



“Horizon 2020” Opportunities for the process industry in the 2019 SPIRE calls



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European Commission**

NMBP WP 2019

Call – INDUSTRIAL SUSTAINABILITY

- **Overarching objectives:**

- *To further strengthen the global competitiveness of the European industry, as well as its environmental sustainability.*
- *Contribute and enable to the achievement of the EU Climate and Energy targets by 2030 :*
 - *GHG reduction by 40%*
 - *Renewables share 27%*
 - *Energy efficiency improvements by 30%**Even more critical in light of the latest IPCC report.*
- *Contribute to the Sustainable Development Goals.*

NMBP-SPIRE calls for 2019

- Provide major momentum to R&I across the SPIRE process industry sectors with in excess of 98 M€ in calls only from NMBP.
- Build on the positive results achieved so far, aiming at further upscaling and large scale demos to enable prompt industrial deployment

Focus for 2019:

- Strengthen industrial competitiveness by improving process performance while reducing costs (OPEX, CAPEX) and environmental footprint.
- Target breakthrough improvements in resource and energy efficiency across the process industry, through more integrated and efficient downstream processes and digitalisation.
- Support the upgrading of existing large scale installations through smart retrofitting concepts to improve production and environmental performance.

CE-SPIRE-04-2019: Efficient integrated downstream processes

Specific Challenge:

- Downstream processing represents on average 50-60% of the total capital (CAPEX) and operating costs (OPEX) and they can account for up to 45% of the process energy in industrial operations.
- Energy and cost intensive downstream processing operations are often linked to the inefficiencies in the upstream process (e.g. low conversion, formation of co-products, by-products and/or impurities).
- Hybrid approaches (e.g. chemical + biochemical steps) can provide major advantages in terms of upstream process performance (high selectivity, milder process conditions). However, their industrial application is still relatively limited.
- Better integration of upstream and downstream unit operations can lead to significant resource and energy efficiency gains in the process industry.

CE-SPIRE-04-2019: Efficient integrated downstream processes

Scope:

Development of economic and industrially viable intensified process technologies providing a deeper integration of upstream and downstream operations.

- Multistep upstream processes, potentially hybrid approaches (e.g. chemo and bio catalytic) and PATs,
- Complex downstream operations, integrating different separation techniques and purification steps,
- Consider modularity and flexibility, as well as potential for transition from batch to continuous operations,
- Increased in safety, productivity, purity and quality of products, as well as resource and energy efficiency while lowering the process environmental footprint, production costs and time to market,
- DEMOs must be included. In real industrial settings (added-value),
- Integration current industrial landscape and replicability to be considered.

***EUR from 10 to 14
millions***

CE-SPIRE-04-2019: Efficient integrated downstream processes

Expected impact:

- 20% decrease in greenhouse gas emissions,
- Increased in resource and energy efficiency by at least 20%,
- Novel modular and scalable integrated (upstream-downstream) pilot line technologies with 10% decrease in CAPEX and OPEX,
- Effective dissemination of major innovation outcomes, through the development of learning resources with potential for integration in learning programs (e.g. existing curricula, undergraduate level, etc.).

Relevant indicators and metrics, with baseline values, should be clearly stated in the proposal.

CE-SPIRE-05-2019: Adaptation to variable feedstock through retrofitting

Specific Challenge:

- Long lifetime of the equipment in the process industry for adequate viability (>30 years)
- Challenges:
 - Keeping facilities up to date both from technological and regulatory point of view (e.g., zero waste, circular economy).
 - Increased variety of inputs, need for higher energy efficiency

CE-SPIRE-05-2019: Adaptation to variable feedstock through retrofitting

IA
100-50%

TRL
5-7

Scope (1/2):

Proposals need to cover the following:

- **Simulation models and decision support tools**, including the **detection of inefficiencies** (flexibility to use feedstock of variable composition, energy efficiency and product quality)
- The development of tools and **methodologies to streamline and support retrofitting**;
- Find the **most efficient operational input conditions to optimise the performances**;
- Develop **indicators to modify input variables** and its potential of **replication** across the industry;

CE-SPIRE-05-2019: Adaptation to variable feedstock through retrofitting

IA
100-50%

TRL
5-7

Scope (2/2):

- **Adapt equipment** → larger number and more diverse feedstock → transition to variability in quality, quantity and price of feedstock
- Demonstrate the **feasibility** and suitability at **industrial scale** in different process industries covering **both the technology** and the **process control**
- **Cooperation** with other projects; **user involvement**; **accessibility** and **reusability of data**

CE-SPIRE-05-2019: Adaptation to variable feedstock through retrofitting

Expected impact:

EUR
(8-12 millions)

- ↑ Resource and energy efficiency > 20%;
- ↓ GHG emissions > 30%;
- ↓ Fossil resources > 20%;
- ↓ OPEX by 30%; ↑ productivity by 20%;
- Dissemination of major innovation outcomes (learning resources with flexible usability).

Relevant indicators and metrics, with baseline values, clearly stated

CE-SPIRE-06-2019: Digital technologies for improved performance in cognitive production plants

Specific Challenge:

Shortage in raw materials, increased energy prices and environmental constraints require the European process industry to improve its performance and flexibility and there are unexploited opportunities for digitising a large range of enterprises of very different size in the process industry.

Digitisation endows the production system with capabilities for analysis. This should enable the autonomous operation of the system based on embedded cognitive reasoning, while relying on high-level supervisory control.

As a consequence, changes in the production process need to be detected and the system needs to be able to respond to these dynamic fluctuations, by adapting the production to stay within the target ranges of production costs and rate, as well as those of and sustainability parameters.

A fully up-to-date interactive and self-learning process control integrated with management tools is essential to obtain an optimal efficiency, while maintaining adequate flexibility of the system in regard to changing feedstock, energy sources and product demand.

CE-SPIRE-06-2019: Digital technologies for improved performance in cognitive production plants

Scope:

- **Improvement of online monitoring and innovative control technologies** in terms of process performance and flexibility, maintenance needs and product quality;
- **Digital retrofitting of existing assets**, integration towards and holistic optimisation of operations, data-analytics, real-time capability, use role-specific representation of information, feedback control & detect deviations and adjust operations immediately decision support (e.g. advanced process control, reactive scheduling);
- Several among the following concepts: apply low-cost sensors for on-line assessment of product quality and integration into process control; robust optimisation methods to distributed targeted process monitoring; simulation methods for the analysis, characterisation and study of systems for enhanced operations and decision-making combination of various forms of data with cognitive insight to optimise and enhance resources;

Replicability and scalability of the concepts should be considered appropriately.

TRL
5-7

IA
70%

CE-SPIRE-06-2019: Digital technologies for improved performance in cognitive production plants

EUR (6-8 millions)

Expected impact:

- Increased production performance, energy and resource consumption, or waste or by-products production will be significantly improved by more than 20%.
- Project outcomes should demonstrate a positive environmental impact, by reducing CO2 emissions compared to the state of the art and in the scale relevant for the different applications
- Show potential for improved performance in cognitive production plants
- Effective dissemination of major innovation outcomes to the current next generation of employees of the SPIRE sectors, through the development, by education/training experts, of learning resources with flexible usability. These should be ready to be easily integrated in existing curricula and modules for undergraduate level and lifelong learning programs.

Relevant indicators and metrics, with baseline values, should be clearly stated in the proposal.

LC-SC3-RES-7-2019: Solar Energy in Industrial Processes

Specific Challenge:

- Large potential of applying solar energy for industrial purposes
- Using solar energy to provide the heat or cooling necessary to industrial processes that need high reliability, high quality heat & cooling and continuous operation
- Industrial processes might need to be adapted to the use of the solar resource
- Industrial actors expect solutions with limited installation, maintenance and operation requirements and which are easy to operate.

LC-SC3-RES-7-2019: Solar Energy in Industrial Processes

Scope:

- Support will be given to solutions that cover the highest possible share of the heating and/or cooling demand of one or more industrial processes by means of solar thermal energy
- In the case of heating, the process temperature shall be higher than 150°C
- Individual industrial sites and/or industrial parks (coupled to a district heating and/or cooling network) are in scope

EUR from 3 to 5 million

RIA 100%

LC-SC3-RES-7-2019: Solar Energy in Industrial Processes

Expected impact:

- Increased decarbonisation of the industrial sector, reduced dependency on fossil fuels, reduction of emission of air pollutants
- Enhanced visibility to the potential of applying solar thermal energy in industrial processes, especially in those EU countries where such systems currently have very limited or no application
- Contribution to the development of relevant BREFs under the Industrial Emissions Directive

**TRL
to 4-5**

***SMEs encouraged
to participate***

Deadlines 2018– 2019 / Indicative Budgets

Topic	Budget 2018 (M€)	Budget 2019 (M€)	Deadlines
CE-SPIRE-04-2019 CE-SPIRE-05-2019		Total: 65.8	16 Oct.18- 21 Feb. 2019
DT-SPIRE-06-2019		32.9	16 Oct.18- 21 Feb. 2019
LC-SC3-RES-7-2019		10.0	27 Aug 2019



Thank you!

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Link to Funding & tender Opportunities Portal (H2020section):

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/programmes/h2020>