#InvestEUresearch

Horizon 2020 Work Programme for Research & Innovation 2018-2020

Industrial Innovation Information Days
Brussels 3-4 October 2017

NMBP Programme
2018 TOPICS FACTORIES OF THE FUTURE (FOF)

Unit D2

DG Research & Innovation

Research and Innovation

TRANSFORMING EUROPEAN INDUSTRY

Objectives

- Transform European industry through the integration of digitisation and other enabling technologies
- Achieve global industrial leadership
- Create opportunities for re-industrialisation

- Complements the call 'Foundations for Tomorrow's Industry'
- Contributes to the focus area on Digitising and Transforming European Industry and Services

Factories of the Future

Objectives

- make the necessary adaptations in terms of manufacturing excellence and flexibility
- capitalise on the increasing demand for more customised and higher-quality products.
- transition to a flexible, digitalised and demand-driven manufacturing sector
- lower energy consumption and waste generation

DT-FOF-01-2018:
Skills needed for new Manufacturing jobs (CSA) – German Esteban

European Commission

Topic Code: DT-FOF-01-2018: Skills needed for new Manufacturing jobs (CSA)

Specific Objective:

- **Breakthrough education** and **training** paradigms for continuous training of the existing workforce.
- Development of **new skills** and **competences** in a quick and efficient way.
- **Workers** at the forefront of **innovation**, driving industry towards a **transition** to the use of **sophisticated machines** and **new technologies**.
- Need to strengthen **human capital**, **employability** and **competitiveness** for **Advanced Manufacturing** KET.
- Support to the **Blueprint** for **Sectoral Cooperation on Skills**, one of the ten actions in the EU Skills Agenda, beyond Additive Manufacturing within **several areas** from the **Factories of the Future** priorities.

European Commission

Topic Code: DT-FOF-01-2018: Skills needed for new Manufacturing jobs (CSA)

CSA
100%

Scope:

- Shortages and mismatches in technical and non-technical skills, knowledge and competences, including digital capabilities
- Map existing national initiatives upskilling the existing workforce to develop an EU strategy
- Lifelong learning and granting of qualification for personnel in industrial settings. Real case scenarios to be applied in a variety of industrial areas
- Innovative and hands-on approaches, including SSH elements, attracting more women, through training activities and knowledge management with senior employees. On-site, modular and e-learning education free of charge
- Exchange between industry, trade unions, educational centres, national employment agencies

European Commission

Topic Code: DT-FOF-01-2018: Skills needed for new Manufacturing jobs (CSA)

EUR from 1 to 2 millions

Expected impact:

- Real and measurable steps towards the **reduction** of identified skill **gaps** leading to the **upskilling** of the existing **workforce** in Europe and, as a consequence, **increased innovation performance** in the industry concerned;
- At least **15 new job profiles** per industrial **area** analysed, leading to a **longer work life** for jobholders;
- Close and continuous **engagement** between relevant industry, trade union, academia, educational centres (including vocational schools) across Europe to **stimulate networks** in the European Research Area as a whole.

European Commission

DT-FOF-02-2018:
Effective Industrial Human-Robot Collaboration (RIA)

European Commission

DT-FOF-02-2018: Effective Industrial Human-Robot Collaboration (RIA)

Specific Objective:

- Back to the drawing board: **genuine** Human-Robot Collaboration (HRC) on the factory floor.
- Holistic Smart mechatronic systems **DESIGNED for** HRC
  - improve the quality of the job
  - to increase flexible production
- Interdisciplinary research (Robotics, Cognitive science, Psychology)
- Beyond safety also:
  - Regulatory aspects.
  - Ergonomics
  - Adaptability
  - Liability issues
  - Inclusiveness of vulnerable workers
  - Acceptability and feedback from users

European Commission

DT-FOF-02-2018: Effective Industrial Human-Robot Collaboration (RIA)

Scope:

2 out of 3

- Novel human-centred designed smart mechatronic systems
- Artificial Intelligence
- Robotic hazard assessment and risk

TRL 4 to 6

RIA-100%

European Commission

DT-FOF-02-2018: Effective Industrial Human-Robot Collaboration (RIA)

Expected impact:

- Bring back production to Europe;
- 15% increase in Job Quality
- 20% reduction
  - Production reconfiguration time
  - Production cost.

EUR 6-8 millions

SSH

European Commission

DT-FOF-03-2018:
Innovative manufacturing of opto-electrical parts (RIA) – Gustaf Winroth

European Commission

DT-FOF-03-2018: Innovative manufacturing of opto-electrical parts

Specific Challenge:
Optoelectronics and opto-electrical components involve the interactions of photons and electrons.
Application examples: lasers, photodiodes, image sensors, optical amplifiers, modulators, solar cells, embedded optics and light-emitting diodes

- However, **new processes need to be introduced** into production systems.
- When going into the scale-up phase, many **processes need to be adjusted** to fit the production of complex, often free-form components.
  - The adjustments include both component specific changes as well as standard process steps. Due to the need to produce **large varieties of parts in small batches**, process adjustments have to be **both rapid and accurate**.
- The **equipment for testing, failure analysis and control equipment** needs to follow a fast pace of technical advancement, and **cover a range of sensors**, such as **electrical, optical, magnetic and thermal sensors**.

European Commission

DT-FOF-03-2018: Innovative manufacturing of opto-electrical parts

Scope:

/…/ a variety of new processes applicable to the production of opto-electrical components, for instance:

- material handling
- material strain engineering
- Patterning
- material deposition
- Assembly
- joining and bonding.

TRL 4-6

RIA 100%

Furthermore, quality needs to be ensured by reliable sensors throughout the production line. The processes need to include a level of sustainability that allows the final products to be recycled and reintroduced into the value chain.

European Commission

TRL 4-6

RIA 100%

DT-FOF-03-2018: Innovative manufacturing of opto-electrical parts

Scope:

Proposals need to cover all of the following areas:

- New, flexible, and innovative process chains to handle complex designs that include **opto-electrical functionalities**;
- Improved **sensor equipment for quality control** in the different processing steps as well as the final functionality of the component;
- Methodologies for improving quality through **high-precision automation** using the sensor data, including **non-destructive in-process evaluation** of material and functional component properties;
- **Re-use and requalification of key components and precious materials** within the process chain from products at their end of life.

Proposals are expected to include a **variety of use-case demonstrations** of typical opto-electrical components, in which the robustness of the processing, work piece handling, sensing and the automation approach can be demonstrated.

European Commission

DT-FOF-03-2018: Innovative manufacturing of opto-electrical parts

EUR 6-8 millions

Expected impact:

- **15% yield improvement** because of the introduction of new sensor equipment, related metrology and automatic non-destructive control;
- **15% time reduction for reconfiguration** of key process tools in a production line due to change of type of component;
- A tangible part **(> 10%)** of the production cost of the parts should **originate from recycled products and materials**.

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

European Commission

DT-FOF-04-2018:
Pilot lines for metal Additive Manufacturing (IA 50%) – German Esteban

European Commission

DT-FOF-04-2018: Pilot lines for metal Additive Manufacturing

IA
50%

Specific Objective:

- Costs and unpredictable defects in final parts and products are preventing **complete deployment** and **adoption** of **Additive Manufacturing** in the **metalworking industries**.

- The **industrial demonstration** in a **pilot line** will show the **full potential** of **metal AM** in **real manufacturing** conditions and it will serve as a **flagship** example for other stakeholders. **Quality** aspects to be significantly improved include **robustness**, **stability**, **repeatability**, **speed** and **right-first-time manufacturing**.

European Commission

DT-FOF-04-2018: Pilot lines for metal Additive Manufacturing (IA 50%)

TRL
From 5 to 7

Scope:

- Multi-scale and multi-physics simulations of the process and the whole system from early design phase. Prediction and minimisation of distortion and effect on durability and expected lifetime for post processing avoiding propagation of defects to downstream stages
- In-line non-destructive testing and in-situ analysis of product
- Integration and inter-operability of AM processes into multi-stage production systems, with in-process monitoring, feedback and control
- Hybridisation of Additive Manufacturing with other processes
- Certification, regulatory and standardisation activities related to the proposed solutions and AM produced parts
- Occupational exposure in terms of health, safety and environment together with the recycling of unused materials

European Commission

DT-FOF-04-2018: Pilot lines for metal Additive Manufacturing (IA 50%)

EUR from 12 to 15 millions

Expected impact:

- Increase in robustness of metal AM-based processes by 40% and production speeds by 25%;
- Reduction of time to market by 25% and 'right first time' capability by 40%;
- Reduction of uncertainties of selected material quality parameters by 50%, resulting in improving product quality by 40%;
- New certification schemes for industrial "3D-Printed" parts and products in collaboration with relevant certification stakeholders;
- New standardisation of specific categories not included in current ISO/ASTM/CEN CENELEC TCs.

European Commission

ICT Programme
Topic DT-ICT-07-2018-2019: Digital Manufacturing Platforms for Connected Smart Factories – Arian Zwegers

European Commission

DT-ICT-07-2018-2019: Digital Manufacturing Platforms for Connected Smart Factories

Specific Challenge:

- **Increasing role digital manufacturing platforms**
- **Advances needed in integration different technologies, making data accessible, and allowing complementary applications**
- **Challenge to exploit new concepts and technologies**

NB:

- **Part of Focus Area "Digitising and transforming European industry and services: digital innovation hubs and platforms"**
- **Introductory texts "Platforms and Pilots" are applicable, in addition to specific topic texts**
- **See also Digitising European Industry WG2,**
  - **https://ec.europa.eu/futurium/en/dei-implementation**

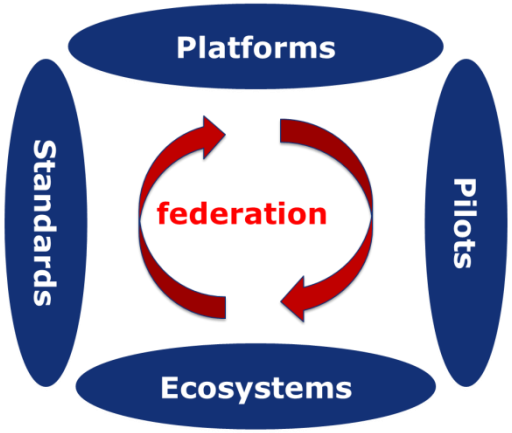
European Commission

DT-ICT-07-2018-2019: Digital Manufacturing Platforms for Connected Smart Factories

TRL ±4-7

Scope Innovation Actions:

- Develop platforms for connected smart production facilities
  - Driven by EU actors and safeguarding European interest
  - Two industrial sectors
- Target at least one 'grand challenge' *:
  - Agile Value Networks: lot-size one (2018 call)
  - Excellence in manufacturing: zero-defect processes, products (2018)
  - Human factor: human competences and technological progress (2019 call)
  - Sustainable Value Networks: manufacturing in circular economy (2019)
- Reference implementations preferably in open-source
- Max 20% financial support to third parties (typically 50-150 k€)



IA

* See document "Factories 4.0 and Beyond" on http://www.effra.eu/

European Commission

DT-ICT-07-2018-2019: Digital Manufacturing Platforms for Connected Smart Factories

Scope Coordination and Support Actions:

- **Cross-fertilise Industrial Platform communities, allowing for easier take-up of digital technologies, supporting transfer skills and know-how between academia and industry**
- **2019 call**

CSA

European Commission

DT-ICT-07-2018-2019: Digital Manufacturing Platforms for Connected Smart Factories

Expected impact:

- Significant increase options SMEs/mid-caps to integrate technologies, unlock value data, deploy complementary applications, and become responsive link in supply and value networks
- Strengthened competitive position European platform providers
- Increased cooperation industrial and academic communities

From introductory texts:

- Increased prospects future digital industrial platforms
- Strengthened links with other programmes and initiatives
- Increased number of services/applications by European companies
- Significant, measureable contribution to standards
- Increased number of platforms, applications, business processes and innovative business models validated via large-scale piloting
- Emergence sustainable ecosystems around digital platforms

IA: 48 M€ (2018), 45 M€ (2019), up to 16 M€ would be appropriate, at least one per 'grand challenge'

CSA: 2 M€ (2019), one CSA

European Commission

ICT Programme

Topic DT-ICT-06-2018: Coordination and Support Activities for Digital Innovation Hub network

– Arian Zwegers

European Commission

DT-ICT-06-2018: Coordination and Support Activities for Digital Innovation Hub network

Specific Challenge:

- To coordinate Digital Innovation Hubs across Europe

NB:

- Part of Focus Area "Digitising and transforming European industry and services: digital innovation hubs and platforms"
- Introductory text on "Support to Hubs"
- See also Digitising European Industry WG1,
  - https://ec.europa.eu/futurium/en/dei-implementation

European Commission

DT-ICT-06-2018: Coordination and Support Activities for Digital Innovation Hub network

Scope:

- Link sectorial and technological hubs with regional/national innovation hubs to improve collaboration, reinforce specialisation and offer support to SMEs and mid-caps
- Including organisation of workshops, conferences and dissemination material
- Including development of business model for collaboration among DIHs
- Contribute to catalogue of Digital Innovation Hubs
- Close cooperation with other CSAs

European Commission

DT-ICT-06-2018: Coordination and Support Activities for Digital Innovation Hub network

Expected impact:

- **Creation of sustainable network of Digital Innovation Hubs**
- **Reinforced links with other bottom-up initiatives, supported by regional, national and European policies and funds**
- **Increased number of services and applications operated by European companies, especially small businesses and entrepreneurs**

2018
Open: 31 Oct 2017
Close: 17 Apr 2018

1 M€

European Commission

Thank you!

#InvestEUresearch

www.ec.europa.eu/research

Participant Portal: http://ec.europa.eu/research/participants/portal/

ICT Proposers' Day 2017
https://ec.europa.eu/digital-single-market/en/events/ict-proposers-day-2017
Budapest, 9-10 Nov 2017

European Commission

DT-NMBP-20-2018:
A digital 'plug and produce' online equipment platform for manufacturing (IA) – Erastos Filos

European Commission

DT-NMBP-20-2018: A digital "plug and produce" online equipment platform for manufacturing

Specific Objective:

- One of Europe's strengths in manufacturing is its **abundance of SME equipment manufacturers** with the capability to offer world-class products of highest quality and precision.
- A further strength is the large number of actors having **off-the-shelf prototypes ready** for experimentation and for market uptake.
- To **increase their visibility towards global users of equipment** and to further support digitisation of manufacturing, industrial online platforms need to be developed and set up for use on the market.

European Commission

DT-NMBP-20-2018: A digital "plug and produce" online equipment platform for manufacturing

Scope:

The envisaged innovation activities should aim at:

(a) designing and building the digital platform that brings together suppliers and users in a transparent and efficient way and

(b) at populating it with adequate product information. This will constitute a set of pilot implementations aiming at selling 'plug & produce' industrial equipment and services to customers globally.

Max . 2 plat-forms
7.5 M€ each

IA
70%

SME mfg eqpmt sup-pliers

European Commission

DT-NMBP-20-2018: A digital "plug and produce" online equipment platform for manufacturing

Expected impact:

- Deliver a B2B online platform **covering at least one key industrial equipment domain** & mobilising actors across Europe;
- Demonstrate the full capability of the platform in one dedicated industrial domain, **including associated product services (e.g. digital models enabling functional simulation)** & including the services from all 3rd parties selected in line with the conditions set out in Part K of the General Annex;
- **Showcase the platform's scalability capability** (towards all relevant industrial domains) via a reference architecture;
- Deliver **a credible business plan** that ensures long-term deployment and profitability, as well as scalability beyond the initial public financing phase;
- Demonstrate industry-wide support through an **inclusive governance structure**;
- **Increase market opportunities** for the users of the platforms, including SMEs.

European Commission

Thank you!

#InvestEUresearch

www.ec.europa.eu/research

Participant Portal www

European Commission