



European
Commission



SPIRE cPPP and calls 2017

**Leadership in Enabling and
Industrial Technologies**

**Eastern Partnership Panel
on Energy Security**

Bruxelles, 20 December 2016

Søren Bøwadt

DG Research and Innovation

HORIZON 2020

The Policy Context for NMBP

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

Strategic priorities of Commissioner Moedas:

- Open innovation, Open science, Open to the world

The WP approach of Horizon 2020

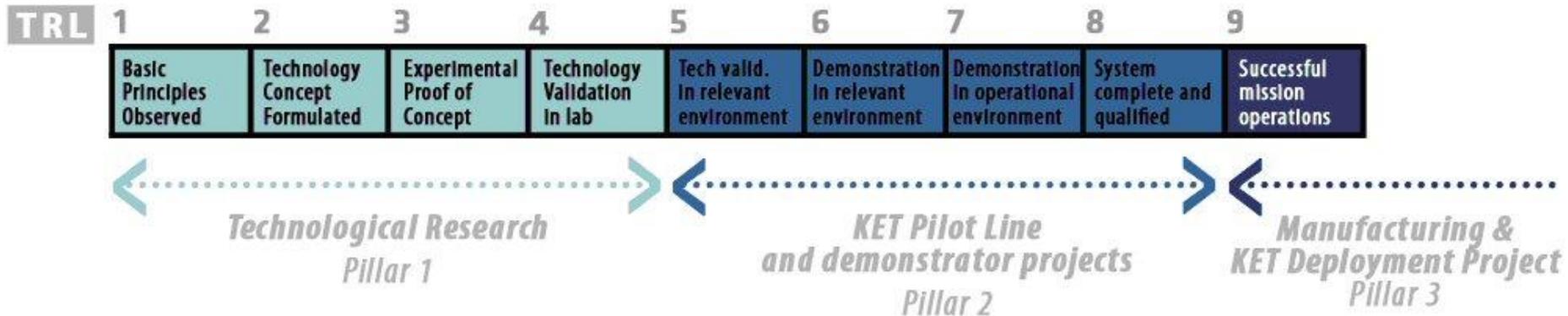
- A strong **challenge-based approach**, allowing applicants considerable freedom to come up with innovative solutions
- Simplified list of possible types of action (e.g. research and innovation at 100%; innovation actions at 70%,...)
- Strong emphasis on expected impact, less prescriptive
- Cross-cutting issues mainstreamed (e.g. social sciences, gender, international co-operation...)
- Work programmes with 2-year duration

PPPs in Horizon 2020

Institutionalised PPPs	Contractual PPPs
<ul style="list-style-type: none"> • Innovative Medicines (IMI) • Clean Sky • Single European Sky ATM Research (SESAR) • Fuel Cells and Hydrogen (FCH) • Electronic Components and Systems (ECSEL - old ARTEMIS + ENIAC) <p>New:</p> <ul style="list-style-type: none"> • Bio-based Industries (BBI) • Shift2Rail 	<ul style="list-style-type: none"> • Factory of the Future (FoF) • Energy-efficient Buildings (EeB) • Green Vehicles (EGVI) • Future internet (5G) <p>New:</p> <ul style="list-style-type: none"> • Sustainable Process Industry (SPIRE) • Robotics • Photonics • High Performance Computing • Big Data

* All announced in the Communication on PPPs in H2020 (July 2013) except Big Data.

The LEIT part of the WP uses **Technology Readiness Levels** (or TRL) from 3-4 up to 7-8



Synergies with other EU, national or regional programmes are encouraged:

- Some topics are particularly suitable for **additional funding**
 - ⇒ e.g. to explore paths to commercial exploitation or to deploy H2020-funded technologies

2016 NMBP Single stage calls

FOF	EEB	SPIRE
€77,000,000	€49,000,000	€74,000,000

Evaluated proposals	113	58	63
Requested EC Contribution	€511,185,310	€246,901,637	€337,385,263
Average	€4,523,764	€4,256,925	€5,355,322

Below thresholds	89	40	46
Above thresholds	24	17	17
Main List (nb)	17	11	14
Main List (EC Funding)	€74,074,040	€49,472,261	€71,470,535

Success rate (€)	14.5%	20.0%	21.2%
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Industry-share and outreach in 2014-15

cPPPs	FoF	EeB	EGVI	SPIRE
% of Industry in the participants	60	56	54	59
% of SMEs in the participants	36	30	20	26
Total countries in the selected projects	28	29	21	31
% of Non-members in the participants (2014)	77	75	67	73
% of Non-members in the EC funding (2015)	77	70	53	71

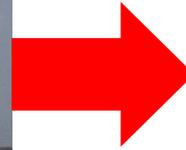
Contractual Public Private Partnerships in Horizon 2020	EU indicative funding 2014-2020 (M€)
Factories of the Future (FoF)	1150
Energy-efficient Buildings (EeB)	600
European Green Vehicles Initiative (EGVI)	750
Sustainable Process Industry	900
Advanced 5G network infrastructure for the Future Internet (5G)	700
High Performance Computing (HPC)	700
Robotics	700
Big Data	534
Photonics	700
TOTAL:	6734

Industry has committed to complement these amounts with private investment in the order of of **3 to 10 times the level of public funding in addition to the in-kind contribution in the cPPP projects under Horizon 2020.**



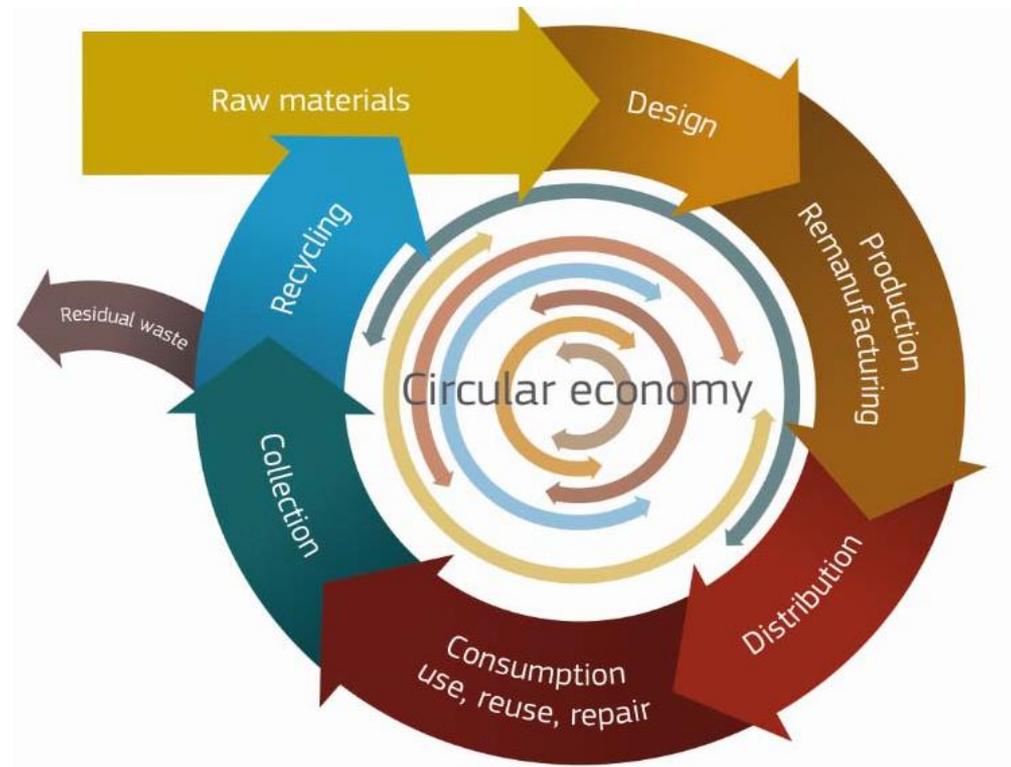
cPPP	Contribution to Economy
Factories of the Future (FoF)	Manufacturing: 16% of Europe's GDP, 30 million jobs, twice as many in support activities such as logistics, 80% of the EU's exports are manufactured
Energy-efficient Buildings (EeB)	Construction sector: 11.5 million direct jobs, 8.8 % of total employment, 7% of EU28 non-financial business economy.
European Green Vehicles Initiative (EGVI)	12 million direct jobs, over € 500 billion/year in turnover
Sustainable Process Industry (SPIRE)	20% of the European manufacturing base, 450,000 companies providing 6.8 million jobs
Advanced 5G network infrastructure for the Future Internet (5G)	40% of the worldwide market of nearly €200 billion in 2012 in terms of network infrastructure supply
High Performance Computing (HPC)	Europe is a world-leader in HPC applications that are key for our society
Robotics	Robotics is a key enabling industry for manufacturing
Photonics	Europe holds 18% of the global photonics market, € 66 billion share
Big Data	Big Data market is growing six times faster than the overall ICT market. The compound annual growth rate (2013-17) expected to reach the overall total of \$50 billion.

Vision of the SPIRE PPP



CIRCULAR ECONOMY

- no longer linear
- extended life time
- collaborative approach
- cross-sectors
- multi-stakeholders
- innovation in all forms
- design strategies
- new business models
- demand-side measures
- etc...



**EUR 6-8
million**



**IA
70%**

**TRL
5-7**

SPIRE 7 – 2017:

Integrated approach to process optimisation for raw material resources efficiency, excluding recovery technologies of waste streams

Goals:

- Most efficient use of raw materials resources for high performance and sustainable production, accompanied by the optimisation of the interfaces along the value chain in the factory.
- Technological improvements that enable the reduction of material losses and energy consumption in the entire production environment, increasing the current production rates.
- Identification of key bottlenecks and improvement opportunities to increase yields while maintaining or lowering the energy consumption of the original processes.

**EUR 6-8
million**



**RIA
100%**

**TRL
4-6**

SPIRE 8 – 2017: CO₂ Utilisation to produce added value chemicals

Proposals should address innovative processes to produce added value chemicals from CO₂ (and CO) and demonstrate the technical and economic feasibility in an industrially relevant environment through demonstration of a system prototype.

Goals:

- Demonstrate technical and economic feasibility of novel processes for CO₂ and CO conversion to added-value chemicals.
- Reduction of at least 20%, on Life-Cycle-Assessment basis, of the emissions of greenhouse gases and energy/resource intensity with respect to commercial manufacturing of the same product.
- Significant increase of the industrial competitiveness deriving from the novel processes

**EUR 6-8
million**



**IA
70%**

**TRL
5-7**

SPIRE 9 – 2017: Pilot lines based on more flexible and down-scaled high performance processing.

Goals:

- Develop high performance production lines for novel or existing products providing lower capex and opex compared to existing analogues or similar processes
- Concepts should allow the elimination, combination or replacement of one or more process steps/units to increase efficiency and productivity
- Concepts should provide high flexibility (ability to follow demand), short time to market
- Industrially relevant demonstration to validate performance in real environment and potential for integration in existing plants
- Techno economic analysis providing information on the economic viability of the solutions

**EUR 4-6
million**



**RIA
100%**

**TRL
4-6**

SPIRE 10 – 2017: New electrochemical solutions for industrial processing, which contribute to a reduction of CO₂ emissions

Electrochemical processes have the potential to be highly efficient and thereby create less by-product waste compared to conventional chemical processes.

Goals:

- New electrochemical synthesis and/or electrolysis, which allows the direct creation of products
- Significant improvements in energy and resource efficiency compared to the commercially available analogue
- Easy integration with renewable energy, ease of operation at low temperature and pressure conditions as well as improvement in safety and work environment.



CSA
100%

**EUR 250000 -
500000**

SPIRE 11 – 2017 : Support for the enhancement of the impact of SPIRE PPP projects

Dissemination, exploitation and transfer of projects results are important activities during project life-time and beyond in order to make sure that projects fully achieve the expected impacts. Clustering of project activities, and their inter-linking with existing technology transfer activities, are effective ways to stimulate the take-up of project results and to exploit synergies.

Goals:

- Speeding up industrial exploitation and take up of results of SPIRE PPP projects and facilitate cross-sectorial technology transfer.
- Stimulation of networks and alliances for further RTD and industrial innovation in the addressed technology and application areas, including the development and practical application of a clustering model.
- Added value beyond the original scope of the SPIRE PPP projects by exploiting synergies and sharing best practice. Increased public presence and awareness of SPIRE PPP activities.

*Only one proposal
funded*



CSA
100%

**EUR 500000 -
1000000**

SPIRE 13 – 2017 : Potential of Industrial Symbiosis in Europe

The Circular Economy approach is dependent on industrial symbiosis (IS) whereby waste and by-products from one factory are used as an input for other factories. Such inter-plant integration can be crucial to cut energy consumption, avoid waste and create a business case for by-products and gaseous effluents and thereby decouple the use of resources from economic growth. While IS is increasingly considered to be an essential part of economic and environmental policy, the benefits and the dynamics involved needs to be better understood before the concept can be fully implemented.

Goals:

- List of best practices as well as new potential locations together with estimates of needed investments and incentives to unlock the potential.
- Identification of essential technologies and potential regulatory barriers
- Speeding up of cross-sectorial transfer of technologies
- Estimation of potential OPEX cost through implementation

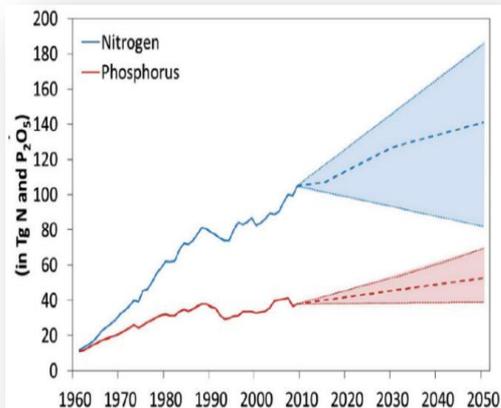
Topic identifier	Deadline 2017	Budget (EUR million)
SPIRE 7 – 13 (2017)	19/01/2017	80.00
NMBP PILOTS	27/10/2016 (1 stage) 04/05/2017 (2 stage)	186.19 32.00

This presentation is based on the WP
Always check legal documents 18

For proposers – Do not forget to consider:

- **Value Chain Approach**
- **Cross Sectorial / Transferable Technologies**
- **Lifecycle perspectives**
- **Outline Business Plan**
- **Valorisation of results and products**
- **Address Non-technological barriers / bottlenecks**
- **Links to Legislation and Standardisation**
- **No negotiation of proposals → Only **complete** proposals can be funded**
- **AND don't forget to Pre-register your proposal and submit IN TIME**

Industrial Nitrogen Fixation



- Important chemical process for fertilizer industry
- Energy consumption of 36.6 GJ / ton NH₃
- Emissions of 1.87 ton CO₂ / ton NH₃ and 7 kg N₂O / ton HNO₃

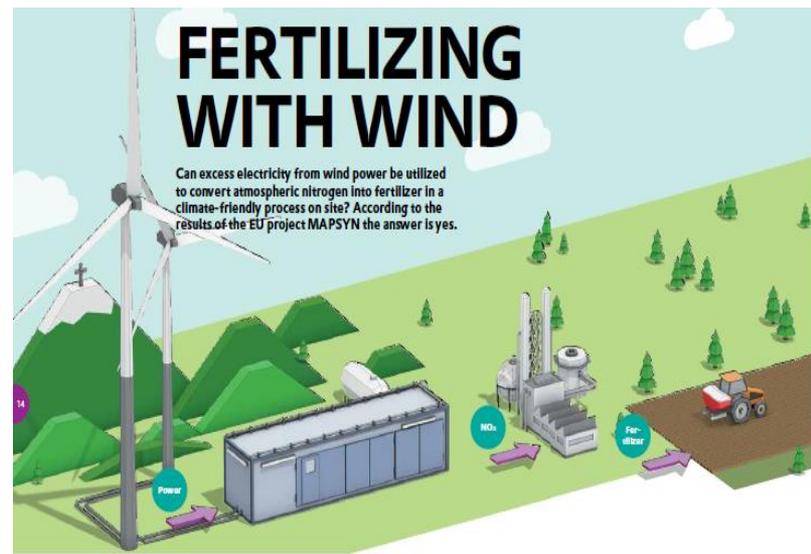
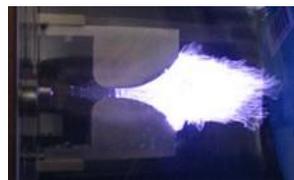
New Windows of Opportunity
Decentralized Fertilizer Production¹

Plasma-assisted Nitrogen Fixation



+

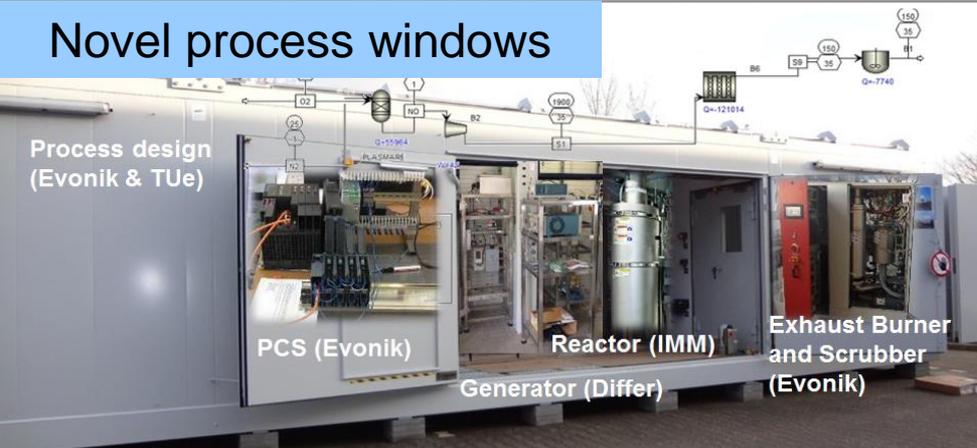
Non-thermal Plasma



¹ Lang, J. & Moussallem, I., "GLOBAL CHALLENGES: NITROGEN FIXATION", *Elements*, 55. 2016, pp.14-16

From New Processes to New Business-Social Opportunities

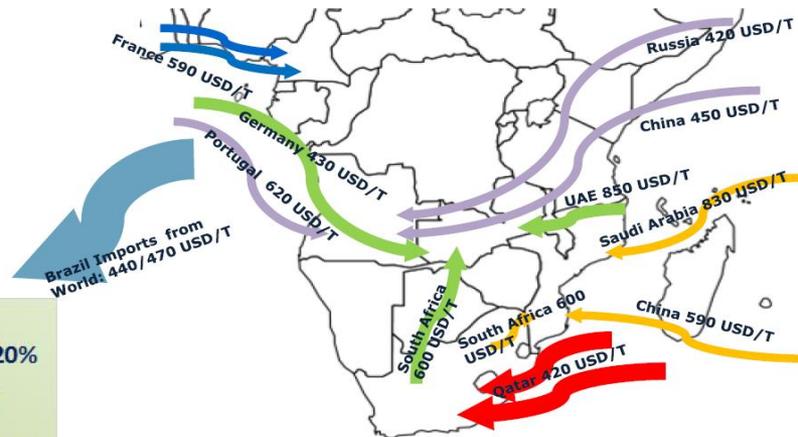
Novel process windows



New idea to Solve Hunger on the Planet

Affordability?

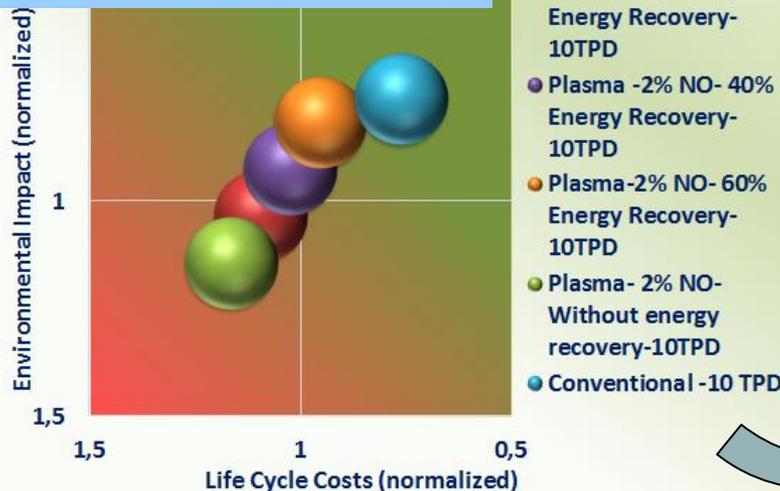
High port price create inaccessibility to large share of Africa



Structurally high urea prices already at Africa's port entry

Source Stamicarbon analysis, based on WorldBank, Integer, CRU, IFA

Life-Cycle Thinking



What is needed to succeed:

- Brilliant ideas and innovation
- Catalysts (both human and technical)
- Collaboration
- Trust

Open innovation, Open science, Open to the world

Registration as EC evaluation and monitoring expert:

<http://ec.europa.eu/research/participants/portal/desktop/en/experts/index.html>



More info:

Søren Bøwadt

- **European Commission**
- **DG Research and Innovation**
- **Industrial technologies**

- *Mail: COV2 04/062, B-1049 Brussels - Belgium*
- *Visit Address: Covent Garden Place Rogier 16, B-1060 Brussels Belgium*
- *Phone Direct line: +32 (2) 299 42 03*
- *Fax: +32 (2) 296 05 50*
- *E-mail: Soren.Bowadt@ec.europa.eu*

About Horizon 2020

<http://ec.europa.eu/research/horizon2020/>

