2020 Rules for Participation and with comitology

• **Content of the document:**
  • Scope and Specific Objectives,
  • Activities, investment and outputs,
  • Governance and openness,
  • Specific commitments of each side,
  • Monitoring and Key Performance Indicators,
  • Duration and review
  • The Multi-annual roadmap is an Annex
Factories of the Future PPP

- Manufacturing sector
  - 23% of European jobs (over 30 million)
  - The vast majority are in SMEs
  - Manufacturing gives 80% of EU exports
  - Complex R&D-intensive activity
  - R&D costs and risks are high
- Technological capabilities and supply chains are dispersed across the EU
- Critical mass of stakeholders at EU level is needed to go beyond the capacity of individual Member States
Goals of the FoF PPP

- Strengthen EU industrial competitiveness and sustainability
- Reduce energy consumption up to 30%
- Reduce use of material up to 20%
- 20% less waste generation
- Increase the share of manufacturing in EU GDP to 20% by 2020
Specific objectives of FoF

R&I to integrate and demonstrate at least 40 innovative manufacturing technologies in:

- 8 in High-tech manufacturing processes and systems (e.g. 3D printing)
- 10 in Adaptive and smart manufacturing equipment (e.g. robots for SMEs)
- 10 in Intelligent and holistic processes to increase performance using ICT
- 4 in Collaborative and mobile enterprises (e.g. locally-adapted production)
- 6 in Human-centred manufacturing (e.g. the workplaces of the future)
- 2 in Customer-focused manufacturing (e.g. personalised products)
Implementation of the FoF PPP

**FP7 (2010-2013)**
€665 million of EU contribution => 151 successful projects

**Horizon 2020 (2014-2020)**
€1150 million of indicative EU contribution

2014-2015:
• 57 successful projects for an EU contribution of €263 million
• 60% of Industrial partners
• 36% of SME partners
Project COMET

- Plug-and-produce COMponents and METHods for adaptive control of industrial robots enabling cost effective, high precision manufacturing in factories of the future
- [http://www.cometproject.eu/](http://www.cometproject.eu/)
- Start: September 2010
- End: June 2013
- €5.4 m in EC funding

**Achievements:**
- It can do the handling and the machining in one go
- High-precision machining 2 to 5 times more cost-effective
- Increased flexibility
Project MiRoR

- Miniaturised Robotic systems for holistic in-situ Repair and maintenance works in restrained and hazardous environments
- [https://www.nottingham.ac.uk/miror/index.aspx](https://www.nottingham.ac.uk/miror/index.aspx)
- Start: February 2012
- End: January 2016
- €3.4 m in EC funding

- Achievements
  - Reduction of life-cycle costs of serviced installations
  - Shorten intervention times on capital intensive industrial installations
Project I-Ramp³

- Intelligent Reconfigurable Machines for Smart Plug&Produce Production
- **http://www.i-ramp3.eu/**
- Start: October 2012
- End: September 2015
- €5.0 m in EC funding

- Achievements:
  - Conversion of equipment into network-enabled devices
  - 50% decrease of ramp-up time for joining technologies
  - 90% decrease of ramp-up time for specialized assembly systems
Sustainable Process Industry PPP

• Process industries

• Eight EU industrial sectors: chemical, steel, cement, ceramics, minerals, non-ferrous metals, industrial water and process engineering

• 6.8 million jobs in 450,000 enterprises

• Turnover of over €1,600 billion/year

• At the core of the value chains and highly dependent on resources

• Striving for competitiveness and sustainability

• High risks and long-term investments

• Need for co-operation along the value chains
Goals of the SPIRE PPP

- Integration and demonstration of innovative processes and systems for increased resource efficiency
- Reduction of fossil energy intensity up to 30% by 2030
- Reduction of up to 20% in non-renewable, primary raw material intensity by 2030
- Reduction in GHG of up to 40% by 2030 compared to 1999 levels
Implementation of the SPIRE PPP

Horizon 2020 (2014-2020)
€900 million of indicative EU contribution

2014-2015:
- 34 successful projects for an EU contribution of €201 million
- 58% of Industrial partners
- 26% of SME partners
Project E4Water

Economically and ecologically efficient water management in the European chemical industry

- [http://www.e4water.eu/](http://www.e4water.eu/)
- Start: May 2012
- End: April 2016
- 11 m€ EC funding

- Impact:
  - 45% in water use
  - 65% in wastewater production
  - 15% reduction in energy use
Project Consens

Integrated Control and Sensing for Sustainable Operation of Flexible Intensified Processes

- Start: January 2015
- End: December 2017
- 6 m€ EC funding
- Impact targets:
  - Reduction of CO2 emission
    - 230,000 t/year in polymer
    - 170,000 t/year in pharmaceutical & specialty industry
  - Less consumption of non-renewable raw material
    - 176,000 t/year less in use of solvents in pharmaceutical & specialty industry
Horizon 2020 Rules

Types of action

• **RIA:** Research and innovation actions → Core activities in research
• **IA:** Innovation actions → Core activities in innovation
• **CSA:** Coordination and support actions

Simplified funding rates

• Up to 100 % of the eligible costs; but up to 70% in IA if profit-seeking organisations
• Single indirect cost model: 25% flat rate for all

Evaluation criteria

• Excellence – Impact – Quality and efficiency of the action (similar with FP7)
• Thresholds are depending on the call conditions

Time to Grant shortened

• Maximum 8 months to Grant Agreement (and evaluation results before 5)
• Grant preparation rather than negotiation (proposals are evaluated "as is" and not "what could be")
Factories of the Future PPP

**FOF-6:** New product functionalities through advanced surface manufacturing processes for mass production, **RIA**

**FOF-7:** Integration of unconventional technologies for multi-material processing into manufacturing systems **RIA**

**FOF-8:** In-line measurement and control for micro-/nano-enabled high-volume manufacturing for enhanced reliability, **IA**

**FOF-9:** Novel design and predictive maintenance technologies for increased operating life of production systems, **IA**

**FOF-10:** New technologies and life cycle management for reconfigurable and reusable customised products, **IA**

**FOF-12:** ICT Innovation for Manufacturing SMEs (I4MS) **(IA+CSA)**
SPIRE-7: Integrated approach to process optimisation for raw material resources efficiency, excluding recovery technologies of waste streams, **IA**

SPIRE-8: Carbon dioxide utilisation to produce added value chemicals, **RIA**

SPIRE-9: Pilot lines based on more flexible and down-scaled high performance processing, **IA**

SPIRE-10: New electrochemical solutions for industrial processing, which contribute to a reduction of carbon dioxide emissions, **RIA**

SPIRE-11: Support for the enhancement of the impact of SPIRE PPP projects, **CSA**

SPIRE-12: Assessment of standardisation needs and ways to overcome regulatory bottlenecks in the process industry, **CSA**
EE 17: Valorisation of waste heat in industrial systems, IA

CIRC-01: Systemic, eco-innovative approaches for the circular economy: large-scale demonstration projects

b) Systemic services for the circular economy (2017), IA
Thank you for your attention

More information:

HORIZON 2020:

Contractual Public-Private Partnerships in research and innovation: