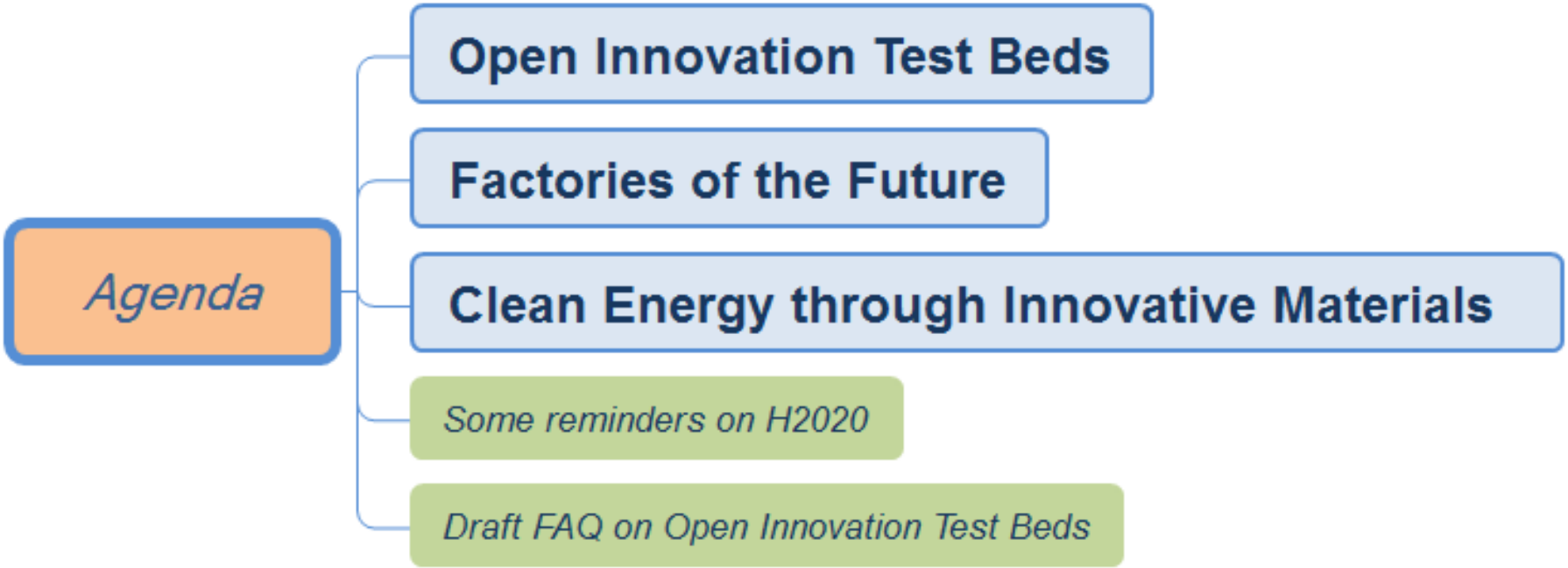
H2020 Theme Oriented Training NMBP

D Vanden Abeele

French Ministry of Higher Education, Research and Innovation

NMBP Program Committee Delegate - NCP

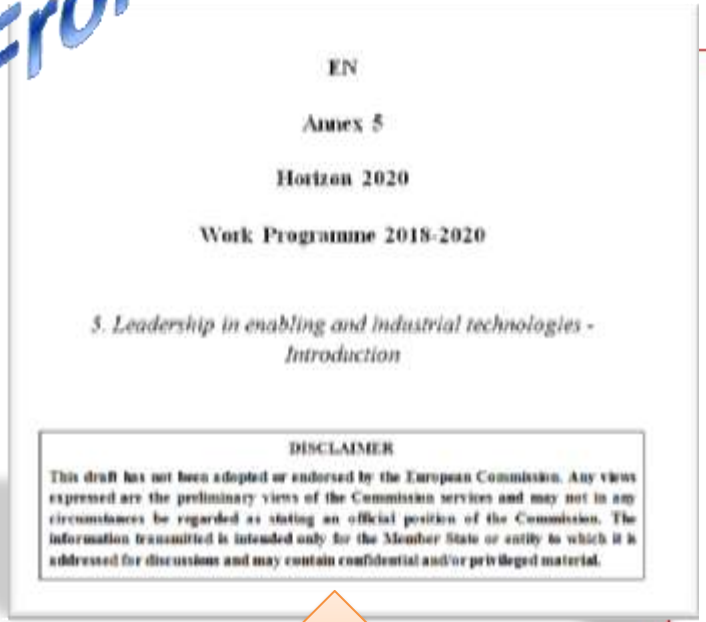
FR JRC NCP


Agenda
Open Innovation Test Beds
Factories of the Future
Clean Energy through Innovative Materials
Some reminders on H2020
Draft FAQ on Open Innovation Test Beds

REFERENCE DOCUMENTS FOR NMBP

From E.C.

Reference documents



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Annex 5

Horizon 2020

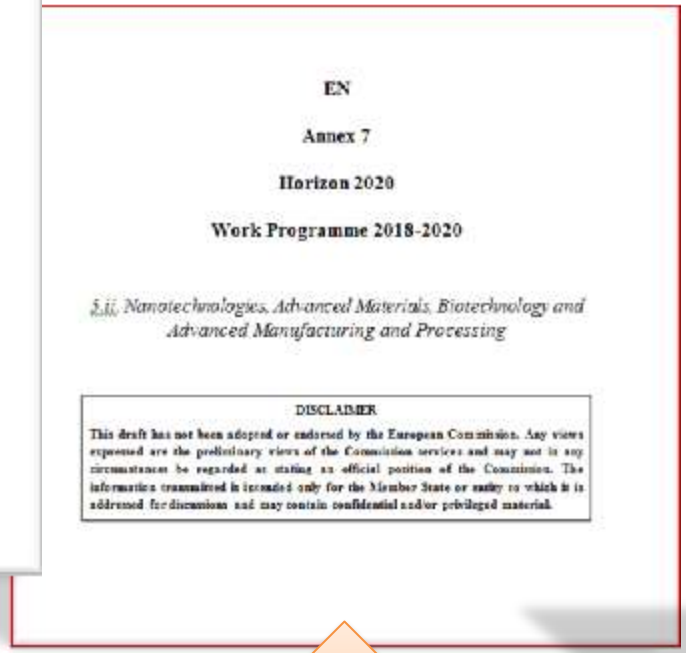
Work Programme 2018-2020

5. Leadership in enabling and industrial technologies - Introduction

DISCLAIMER

This draft has not been adopted or endorsed by the European Commission. Any views expressed are the preliminary views of the Commission services and may not in any circumstances be regarded as stating an official position of the Commission. The information transmitted is intended only for the Member State or entity to which it is addressed for discussions and may contain confidential and/or privileged material.

Context, key words



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Annex 7

Horizon 2020

Work Programme 2018-2020

5.ii. Nanotechnologies, Advanced Materials, Biotechnology and Advanced Manufacturing and Processing

DISCLAIMER

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Topics, deadline, budget

(12 September 2017)

1. **What are the Open Innovation Test Beds for material upscaling, characterisation, modelling, and safety?**

Open Innovation Test Beds are entities, established in at least three Member States and Associated Countries, offering access to physical facilities, capabilities and services required for the development, testing and upscaling of nanotechnology and advanced materials in industrial environments. The objective of Open Innovation Test Beds is to bring nanotechnology and advanced materials within the reach of companies and users in order to advance from validation in a laboratory (TRL 4) to prototypes in industrial environments (TRL 7).

Open Innovation Test Beds will upgrade existing or support new public and private test beds, pilot lines, and demonstrators to develop, test and upscale nanotechnologies and advanced materials for new innovative products and services in some specific domains.

They will be typically run by for profit organisations and or RTOs. Users could be industry, SMEs as well as innovators.

2. **How many Open Innovation Test Beds will be funded and in which domains?**

The call is expected to create about 10 Open Innovation Test Beds for materials development and upscaling in six technology domains:

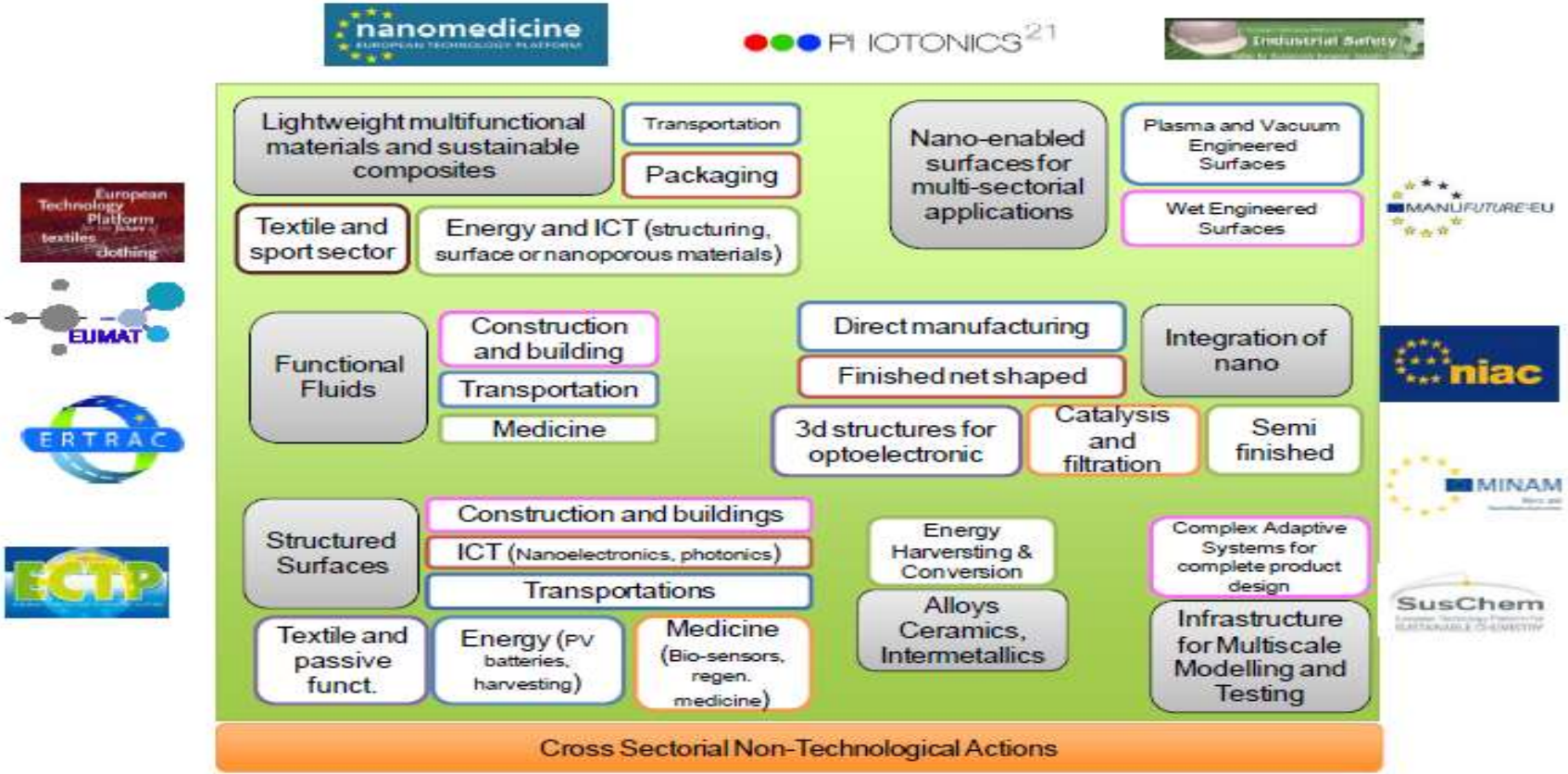
- Lightweight nano-enabled multifunctional materials and components
- Safety Testing of Medical Technologies for Health
- Nano-enabled surfaces and membranes
- Bio-based nano-materials and solutions
- Functional materials for building envelopes
- Nano-pharmaceutics production

Four Open Innovation Test Beds for materials characterisation and four Open Innovation Test Beds for modelling will be also funded, in addition to the already existing NanoSafety Platforms. These are expected to create a European

3. **Which activities of Open Innovation [illegible] will be eligible for funding?**

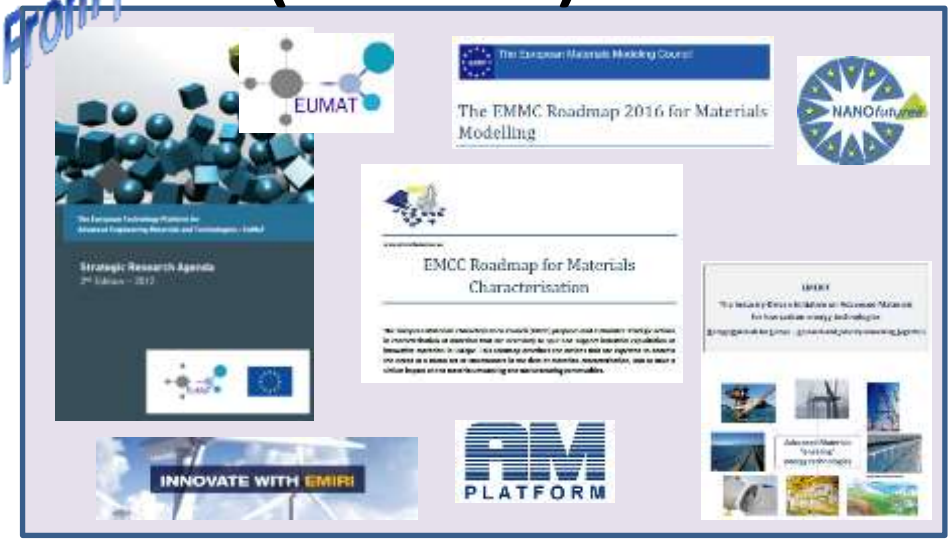
F.A.Q. Open Innovation test Beds

(part of) context of NMBP



From platforms, etc

(some) Reference Documents



OBJECTIVES OF THE NMBP WP

What is guiding the WP?
Focus areas evolution along Horizon 2020

And why this is important for the proposer ..

Sou

NMBP Work Programme 2018-2020

INDUSTRIAL SOLUTION REVOLUTION

The priorities

INDUSTRY 4.0

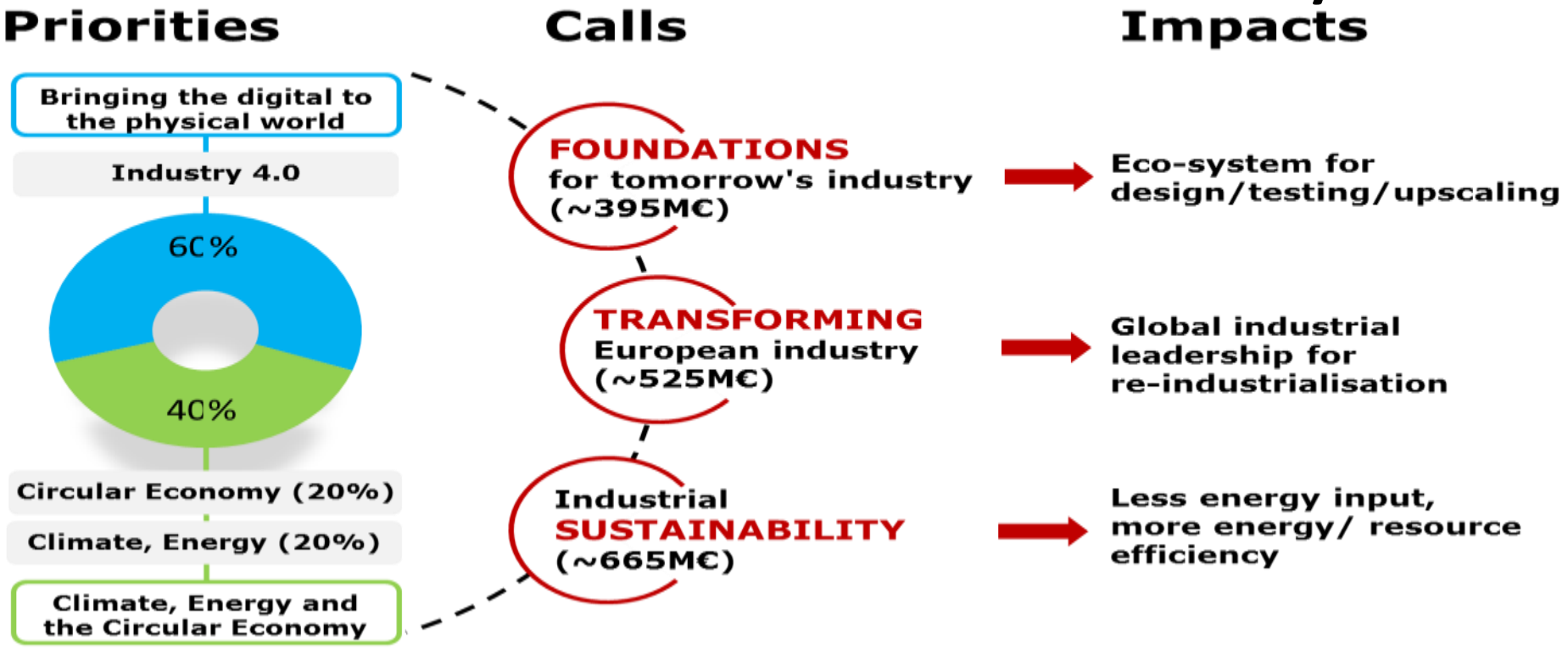
HEALTH

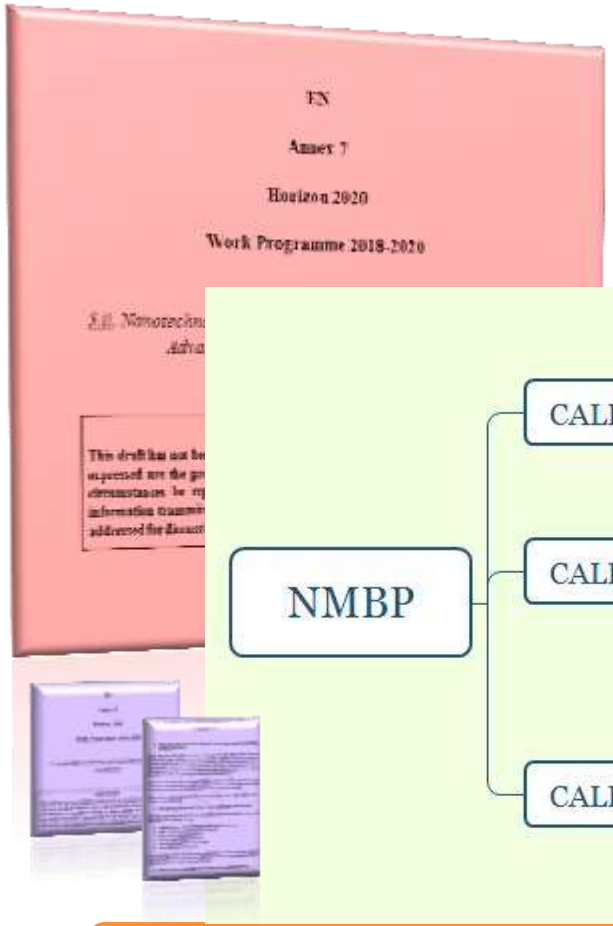
DE-CARBONISATION ENERGY

CIRCULAR ECONOMY

Each orientation is translated into CALL and **EXPECTED IMPACT**

NMBP Call: which traceability?





2018-2020 WPs

Key elements for 2018-2020

- NMBP
  - CALL - FOUNDATIONS FOR TOMORROW'S INDUSTRY
    - 1.1 OPEN INNOVATION TEST BEDS
    - 1.2 MATERIALS CHARACTERISATION and COMPUTATIONAL MODELLING
    - 1.3 GOVERNANCE, SCIENCE-BASED RISK ASSESSMENT AND REGULATORY ASPECTS
  - CALL - TRANSFORMING EUROPEAN INDUSTRY
    - 2.1. FACTORIES OF THE FUTURE (FOF)
    - 2.2 BIOTECHNOLOGY
    - 2.3. MEDICAL TECHNOLOGY INNOVATIONS
  - CALL - INDUSTRIAL SUSTAINABILITY
    - 3.1. SUSTAINABLE PROCESS INDUSTRY (SPIRE)
    - 3.2. CATALYSING THE CIRCULAR ECONOMY
    - 3.3. CLEAN ENERGY THROUGH INNOVATIVE MATERIALS
    - 3.4. CULTURAL HERITAGE
    - 3.5. ENERGY-EFFICIENT BUILDINGS (EEB)

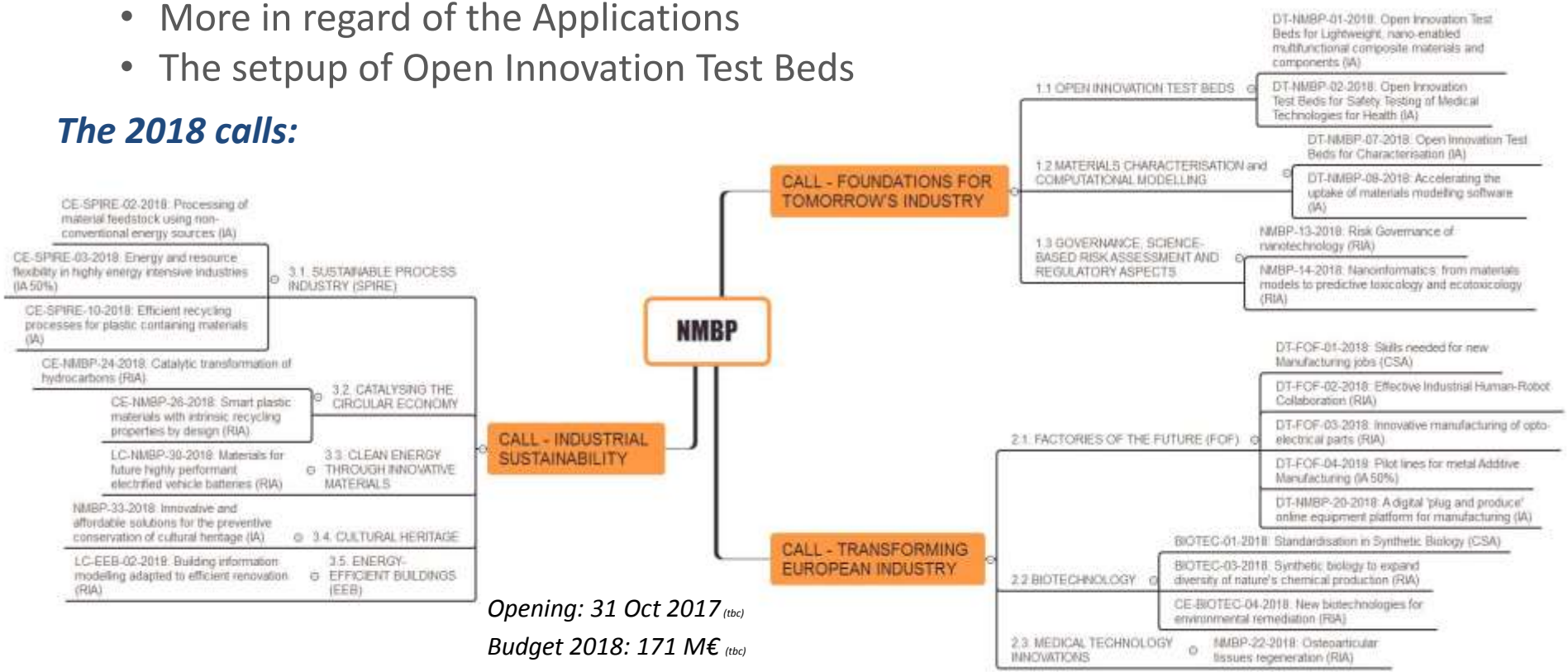
NEW! **Open Innovation Test Beds**

Nanotechnologies – Materials – Biotechnologies – Process

Main trends for 2018-2020 :

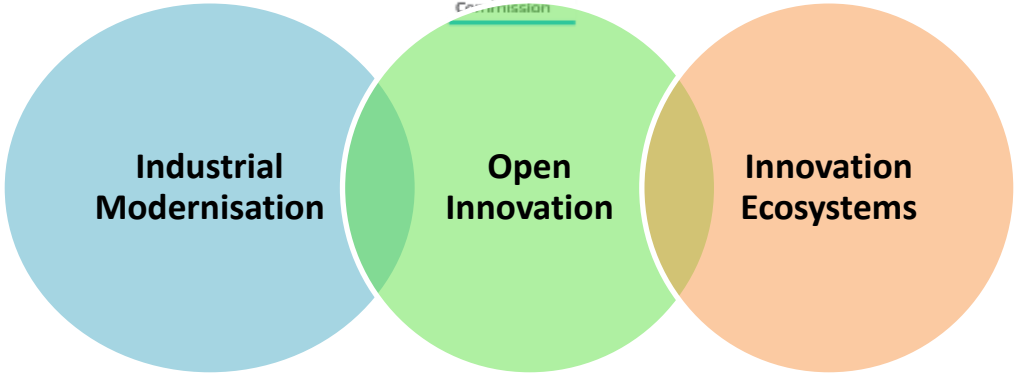
- More in regard of the Applications
- The setpup of Open Innovation Test Beds

The 2018 calls:



Opening: 31 Oct 2017 (tbc)

Budget 2018: 171 M€ (tbc)



PILOT LINES
CHARACTERISATION
MODELLING
SAFETY

ACCELERATING INNOVATION for MATERIALS Industry

In the two KETs:

Nanotechnologies and Advanced Materials

Open Innovation Test Beds

CALLS FOR PROPOSAL

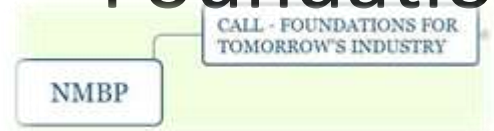
NMBP 2018-2020 – Timing

Topics (Type of Action)	Budgets (EUR million) 2018	Deadlines
Opening: 31 Oct 2017		
DT-NMBP-01-2018 (IA) DT-NMBP-02-2018 (IA)	75.00	23 Jan 2018 (First Stage) 28 Jun 2018 (Second Stage)
DT-NMBP-07-2018 (IA) DT-NMBP-09-2018 (IA)	44.00	23 Jan 2018 (First Stage)
NMBP-13-2018 (RIA) NMBP-14-2018 (RIA)	30.00	28 Jun 2018 (Second Stage)

Topics (Type of Action)	Budgets (EUR million) 2018	Deadlines
Opening: 31 Oct 2017		
CE-SPIRE-02-2018 (IA) CE-SPIRE-03-2018 (IA) CE-SPIRE-10-2018 (IA)	97.50	22 Feb 2018
LC-EEB-02-2018 (RIA) LC-EEB-06-2018-20 (IA)	35.00	22 Feb 2018
CE-NMBP-24-2018 (RIA) CE-NMBP-26-2018 (RIA)	38.00	23 Jan 2018 (First Stage)
LC-NMBP-30-2018 (RIA)	25.00	28 Jun 2018 (Second Stage)
NMBP-33-2018 (IA)	16.00	

Topics (Type of Action)	Budgets (EUR million) 2018	Deadlines
Opening: 31 Oct 2017		
DT-FOF-01-2018 (CSA)	2.00	22 Feb 2018
DT-FOF-02-2018 (RIA) DT-FOF-03-2018 (RIA) DT-FOF-04-2018 (IA)	79.00	
BIOTEC-03-2018 (RIA)	30.00	23 Jan 2018 (First Stage) 28 Jun 2018 (Second Stage)
NMBP-22-2018 (RIA)	24.00	23 Jan 2018 (First Stage) 28 Jun 2018 (Second Stage)
BIOTEC-01-2018 (CSA)	2.00	22 Feb 2018
CE-BIOTEC-04-2018 (RIA)	10.00	25 Apr 2018
Opening: 28 Nov 2017		
DT-NMBP-20-2018 (IA)	15.00	08-mars-18

Foundations for tomorrow's Industry 2018



CALL - FOUNDATIONS FOR TOMORROW'S INDUSTRY

NMBP

1.1 OPEN INNOVATION TEST BEDS

- DT-NMBP-01-2018: Open Innovation Test Beds for Lightweight, nano-enabled multifunctional composite materials and components (IA) — *2 stages* — TRL 4..7
- DT-NMBP-02-2018: Open Innovation Test Beds for Safety Testing of Medical Technologies for Health (IA) — *2 stages* — TRL 4..7

1.2 MATERIALS CHARACTERISATION and COMPUTATIONAL MODELLING

- DT-NMBP-07-2018: Open Innovation Test Beds for Characterisation (IA) — *2 stage* — TRL 4..6
- DT-NMBP-09-2018: Accelerating the uptake of materials modelling software (IA) — *2 stages* — TRL 4..7

1.3 GOVERNANCE, SCIENCE-BASED RISK ASSESSMENT AND REGULATORY ASPECTS

- NMBP-13-2018: Risk Governance of nanotechnology (RIA) — *2 stages* — TRL 4..6
- NMBP-14-2018: Nanoinformatics: from materials models to predictive toxicology and ecotoxicology (RIA) — *2 stages* — TRL 4..6

The process for presenting the topics is

The main figures

Some of the main references

Text analysis

Remark: all the examples, pictures, etc reflects my personal opinion.
Names, images, or likenesses of other companies, products and services are the property of their respective owners

What do we have on OITB?

Agenda

- **The overall scene**
- The different initiatives
- Q / A

The overall scene

Digital transformation

Industrial modernisation

Innovation-driven ecosystem

Smart Specialisation Platform

Thematic Platforms

From research to market

European Cluster Collaboration Platform

Online platforms

European Commission ***DG-Grow***

European Commission ***DG-Connect***

European Commission ***DG-RTD***

Overall goal of these strategies

- Each actions relates to **Key Enabling Technologies**
  - Offer and facilitate the access to Technologies and Knowledge
  - Offer and facilitate the access to Services
  - Encourage cooperations between Actors, Regions, Member States and EC
- But the need is to know who can do what….

DG-Grow

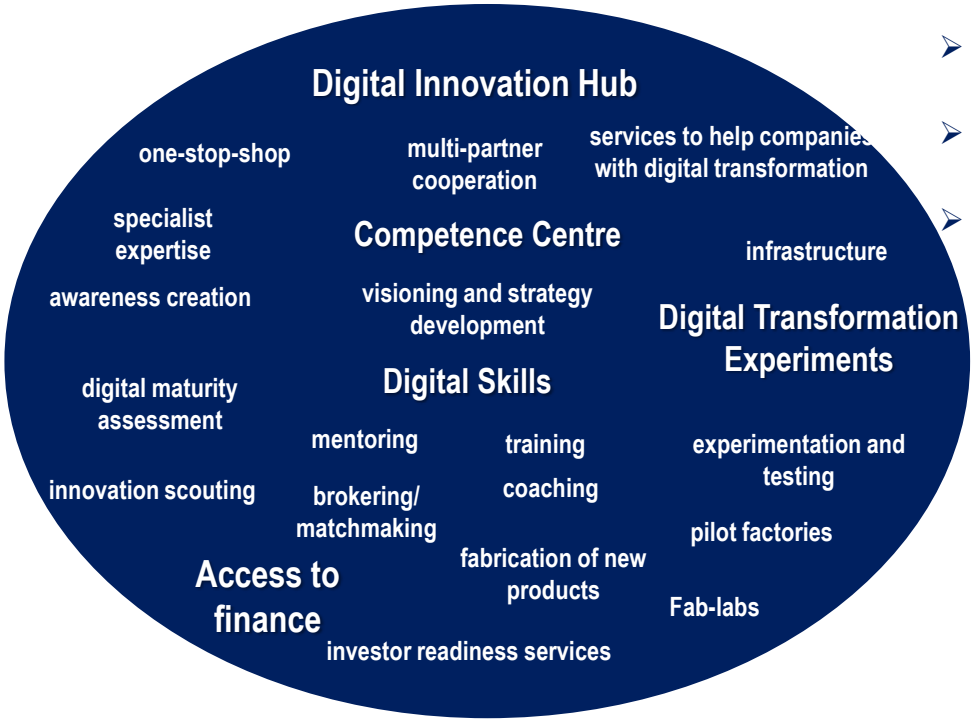
I4MS

Cartography of competencies and services should help 'actors' to find their answer

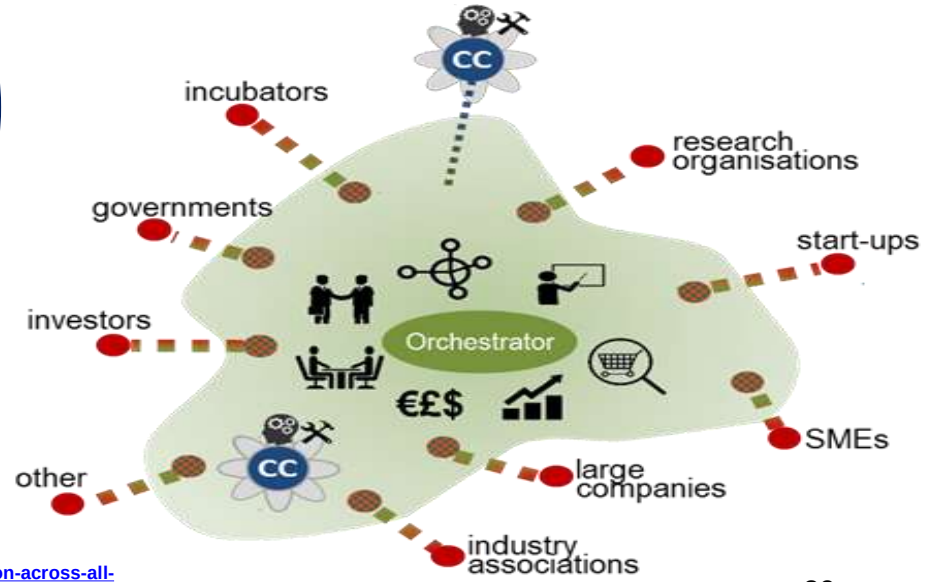
DG-RTD Pilot Li

DG-Connect (temp)

What is a Digital Innovation Hub?



- Provide support to **existing industry** to manage their **digital transformation**
- **Competence Centres** are at the **core of DIHs, ecosystem approach**
- **Variable geometries**: technology applications, sector, SME focus, service portfolios, etc
- Provides opportunities for both **ICT users** and **ICT suppliers**



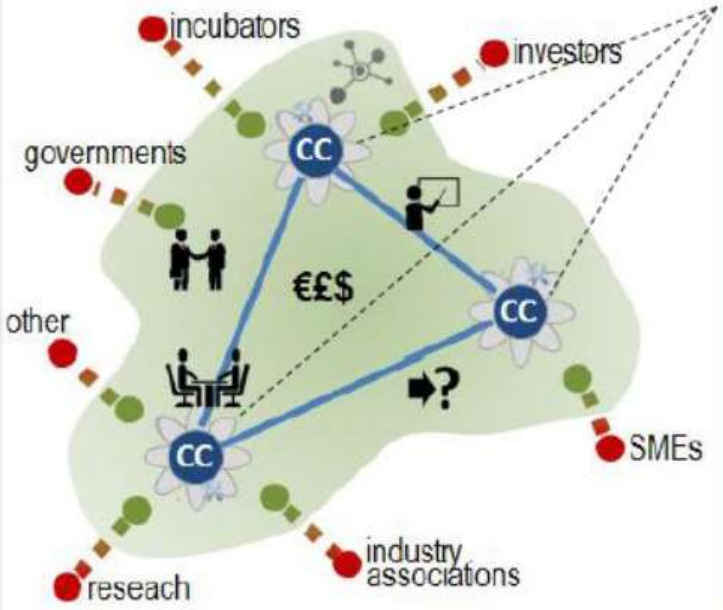
Working Group report on DIHs:

https://ec.europa.eu/futurium/en/content/report-wg1-digital-innovation-hubs-mainstreaming-digital-innovation-across-all-sectors-final

DIH vs. CC

DIGITAL INNOVATION HUB

- Awareness Creation around Digital Technologies
- Innovation Scouting
- Digital Maturity Assessment.
- Visioning and Strategy Development for Businesses:
- Brokering/matchmaking
- Access to Specialist Expertise and Infrastructure
- Mentoring
- Training
- Access to Funding and Investor Readiness Services
- Collaborative Research



COMPETENCE CENTRE

Competences in Digital Technologies

- Provide access to infrastructure and technology platforms
- Provide digitisation and application expertise
- Support experimentation in real-life environments
- Support fabrication of new products
- Demonstrate best practices
- Showcase technologies in pilot factories, fab-labs

Open Innovation Test Beds - Tasks

- Open access to facilities and services for design, development (prototyping), testing, and upscaling materials and nanotechnologies for new products
- Demonstration in the relevant industrial environments
- Show-casing technologies with user industry in cross border applications
- Facilitate access of European SMEs along product supply chains
- Identification and assessment of potential regulatory, economic and technical barriers
- Engagement of stakeholders across the EU and the Associated Countries

Open Innovation Test Beds

Budget WP
2018=75 M€
2019=50 M€
2020=40 ? M€

Lightweight nano-enabled multifunctional composite materials and components

DT-NMBP-01-2018

Safety Testing of Medical Technologies for Health

DT-NMBP-02-2018

Nano-enabled surfaces and membranes

DT-NMBP-03-2019

Bio-based nano-materials and solutions

DT-NMBP-04-2020

Nano-pharmaceuticals production

DT-NMBP-06-2020

Functional materials for building envelopes

DT-NMBP-05-2020

WP2018-2020 TIMELINE

2018

- **DT-NMBP-01-2018 Lightweight**
- **DT-NMBP-02-2018 Med Tech Health**
- **DT-NMBP-07-2018 Characterization**

2019

- **DT-NMBP-03-2019 Surfaces and membranes**

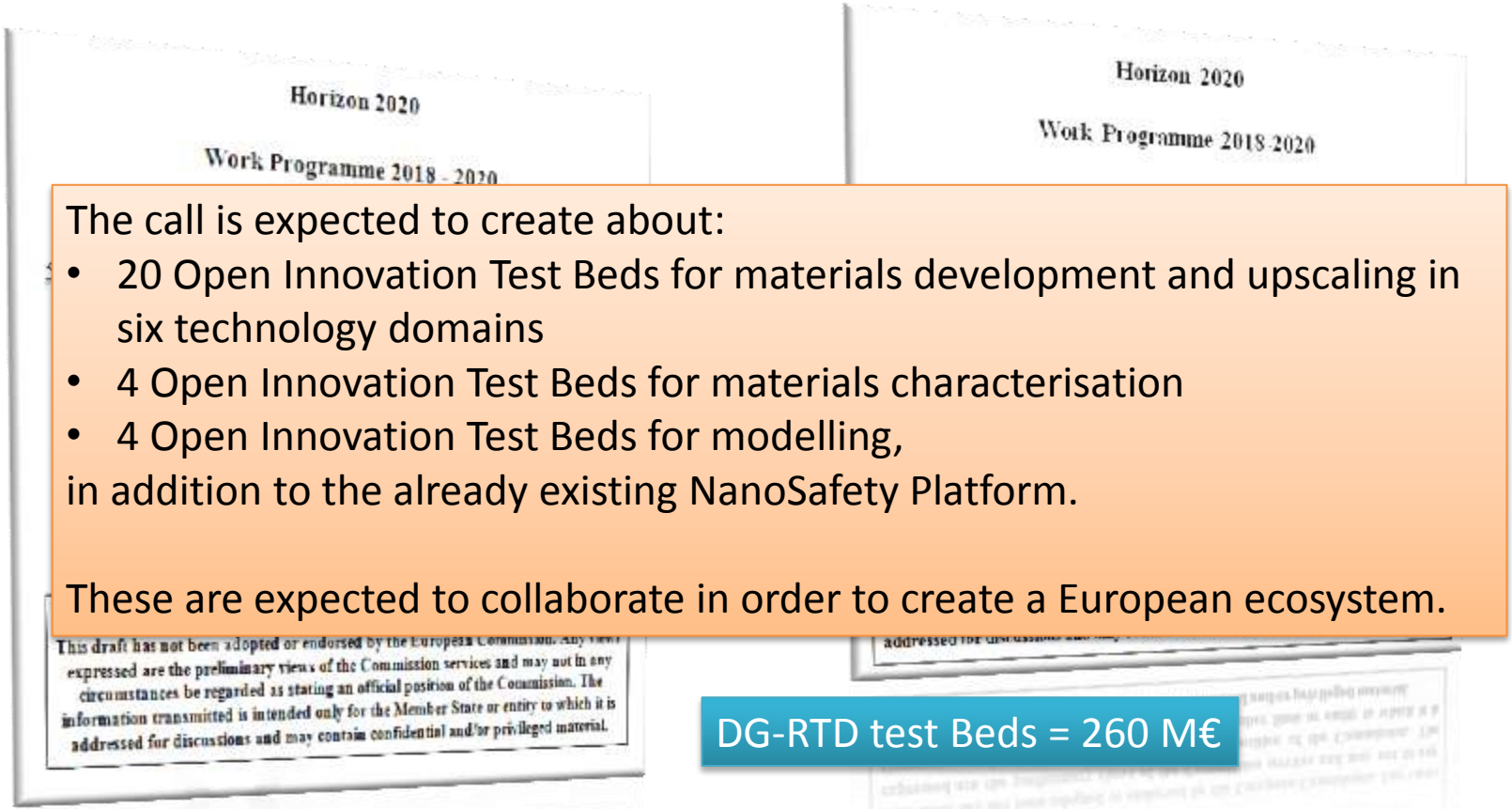
2020

- **DT-NMBP-04-2020: Bio-based**
- **DT-NMBP-05-2020: Building envelopes**
- **DT-NMBP-06-2020: Nano-pharmaceuticals**
- **DT-NMBP-11-2020: Modelling**

- EEMC-CSA - European Materials Modelling Council (2016-mid 2019)
- EPPN –CSA - European Pilot Production Network (2017-2019)
- Nanosafety Cluster

European Commission

Open Innovation Test Beds



The call is expected to create about:

- 20 Open Innovation Test Beds for materials development and upscaling in six technology domains
- 4 Open Innovation Test Beds for materials characterisation
- 4 Open Innovation Test Beds for modelling,

in addition to the already existing NanoSafety Platform.

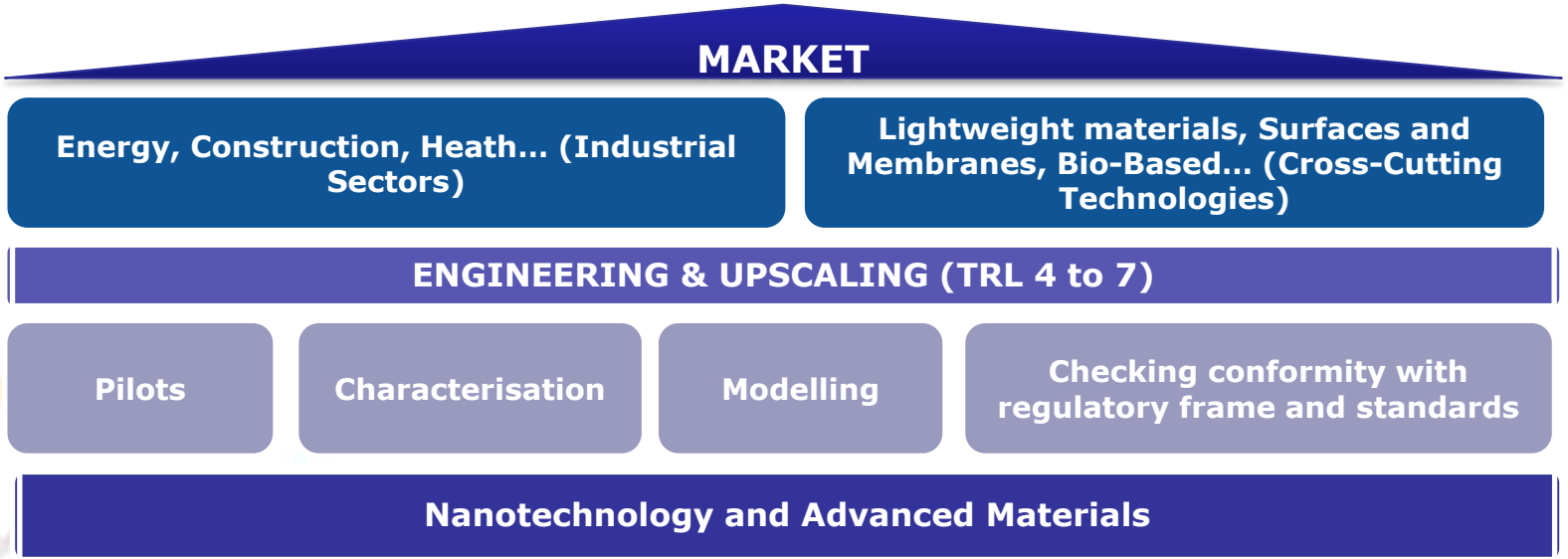
These are expected to collaborate in order to create a European ecosystem.

DG-RTD test Beds = 260 M€

Expected Impact

- **Technological ambitions**, including goals for environmental sustainability, cost reduction, human aspects etc.
- **Take-up of results for industrialisation/commercialisation, including upscaling, investments, addressing different markets**
  - *business cases and exploitation strategies for industrialisation*
- Building **new test/experimentation/validation infrastructure and services**(for SMEs)
- Reach out to **newcomers**(e.g. SMEs) and **civil society**; dissemination goals

Overcoming the Challenge of Upscaling:
Reduction of Technological Risk & attract investments



DG-RTD

Draft FAQ on Open Innovation Test Beds

Which activities of Open Innovation Test Beds will be eligible for funding?

What is the European added value of Open Innovation Test Beds?

Will SMEs outside the project consortium have access to these test beds?

Will the interaction between test beds be an evaluation criteria

How will Open Innovation Test Beds become sustainable once EU funding ends?

How do the test beds interact with other test beds funded under the same topic and with other similar initiatives

Which costs are not eligible?

Who are the potential applicants?

What will "single entry point" mean for the users?

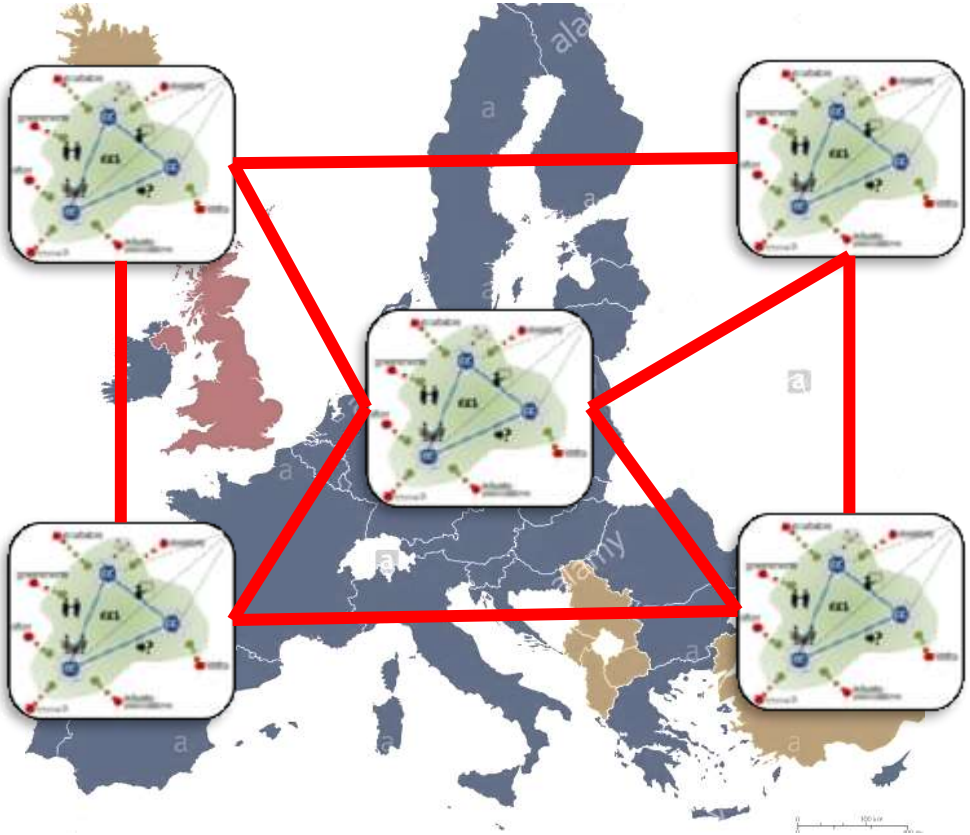
What are the Open Innovation Test Beds for material upscaling, characterisation, modelling, and safety?

How many Open Innovation Test Beds will be funded and in which domains?

What is the link/difference with the Digital Innovation Hubs (DIH)?

What is the link / synergy with regional funding

And so..



1. **Network of ecosystems**
2. **Value Chain**
3. **Services**
4. **Sustainability**

DT-NMBP-01-2018				

Open Innovation Test Beds for Lightweight nano-enabled multifunctional composite materials and components

IA	*Deadline model*	**2 STEPs**	*Budget*	**Between 7 to 15 M€**
	Deadline	**23 Jan 2018 (First Stage)** **28 Jun 2018 (Second Stage)**	*TRL*	**start at TRL 4 and achieve TRL 7**

Int. Coop ☐ ***Cross KET*** ☑ ***SME*** ☑

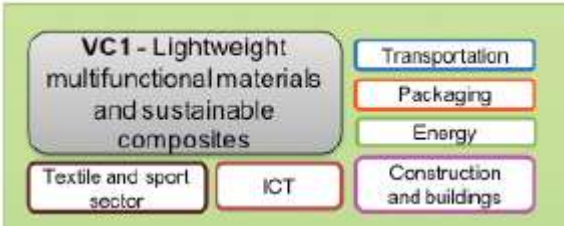
Biotech ☑ Nanotech ☑ Modelling ☑ Pilot ☐ FoF ☐ EEB ☐ SPIRE ☐

DT-NMBP-01-2018	Open Innovation Test beds for Lightweight nano-enabled multifunctional composite materials and components

SRA EuMAT, VALUE4NANO Implementation Roadmap

WG 3: Nanomaterials and Nanostructured Materials for Functional and Multifunctional Applications

WG 4: Knowledge-based Strcutural and Functional Materials



DT-NMBP-01-2018	Open Innovation Hubs for Lightweight nano-enabled multifunctional composite materials and components

Specific Challenge:

• **Establish facilities** for cost effective and sustainable industrial upscaling and deployment of **new** **smart lightweight** and **nanoenabled** **multi-functional** and **environmentally friendly** **materials**,
• **Provide materials** with radically enhanced properties and functionalities, for high-value composite **components and structures** in a wide range of industrial applications.
• **Easily accessible** through open, networked end user entry points
• Tested **in industrial environment** also for **regulatory** constraints
• **Relevance** for a large number of sectors and applications…- e.g. incorporating smart interacting sensors or indicators, .. - e.g. offering enhanced electrical performance, reliability, high-performance thermal and/or electrical conductivity, UV shielding etc…
- all validated on relevant use cases

Scope: …

• Upgrade or develop **materials facilities and processing techniques**
• Available to industry through open access at fair conditions and cost, for enhanced user involvement and accessibility.
• Provide design/modelling, development, characterisation/testing, regulatory and safety assessment, and upscaling services of specific nano-particle/nano-objects based new materials.
• **Demonstrate** with end users in relevant industrial environments.
• Potential **technical, economical and regulatory barriers** considered
• Cover whole materials development chain: **SINGLE ENTRY POINTS**

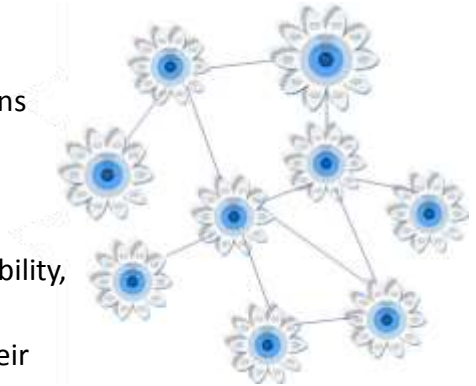
facilitate cooperation, across Europe, with other projects to enhance user involvement;
to ensure the accessibility and reusability of data produced in the course of the project.

SINGLE ENTRY POINT

DT-NMBP-01-2018	Open Innovation Hubs for Lightweight nano-enabled multifunctional composite materials and components

Expected Impact:

- **Open and upgraded facilities** at the EU level easily **accessible to users across different regions of Europe** for the design, development, testing, safety assessment, and upscaling of lightweight, nano-enabled and multifunctional materials and components
- **Attract** a significant number of **new SME users**,
- **Increased access to finance** (for SMEs in particular) for investing in these materials or in applications using them;
- At least **15% improved industrial process parameters** and **20% faster verification of materials performance** for highly promising applications;
- At least **20% improvement in industrial productivity**, reliability, environmental performance, durability, and reduction of life-cycle costs of these materials;
- At least **15% indirect reduction in energy consumption** across sectors using lighter materials in their products and processes.
- **Demonstration** the likelihood of an additional **turnover of at least 4 times the requested EU funding**, within 5 years after the end of the grant.



Reduction of technological risk

EU Regulatory Framework

Proposals for Innovation Actions submitted under this call should include a business case and exploitation strategy

DT-NMBP-02-2018		
Open Innovation Test beds for Safety Testing of Medical Technologies for Health		

IA	*Deadline model*	**2 STEPS**	*Budget*	**Between 7 to 15 M€**
	Deadline	**23 Jan 2018 (First Stage)** **28 Jun 2018 (Second Stage)**	*TRL*	**start at TRL 4 and achieve TRL 7**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☑

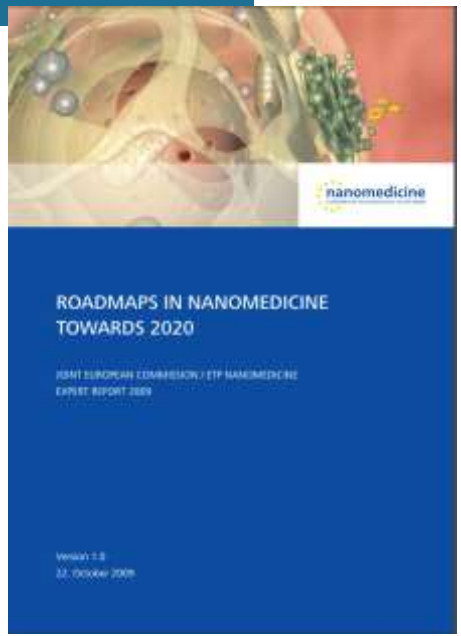
Biotech ☑ Nanotech ☑ Modelling ☐ Pilot ☐ FoF ☐ EEB ☐ SPIRE ☐

DT-NMBP-02-2018	Open Innovation Test Beds for Safety Testing of Medical Technologies for Health

European Technology Platform and the Pilot projects associated

nanomedicine
EUROPEAN TECHNOLOGY PLATFORM

EUNCL
Nanomedicine Characterisation Laboratory



DT-NMBP-02-2018	Open Innovation Test beds for Safety Testing of Medical Technologies for Health

Specific Challenge:

- to **provide companies and users** in Medical technology **access to affordable and advanced testing facilities** and services to facilitate the development of new and safe medical technologies.
- To preserve timely **access to innovative healthcare solutions** and support the competitiveness of the European industry, testing facilities support services are needed to help industry and users develop and test medical devices in compliance with **new EU safety regulations** (medical devices and in-vitro diagnostics new set of rules to improve the safety of medical devices for the benefit of patients).
- A bonus would be to define new methodologies for clinical testing, when relevant.

Scope:

- **upgrade or develop materials facilities** and make available to industry and interested parties, including SMEs, services for the design, development, testing, safety assessment, and **upscaling of new/existing medical devices** in compliance with **EU regulatory frameworks** since the beginning of the development process;
- develop **methodologies to accelerate and simplify the subsequent pre-clinical and clinical testing** in accordance with EU rules;
- Potential regulatory, economic, organisational and technical **barriers** should be **identified and assessed**.
- Considerations regarding risk-assessment procedures that take into account potential gender differences should be considered;
- **Open access at fair conditions** and cost as well as outreach and dissemination across Europe, based on a distinct methodology;
- **Quality control processes** and tools should be validated to allow on-line quality controls;
- Medical devices should be demonstrated in relevant industrial environments.

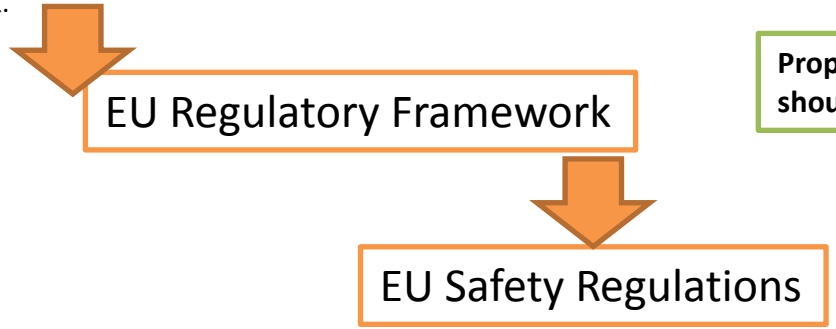
SINGLE ENTRY POINT

facilitate cooperation, across Europe, with other projects to enhance user involvement;
to ensure the accessibility and reusability of data produced in the course of the project.

DT-NMBP-02-2018	Open Innovation Test beds for Safety Testing of Medical Technologies for Health

Expected Impact

- **Open and upgraded facilities** at the EU level easily **accessible to users across different regions of Europe** for the design, development, testing, safety assessment, and upscaling of lightweight, nano-enabled and multifunctional materials and components
- **Attract** a significant number of **new SME users**,
- **Increased access to finance** (for SMEs in particular) for investing in these materials or in applications using them;
- Cost effective, innovative, and safe healthcare medical devices in compliance with **EU safety regulations**;
- Faster assessment of new medical devices' compliance with **EU safety regulations**;
- **Reduced time to market of new medical devices** (earlier determination of safety profile and facilitation of subsequent pre-clinical and clinical testing);
- Indirect substantial benefits for European citizens' safety and **access to new and innovative medical products**;
- **New market opportunities** for providing services to non-EU players interested in testing facilities to ensure compliance with EU regulatory frameworks for their export products to Europe.
- **Demonstration** the likelihood of an additional **turnover of at least 4 times the requested EU funding**, within 5 years after the end of the grant.



Proposals for Innovation Actions submitted under this call should include a business case and exploitation strategy

DT-NMBP-03-2019		

Open Innovation Test Beds for nano-enabled surfaces and membranes

IA	*Deadline model*	**2 STEPS**	*Budget*	**Between 7 to 15 M€**
	Deadline	**23 Jan 2018 (First Stage)** **28 Jun 2018 (Second Stage)**	*TRL*	**start at TRL 4 and achieve TRL 7**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☑

Biotech ☑ Nanotech ☑ Modelling ☐ Pilot ☐ FoF ☐ EEB ☐ SPIRE ☐

DT-NMBP-03-2019	

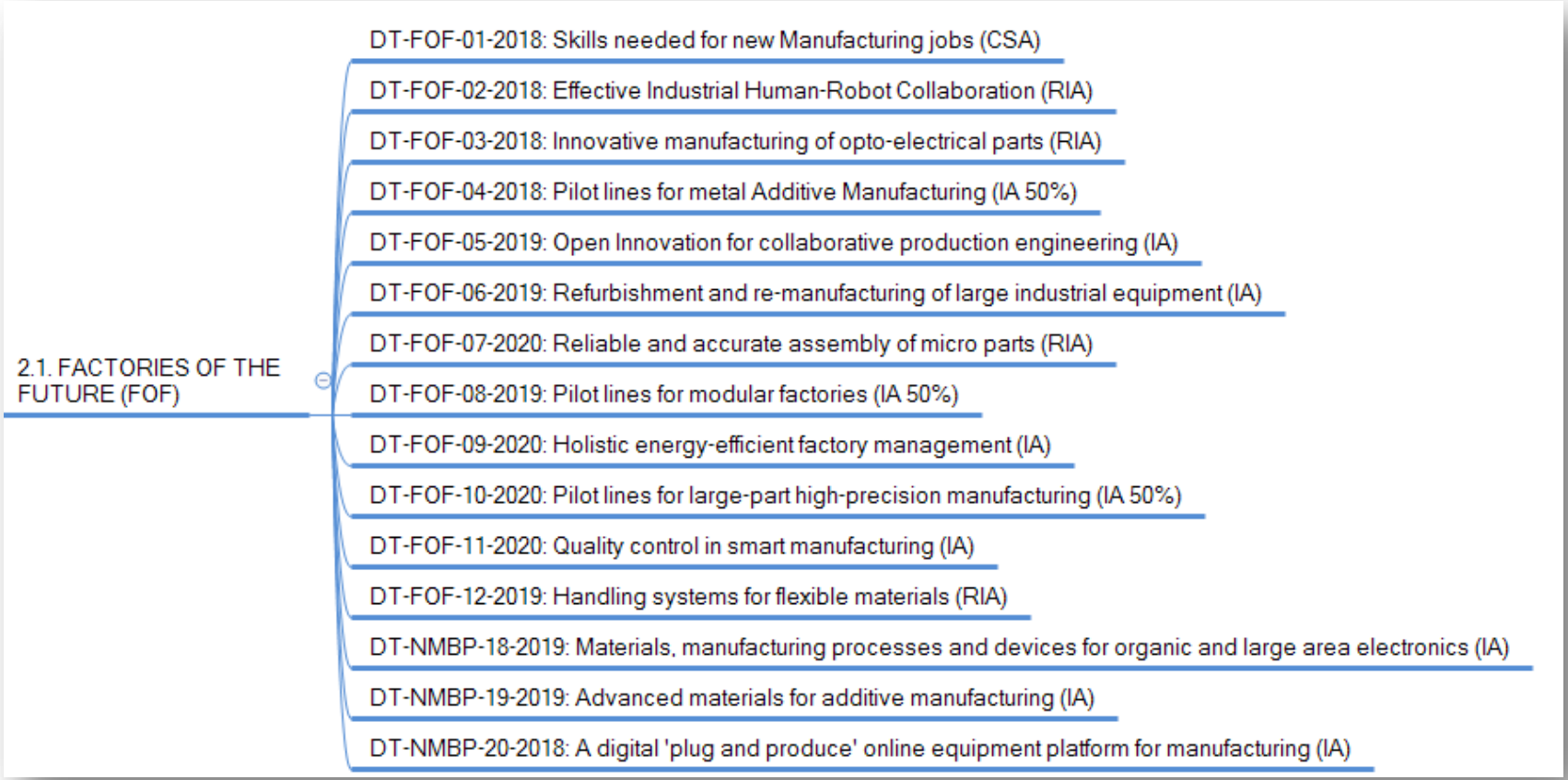
Specific Challenge: …. The challenge is to enable a cost effective and sustainable industrial upscaling and deployment of nano-enabled surface and membrane technologies, including thin film architecture, coating, surface structuration for improved properties (optical, surface energy, durability, reduced friction, etc.), and nanostructured membrane's functionalities. This will require the **integration of state-of-the-art nano-scale processes for modification, functionalisation, and structuring/coating of surfaces or membranes**.

Scope:

- Open Innovation Test Beds should **upgrade or develop materials facilities** and make available to industry and interested parties, including SMEs, services for the design, development, testing, safety assessment, and upscaling …
- New materials functionalities may include, among others, improved scratch and abrasion resistance, super hardness and mechanical resistance, improved corrosion, wear and friction properties, bio-functionality, bio-compatibility, control of reflectivity, sensing ability, self-cleaning, antimicrobial, permeability and selectivity properties;
- Open access at fair conditions and cost as well as outreach and dissemination …, based on a distinct methodology;
- Applications can cover industrial as well as consumer products. Potential regulatory, economical and technical barriers should be identified and assessed;
- Quality control processes and tools should be validated to allow on-line quality controls;
- Materials should be demonstrated in relevant industrial environments;.

Proposals submitted under this topic should include actions designed to facilitate cooperation, across Europe, with other projects and existing Pilot Lines; to enhance user involvement; and to ensure the accessibility and reusability of data produced in the course of the project.

What do we have in FOF?



DT-FoF-01-2018		
Skills needed for new Manufacturing jobs		

CSA	*Deadline model*	**1 step**	*Budget*	**EUR 2 million**
		22 Feb. 2018	*TRL*	**n.a.**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☐

Biotech ☐ Nanotech ☐ Materials ☐ Pilot ☐ FoF ☑ EEB ☐ SPIRE ☐

DT-FoF-01-2018	**Skills needed for new Manufacturing jobs**
SRA and projects/project ideas portal	

DT-FoF-01-2018	**Skills needed for new Manufacturing jobs**

- Specific Challenge:
  - Breakthrough education and training paradigms for continuous training of the existing workforce are needed, … develop new skills and competences …. …, both women and men, … increasingly sophisticated machines and new technologies.
  - … need to strengthen human capital, employability and competitiveness ... The Blueprint for Sectoral Cooperation on skills is one of the ten actions in this Agenda. … beyond **Additive Manufacturing** within several areas … priorities.
- Scope:
  - Identify shortages and mismatches in technical and non-technical skills, knowledge and competences…
  - Map the most relevant existing **national initiatives** … in order to develop an **EU wide strategy**;
  - Put in place activities related to lifelong learning and granting of qualification … Develop .. **scenarios**…
  - Innovative and hands-on approaches, including **SSH** elements… through training activities and knowledge management with … **senior** employees. On-site, modular and e-learning education …
  - Exchange of information between … at European scale. Proposals … to seek **synergies** with…
- Expected Impact
  - Real and measurable steps towards … At least 15 new job profiles …. Close and continuous engagement with stakeholders

DT-FoF-02-2018		

Effective Industrial Human-Robot Collaboration

RIA	*Deadline model*	**1 step**	*Budget*	**between EUR 6 and 8 million**
		22 Feb 2018	*TRL*	**start at TRL 4 and achieve TRL 6**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☐

Biotech ☐ Nanotech ☐ Materials ☐ Pilot ☐ FoF ☑ EEB ☐ SPIRE ☐

DT-FoF-02-2018	**Effective Industrial Human-Robot Collaboration**

SRA and projects/project ideas portal

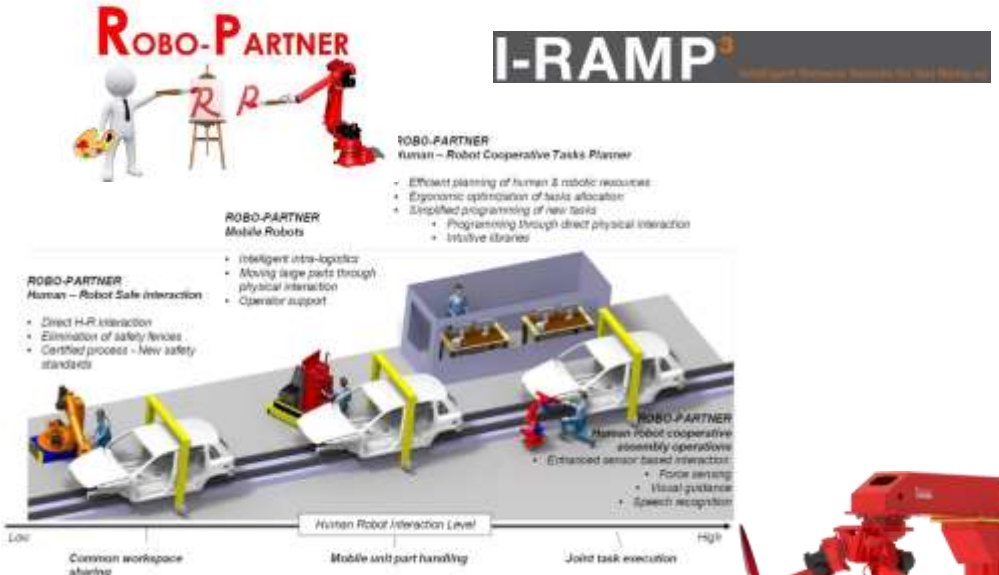
EFFRA Innovation Portal

EUnited Robotics – European Robotics Association

SPARC – The Partnership for Robotics in Europe

ROBO-PARTNER

I-RAMP



X-act

DT-FoF-02-2018	Effective Industrial Human-Robot Collaboration

Specific Challenge: … Past research … concentrated largely on safety of humans, allowing workers and robots to share working space without fences. … existing industrial robotic arms … make it safe for humans … … genuine collaboration between humans and robots require more holistic solutions encompassing smart mechatronic systems designed to improve the quality of the job performed .. increase flexible production…

- move from a structured factory floor where robots work behind closed fences to an open environment with smart mechatronic systems and humans collaborating closely, interdisciplinary research in the fields of robotics, cognitive sciences and psychology is required, also taking into account regulatory aspects. More attention … to develop novel inherently-safe robotic concepts where collaboration with humans is taken up already in the design phase. In order for effective HRC to be taken up by industry, beyond safety aspects, including ergonomics, adaptability, liability issues, inclusiveness of vulnerable workers, acceptability and feedback from users need to be considered in a holistic way.

Scope: Proposals need to extend the current state of the art of individual HRC to work environments ….

Proposals should cover two of the following three areas:

- Integration … of novel human-centred designed smart mechatronic systems such as for example soft robotics for high payloads;
- Implementation of novel artificial intelligence technologies … massive information processing and reacting in real-time to enable new levels of autonomy, navigation, cognitive perception and manipulation for robots to collaborate with humans in the process;
- Development of methods for robotic hazard assessment and risk management to clarify trade-offs between productivity and safety for mixed human-robot smart devices environments.

Proposals need also to take into account Social Sciences and Humanities (SSH) elements …. such as ergonomics, user experience, comfort, trust, feeling of safety and liability in modern production facilities, taking into account age and gender aspects.

Proposals … should include actions designed to facilitate cooperation with other projects; … user involvement; … accessibility and reusability of data …

DT-FoF-03-2018		

Innovative manufacturing of opto-electrical parts

RIA	*Deadline model*	**1 step**	*Budget*	**between EUR 6 and 8 million**
		22 Feb 2018	*TRL*	**start at TRL 4 and achieve TRL 6**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☐

Biotech ☐ Nanotech ☐ Materials ☐ Pilot ☐ FoF ☑ EEB ☐ SPIRE ☐

DT-FoF-03-2018	Innovative manufacturing of opto-electrical parts

Specific Challenge: Optoelectronics and opto-electrical components in… are used in parts such as lasers, photodiodes, image sensors, optical amplifiers, modulators, solar cells, embedded optics and light-emitting diodes.

Previous research led …. 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 … 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.

Scope: Proposals need to **present 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. 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. 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**.

DT-FoF-04-2018		
Pilot lines for metal Additive Manufacturing		

IA (50%)	*Deadline model*	**1 step**	*Budget*	**between EUR 12 and 15 million**
		22 Feb 2018	*TRL*	**start at TRL 5 and achieve TRL 7**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☐

Biotech ☐ Nanotech ☐ Materials ☐ Pilot ☐ FoF ☑ EEB ☐ SPIRE ☐

DT-FoF-04-2018	**Pilot lines for metal Additive Manufacturing**
	SRA and projects/project ideas portal

AM PLATFORM European Technology Platform in Additive Manufacturing

- **HiPr – 2012-2015:** High-Precision micro-forming of complex 3D p primary goal of HiPr is to develop and integrate all necessary base which create the basis to control and monitor the condition of mi complex high-precision 3D parts.
- **SASAM – 2012-2014:** Support action for standardisation in AM. SASA to drive the growth of AM to efficient and sustainable industrial integrating and coordinating Standardisation activities for Europe by supporting a Standardisation organisation in the field of AM.
- **AEROBEAM 2012-2013:** Direct Manufacturing of stator vanes thr beam melting. Aerobeam is aimed at increasing the TRL of investigation of recyclability of EBM powder and the mechanical aeronautical Ti6Al4V stator vanes elaborated by EBM, an AM Technic
- **NANOMASTER – 2011-2015:** Graphene based thermoplastic mast conventional and AM processes. The aims of the project are to redu of plastic used to make a component.
- **MERLIN – 2011-2014:** Development of Aero Engine Component Man Laser AM. The concept of the MERLIN project is to reduce the environ of air transport using AM techniques in the manufacture of civil aero en
- **HIRESEBM – 2011-2013:** High resolution electron beam melting w developing an electron beam melting (EBM) AM process to enable the high resolution medical implants with optimised porous structures direc powder.
- **ADM-ERA – 2011-2013:** Reinforcing AM research cooperation betwe

MANUFUTURE-EU

AM-motion
Because AM matters

EUROPEAN NETWORKS

AM PLATFORM	AM platform: European Technology sub-Platform on Additive Manufacturing
EWF	EWF: European Welding Federation for Welding, Joining, and Cutting
fedra	FEDRA: Federation of Regional Actors in Europe
MANUFUTURE-EU	MANUFUTURE: European Technology Platform on competitive and sustainable manufacturing
VANGUARD INITIATIVE	Vanguard Initiative: New growth through smart specialisation

INTERNATIONAL ENTITIES

AATiD	AATiD: Advanced Additive Titanium Development Consortium
MADiT	MADiT: Mexican National Laboratory of Additive Manufacturing 3D Digitalization and Computed Tomography
WOMEN IN 3D PRINTING	Women in 3D Printing

NATIONAL OR REGIONAL CLUSTERS AND NETWORKS

ADDIMAT	ADDIMAT: Additive & 3D Manufacturing Technologies Association of Spain
CRITT	CRITT-MDTS: Regional Centre for Innovation an Technology Transfer
Céramique	Ceramic European Cluster
FEDERATION DE LA PLASTURGIE ET DES COMPOSITES	Federation of Plastics and Composites sector
matikem	Matikem: Cluster of materials, innovation and green chemistry
m2i	M2i: Materials Innovation Institute
TCS	TCS: Toolmakers clusters of Slovenia

A large community:

INDUSTRY

ACITURRI	Aciturri Additive Manufacturing
ALSTOM	Alstom Transp
crit	CRIT
eos	EOS
esi get it right	ESI Group
GRANTA	Granta Design L
HILTI	HILTI
MONDRAGON	MONDRAGO Corporation S.
SAFRAN	Safran Tech
SCHUNK	Schunk
SWAROVSKI	Swarovski

UNIVERSITIES AND RTOs

aiju	AIJU: Technological Institute for children's products & leisure
Brunel University London	Brunel University Lo
CSM	CSM: Centro Sviluppo Materiali
eurecat	EURECAT
IK4 TEKN	IK4 TEKNIKER
inspire	Inspire icams: Innov Center for Additi Manufacturing Switzerland
ITAINNOVA	ITAINNOVA: Technological Institute of Aragon
LMS	Laboratory for Manufacturing Sys & Automation - University of Pat
PROFACTOR	PROFACTOR
UNIVERSITY OF BIRMINGHAM	University of Birmin
DMRC	University of Paderborn

OTHER

ALEXANDER DANIELS	Alexander Daniels Global
Berenschot	Berenschot
European IPR Helpdesk	European IPR Helpdesk

DT-FoF-04-2018	**Pilot lines for metal Additive Manufacturing**

Specific Challenge: **Costs** and **unpredictable defects** in final parts and products are preventing complete deployment and adoption of Additive Manufacturing (AM) 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.

Scope:

- Multi-scale and multi-physics simulations of the process and of the whole system from the early design phase, to avoid costly trial and error runs. The prediction and minimisation of distortion and their effect on durability and expected lifetime for post processing steps will also avoid propagation of defects to downstream stages;
- In-line non-destructive testing and in-situ analysis of product, including metrology aspects;
- 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 manufacturing and assembling processes;
- Certification, regulatory and standardisation activities related to the proposed solutions and parts;
- Occupational **exposure** in terms of health, safety and environment should be carefully observed together with the recycling of unused materials.

Proposals are expected to cover demonstration activities driven by the **industrial community**.

DT-FoF-05-2019		

Open Innovation for collaborative production engineering

IA	*Deadline model*	**1 step**	*Budget*	**between EUR 4 and 6 million**
		21 Feb 2019	*TRL*	**start at TRL 4 and achieve TRL 6**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☐

Biotech ☐ Nanotech ☐ Materials ☐ Pilot ☐ FoF ☑ EEB ☐ SPIRE ☐

DT-FoF-05-2019	**Open Innovation for collaborative production engineering**

SRA and projects/project ideas portal

EFFRA Innovation Portal

ActionPlanT
Factories of the Future

DT-FoF-05-2019	Open Innovation for collaborative production engineering

Specific Challenge: The transfer to industrial companies of the Do It Yourself (DIY), **fablabs**, micro-factories and makers approaches can pioneer ways towards engineering solutions throughout the whole value chain. These innovative methods can lead to new processes, machines and products with **new functionalities and shorter time to market**.

Industry is **not yet widely** using such innovative approaches to **engage consumers** and respond to societal needs, also taking into account the individual preferences of women and men. Collaborative production liaising companies, especially SMEs, with these new approaches can however **create Open Innovation networks** that can unroll a wide range of entirely **new business** opportunities for the benefit of **consumers**.

Scope: Proposals should particularly **cover consumer-goods sectors** and couple design, creativity and knowledge with a customer-driven production. The co-creation of products in both ends of the value chain represents customer involvement in the production. In particular, proposals should cover at least three out of the following areas:

- … approaches to **capitalise on the knowledge and ideas of design and engineering** coming from different and even new actors;
- **Design of new strategies** based on creative and agile methodologies for analysis;
- Development of **knowledge, technologies and tools to share and analyse relevant data and demands** from users as well as to fully enable collaborative engineering in the production network, allowing all actors to propose innovative solutions;
- Development of **open source product data exchange and standard representations** of products and processes that ensure the compatibility of modelling and simulation with different process information systems;
- Development of **new Manufacturing Demonstration Facilities (**MDFs), where companies will test new technologies in cooperation with fablabs and makers in order to develop real industrial products and where training is offered.

Proposals also need to take into account Social Science and Humanities aspects regarding creativity.

Proposals … should include actions designed to facilitate cooperation with other projects; … user involvement; … accessibility and reusability of data …

DT-FoF-06-2019		
Refurbishment and re-manufacturing of large industrial equipment		

IA (50%)	*Deadline model*	**1 step**	*Budget*	**between EUR 12 and 15 million**
		21 Feb 2019	*TRL*	**start at TRL 5 and achieve TRL 7**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☐

Biotech ☐ Nanotech ☐ Materials ☐ Pilot ☐ FoF ☑ EEB ☐ SPIRE ☐

DT-FoF-06-2019	Refurbishment and re-manufacturing of large industrial equipment

SRA and projects/project ideas portal

https://www.spire2030.eu/projects/our-spire-projects

EFFRA Innovation Portal

ActionPlanT
Factories of the Future

DT-FoF-06-2019	**Refurbishment and re-manufacturing of large industrial equipment**

- Specific Challenge: ..**lifetime extension** can limit high replacement costs of major industrial infrastructures. …….. achieved through refurbishment, re-manufacturing, re-use, upgrading, in-situ repair, improved maintenance and more conservative utilisation of large industrial equipment …….. **extend the useful life of heavy machinery**, and **improve the return on investment** …
- Scope: This topic is for demonstration projects to **establish the feasibility of lifetime extension of large industrial equipment** of the kind used in manufacturing, including modernisation of equipment for data collection and interfaces.
- The scope covers large-scale electrical and/or mechanical machinery in plants rather than electronic equipment, which earlier projects have already covered. Demonstration activities need to take place in **real industrial settings** and include validation of at least **two industrial demonstrators in different sectors**, enabling the integration and scale-up of the parameters to other industrial environments.

Efficiency > at least 10%

Life time extension > at least 20%

Increased return on investment

Relevant indicators and metrics, with baseline values

DT-FoF-08-2019		
Pilot lines for modular factories		

IA (50%)	*Deadline model*	**1 step**	*Budget*	**between EUR 12 and 15 million**
		21 Feb 2019	*TRL*	**start at TRL 5 and achieve TRL 7**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☐

Biotech ☐ Nanotech ☐ Materials ☐ Pilot ☐ FoF ☑ EEB ☐ SPIRE ☐

DT-FoF-08-2019	**Pilot lines for modular factories**

SRA and projects/project ideas portal

EFFRA Innovation Portal

AUTORECON

ReconCell

PERFoRM

PERFoRM - Production harmonizEd Reconfiguration of Flexible Robots and Machinery

FieldLab Flexible Manufacturing

flexible and fully automized production of small series by robots and based on zero-programming

ITMAN

Future Internet Technologies for MANufacturing industries

DT-FoF-08-2019	Pilot lines for modular factories

Specific Challenge: **Rapid changes** in a production line require a significant **flexibility** of reconfiguration. **Modular production equipment** can create highly adaptable production lines to enable efficient production of small series tailored to customer demands. Previous research … modularity can be at two levels, … **complete machines** with their own interface and material handling system or as interchangeable **tool heads**. In both cases, the advantage of modularity should be **demonstrated by the ease of use and plug-and-produce features** allowing for rapid modification.

The functionality of the modules should enable the production of the widest variety of complex products. The modules need to allow rapid physical rearrangements, through either automated processes or manual intervention; and have accessible, secure interfaces in order to be connected to a common data system for production control. The interfacing with the existing hardware and legacy software is another aspect that needs to be covered.

Scope: Proposals are expected to **start from existing test beds** that are flexible enough to allow for the introduction of multiple modular process units. Proposals should cover **all of the following areas**:

- The development of a range of production modules covering several different disciplines …. taking into account safety aspects;
- The integration of comprehensive production management systems, including real-time process control in a reconfigurable line, which includes considerations for data interoperability between modules and process line;
- Pilot production of different products covering processing technologies and features such as multi-functionality (mechanical, electrical, thermal, optical, etc.), multi materials, and complex shapes.

The production modules could be considered as demonstrators on their own. However, their integration in the pilot line … should be achieved before the end of the project.

Proposals are expected to cover demonstration activities driven by the **industrial community**

DT-FoF-12-2019		
Handling systems for flexible materials		

RIA	*Deadline model*	**1 step**	*Budget*	**between EUR 6 and 8 million**
		21 Feb 2019	*TRL*	**start at TRL 4 and achieve TRL 6**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☑

Biotech ☐ Nanotech ☐ Materials ☐ Pilot ☐ FoF ☑ EEB ☐ SPIRE ☐

DT-FoF-12-2019	**Handling systems for flexible materials**

SRA and projects/project ideas portal

DT-FoF-12-2019	**Handling systems for flexible materials**

Specific Challenge: The handling of soft materials with the involvement of robots remains limited. The **control systems of the robot need to be very sensitive, accurate and fast to prevent unwanted irreversible deformations and damages**. … **develop handling devices which are not pre-programmed for one specific task, but are intelligent and universally dexterous**.

Future robots will have to be able to handle soft products while controlling their level of deformation, … Low-cost robots are essential. New handling technologies for flexible materials will lead to disruptive innovations in textile, paper and food processing, and will support a widespread implementation, in particular by **SMEs**.

Scope: In order to automate production processes involving soft and flexible materials, Proposals need to cover both of the following areas:

- Innovative technologies for the handling of the soft and flexible materials such as gripping, moving, positioning, sorting, joining etc. so that it can be included in larger automated production processes. **Low-cost and universal dexterity are key concepts**;
- System solutions that can manage **all product and material related data** (size, shape, weight, colour, material composition, defects, etc.), so that their automated handling can be embedded in larger production and process management systems.

For 2020

- They are only known by their title…
  - **DT-FOF-07-2020: Reliable and accurate assembly of micro parts (RIA)**
  - **DT-FOF-09-2020: Holistic energy-efficient factory management (IA)**
  - **DT-FOF-10-2020: Pilot lines for large-part high-precision manufacturing (IA 50%)**
  - **DT-FOF-11-2020: Quality control in smart manufacturing (IA)**
- They will be defined in the next months

DT-NMBP-18-2019		

Materials, manufacturing processes and devices for organic and large area electronics

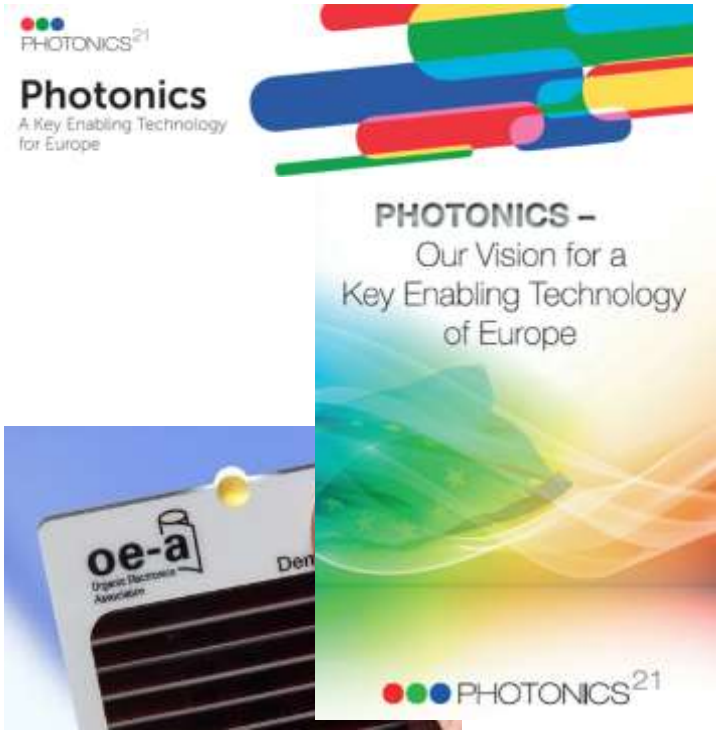
IA	*Deadline model*	**2 stages**	*Budget*	**co-funded LEIT-NMBP and LEIT-ICT, for a total budget of EUR 20 million.**
	22 Jan 2019	**3 Sept 2019**	*TRL*	**start at TRL 3 and achieve TRL 5**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☐

Biotech ☐ Nanotech ☐ Materials ☑ Pilot ☐ FoF ☐ EEB ☐ SPIRE ☐

DT-NMBP-18-2019	Materials, manufacturing processes and devices for organic and large area electronics

A very large set of actors across Europe…



DT-NMBP-18-2019	Materials, manufacturing processes and devices for organic and large area electronics

Specific Challenge: Europe is a leader … or organic and large area electronics (OLAE) but the materials ….. improved to maintain this position. In addition, … combine dissimilar manufacturing technologies in order to achieve seamless integration of the new technology into traditional products at constant/lower production cost and in a **new generation of smart devices**.

Scope: Activities should include **material development and improvement** (electrical performance, processability, stability and lifetime during device operation), as well as **prototyping** of advanced OLAE based electronic products. New materials/process development should **cover all** …:

- Combine materials with high uniformity / mobility in industrial quantities with high reproducible quality;
- Improved environmental stability to enable operation in more robust environments
- Seamless integration of the new technology into traditional and new products;
- Advance the TRL of OLAE and enhance its manufacturability including high speed processes for the integration of flexible OLAE components onto flexible substrates;
- Cost reduction for the structuring and processing of organic electronic materials into device structures;
- Demonstration of OLAE-enabled prototypes in **selected applications of flexible and wearable electronics**.

DT-NMBP-19-2019		

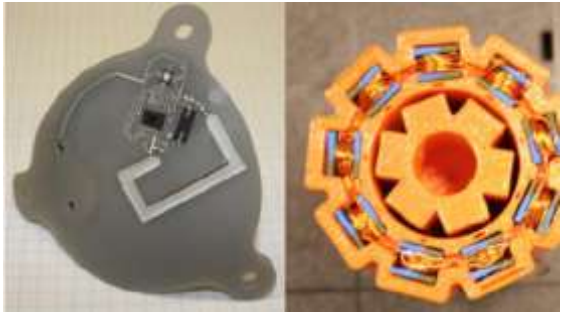
Advanced materials for additive manufacturing

IA	*Deadline model*	**2 stages**	*Budget*	**between EUR 6 and 8 million**
	22 Jan 2019	**03 Sep 2019**	*TRL*	**start at TRL 4 and achieve TRL 6**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☐

Biotech ☐ Nanotech ☐ Materials ☑ Pilot ☐ FoF ☐ EEB ☐ SPIRE ☐

DT-NMBP-19-2019	Advanced materials for additive manufacturing



Helmet

Motor in-process

DT-NMBP-19-2019	Advanced materials for additive manufacturing

Specific Challenge: Additive manufacturing (AM) is now applied in the processing …. different levels of industrial readiness. The **challenge** is to develop equipment that allows the additive layer manufacturing of **multi-materials items** and **multi-functional materials** (for research, transport including aeronautic, consumer customised goods, communications, biomaterials and energy).

The development of novel materials is a primary challenge in the future development of AM. The challenge is **also to use nanotechnologies** to aggregate multiple materials within a single process, while improving or expanding their **functionality**, and **enhancing their performance**. … include optical, rheological, mechanical, RF, electrical, magnetic, surface, thermal or process properties, controlled release, durability … and quality.

Scope: By combining several materials, proposals should **advance the state of the art through the development of ready assembled multifunctional devices**. Proposals should demonstrate several simultaneous activities:

- Quantification of improved functionalities, properties, quality and lifespan of fabricated pieces;
- Evaluation of matching materials properties to the production process to enable the joining of dissimilar materials for AM tools;
- Demonstration of a better understanding of the nanotechnology integrated materials properties and manufactures;
- Integration and validation at early stage of the qualification and certification considerations of the materials;
- Joint development with material suppliers and end-users is required for a rapid uptake by industry;
- Modelling, standardisation and regulatory aspects (especially safety and nanosafety) and the process and materials qualification.

DT-NMBP-20-2018		

A digital 'plug and produce' online equipment platform for manufacturing

IA	*Deadline model*	**1 stage**	*Budget*	**fixed lump sum of EUR 7.5 million**
		8 Mar 2018	*TRL*	**start at TRL 5 and achieve TRL 7**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☑

Biotech ☐ Nanotech ☐ Materials ☐ Pilot ☐ FoF ☑ EEB ☐ SPIRE ☐

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

Platforming – B2B – Market place

EFFRA Innovation Portal

Workshop Report Published: Digital Manufacturing Platforms for Connected Smart Factories

Digitising European Industry

Strengthening competitiveness in digital technologies value chains and platforms

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

Specific Challenge: … is its abundance of SME equipment manufacturers with the capability to offer world-class products … . 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 needs to be developed and set up for use on the market**.

Scope: (**a**) **design and build the digital platform** that brings together suppliers and users in a transparent and efficient way; and **(b**) **populate** it with adequate product information. This will constitute a set of pilot implementations intended to sell 'plug and produce' industrial equipment and services … . The platform … **facilitate B2B transactions and host associated services** in the form of digital product models … **simulate** (e.g. digitally test) the capabilities of the equipment on offer and its **compliance to standards**. This will ultimately … based on **Return on Experience** The digital platform should..:

- Transparency of product features, capabilities, resource use, associated add-on services and price;
- Customer feedback, real-time use feedback (anonymised as needed) and associated options;
- Scalability with respect to technological development and manufacturing application domains;
- Information about standards and regulatory compliance (e.g. the facilitation of re- and de-manufacturing) as well as security requirements.
- SSH elements should cover issues such as business model/ownership economics … . Work … user interface aspects to encourage active customer feedback.

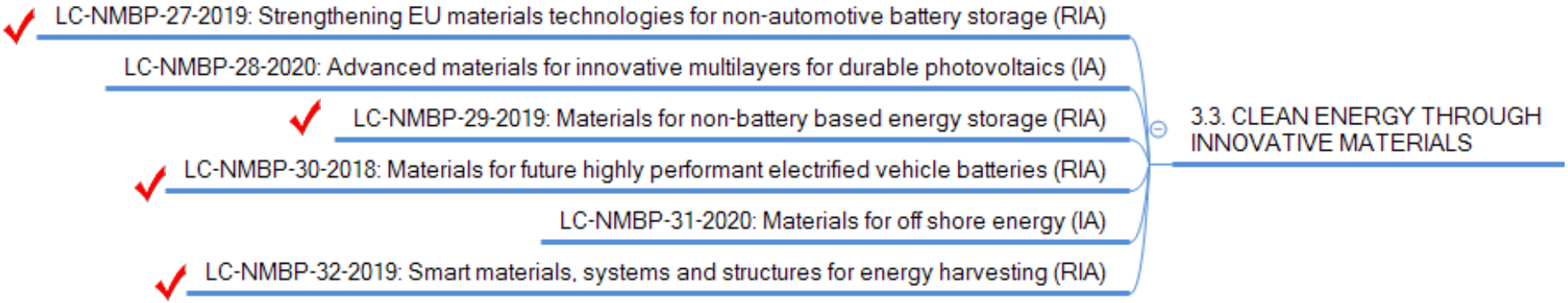
Activities under (b) include the incorporation of suppliers or users of the equipment pilots and/or developers of additional applications and services where appropriate. **Beneficiaries may provide support to third parties** …. The support to third parties can only be provided in the form of lump sums. The respective options of Article 15.1 and Article 15.3 of the Model Grant Agreement will be applied.

Each consortium will define the selection process of the third parties for which financial support will be granted. The typical amount per party shall be in the order of EUR 50 000 to 100 000, …. Around one third of the EU funding requested … shall be allocated to … support to third parties.

Proposals submitted under this topic should include actions designed to facilitate cooperation with other projects; to enhance user involvement; and to ensure the accessibility and reusability of data produced in the course of the project.

… It is recommended to also use established networks reaching out to SMEs like the Enterprise Europe Network and the NCP network for calls… .

What do we have about materials



LC-NMBP-27-2019		

Strengthening EU materials technologies for non-automotive battery storage (RIA)

RIA	*Deadline model*	**2 stages**	*Budget*	**between EUR 6 and 8 million**
	22 Jan 2019	**03 Sep 2019**	*TRL*	**start at TRL 4 and achieve TRL 6**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☐

Biotech ☐ Nanotech ☐ Materials ☑ Pilot ☐ FoF ☐ EEB ☐ SPIRE ☐

LC-NMBP-27-2019	Strengthening EU materials technologies for non-automotive battery storage

LC-NMBP-27-2019	Strengthening EU materials technologies for non-automotive battery storage

Specific Challenge: … The respective energy supply will be much more decentralised, resulting in enhanced needs for deployment of large to small scale industrial electricity grids, and in an increased share of electricity produced in private households. Also industry 4.0 … will need a more delocalised energy supply. … For all these new technologies and markets, the respective energy storage challenges have to be solved… by specific batteries, and Europe has to use its knowledge and competitive advantage in advanced materials and nanotechnologies … .

Scope: Proposals should cover the following:

- Develop more price competitive, better performant and highly safe battery storage solutions, with improved lifetime by lowering the cost and capital expenditure through development of less expensive and more performant materials (e.g. novel advanced electrode materials, including nanostructured and 2D materials and electrolytes), chemistries, packaging and cell design and battery component production processes. … Synergies with the electrified vehicle battery production sector could be explored;
- Duly consider safety aspects depending on the application, e.g. by consideration of polymer or solid electrolytes for solid-state batteries;
- Sustainable materials and environmental friendly production processes, possible second life applications, and materials that are easily available in Europe, in order to avoid market dependence. Recycling should be inherently possible on a large scale… ptance;
- The new solution and respective output targets (such as cyclability, reliability, usage and lifetime) should be demonstrated and **tested where possible in a relevant industrial environment**; and developments in the **European regulatory framework** as well as the impact on industrial standards should be considered
- To allow comparison with currently existing solutions, a full life cycle assessment covering environmental and economic aspects of the proposed alternatives should be included.

LC-NMBP-29-2019		

Materials for non-battery based energy storage

RIA	*Deadline model*	**2 stages**	*Budget*	**between EUR 4 and 6 million**
	22 Jan 2019	**03 Sep 2019**	*TRL*	**start at TRL 3 and achieve TRL 5**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☐

Biotech ☐ Nanotech ☐ Materials ☑ Pilot ☐ FoF ☐ EEB ☐ SPIRE ☐

LC-NMBP-29-2019	Materials for non-battery based energy storage

LC-NMBP-29-2019	Materials for non-battery based energy storage

Specific Challenge: …. **Batteries may not be the best solution** to face all energy storage needs, due to cost, safety and environmental issues. **Other technologies have to be developed** that can respond to these needs, and their readiness for **market deployment has to be shown**. **Specific materials for these technologies have to be developed**. Price competitiveness and environmental aspects have to be considered, as well as economic viability.

Scope: **Non battery-based storage technologies, such as Power to Gas, Power to chemicals and power to liquids (based e.g. on ethanol, methanol or ammoniac), or compressed air energy storage CAES, can be suitable solutions for different energy storage needs.**

These new technologies will **need new or considerably improved materials**, with increased performance and reduced total costs with respect to currently …

With respect to power to gas and power to fuels or chemicals, innovation will **result for instance** from the improvement of **electrolysers**. Advanced materials solutions may be high-capacity, durable proton exchange membranes and solid oxide electrolysis cell (SOEC) electrolysers for hydrogen production; or cost efficient materials for tanks for hydrogen storage.

Most technologies are still in an experimental phase and have to be prepared for **industrial deployment**. Price competitiveness and environmental aspects have to be analysed.

The materials should show its economic viability, also considering the cost related to the necessary overall infrastructure.

Special attention should be given to **sustainable materials**, the circular economy and eventual second life applications, and to materials that are easily available in Europe … . Recycling should be inherently possible on large scale, permitting overall costs that will not hamper market acceptance.

Materials for thermal storage and storage for hydropower are excluded from this call, as well as the development of fuel cells and supercapacitors.

LC-NMBP-30-2018		
Materials for future highly performant electrified vehicle batteries		

RIA	*Deadline model*	**2 stages**	*Budget*	**between EUR 6 and 8 million**
	23 Jan 2018	**28 Jun 2018**	*TRL*	**start at TRL 3 and achieve TRL 5**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☐

Biotech ☐ Nanotech ☐ Materials ☑ Pilot ☐ FoF ☐ EEB ☐ SPIRE ☐

LC-NMBP-30-2018	Materials for future highly performant electrified vehicle batteries

EMIRI Bridging the Innovation Gap

LC-NMBP-30-2018	**Materials for future highly performant electrified vehicle batteries**

Specific Challenge: Batteries are still a hampering factor for a clear market acceptance of Electric Vehicles as they are still not able to deliver the required performance considering driving range, **fast charging capacity** and safety for a **reasonable price**. This is mainly due to the limitations of the current Li-ion cell technologies especially in terms of safety – due to the use of liquid, flammable electrolytes – and energy density, which approaches their fundamental limits. New solutions have to be developed that will resolve the above mentioned cost and performance constraints ….. will strengthen the whole battery cell related value chain and will help to re-establish European competitiveness also in battery cell production.

Scope: New or significantly improved materials and/or chemistries have to be developed to optimise the battery cell and its components, with …. could be based, for example, on high voltage, Nickel- or Lithium-rich cathode materials; Lithium-Silicon, Lithium-Sulphur, Lithium-metal, or metal-air systems; new polymer or ceramic electrolytes, or any other technology that would be able to generate the required impact (including the so called "advanced Lithium-ion" and "post-Lithium-ion" technologies).

Proposals should in particular investigate phenomena and problems at the interfaces of the components of the battery cell electrode systems that … **solve the safety issues** encountered by the current Li-ion chemistries, … Knowledge on the **ageing processes** ….. for eventual **second life use** should be as well gained.

Production aspects should be considered during the prototyping phase. **Simulation and modelling** for the development phase as well as life cycle assessment, and specially-tailored test procedures for validating the new technology should be included. Scaling-up for production will not be covered under the topic.

Special attention should be given to sustainable materials, the circular economy and eventual second life applications, and as far as possible to materials that are easily available in Europe, in order to avoid market dependence, e.g. of critical raw materials. Recycling should be inherently possible on large scale, thus enabling overall costs that will not hamper market acceptance.

The following aspects should also be considered: prepare for developments in European standardisation and regulation; gain technological and market advantage of a new competitive European technology. Synergies with the stationary battery production sector could be explored.

LC-NMBP-32-2019		

Smart materials, systems and structures for energy harvesting

RIA	*Deadline model*	**2 stages**	*Budget*	**between EUR 5 and 7 million**
	22 Jan 2019	**03 Sep 2019**	*TRL*	**start at TRL 3 and achieve TRL 5**

Int. Coop ☐ ***Cross KET*** ☐ ***SME*** ☐

Biotech ☐ Nanotech ☐ Materials ☑ Pilot ☐ FoF ☐ EEB ☐ SPIRE ☐

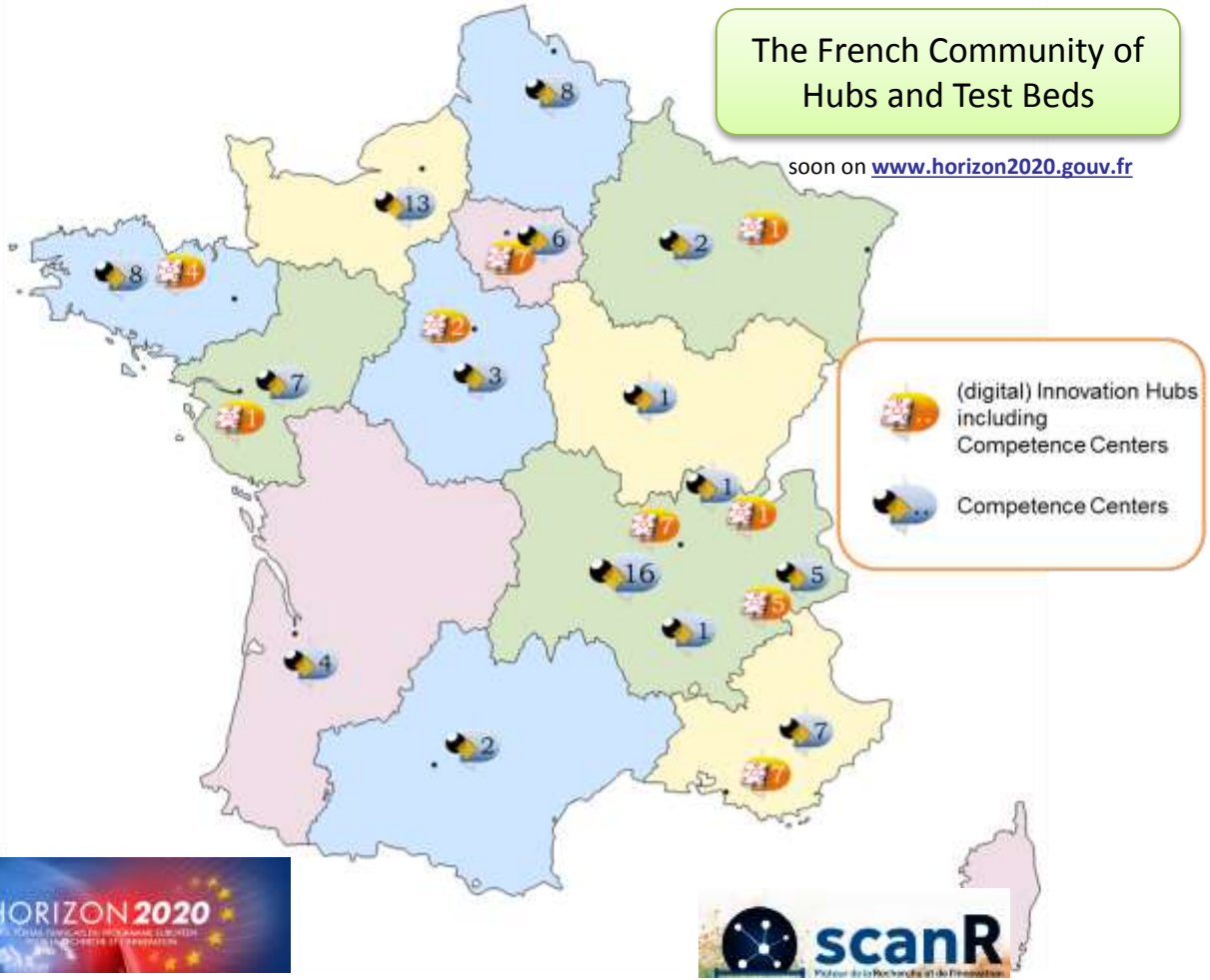
LC-NMBP-32-2019	Smart materials, systems and structures for energy harvesting

- Specific Challenge: The realisation of the European goals of increased energy efficiency, reduction in CO_2 emissions and the circular economy require novel ways of using, harvesting and storing energy. Smart materials and material systems/structures have already demonstrated the potential to reduce energy consumption as well as harvest, generate and store energy. However, implementation has been limited due to the materials' operational reliability as well as issues of recyclability and dependence on rare elements. In addition, cost concerns or lack of efficient manufacturing processes prohibit the wider implementation of such technologies. The next step is the implementation of these technologies in a wide range of commercial applications allowing the exploitation of the characteristics of smart materials. As the application of smart materials and developments in sensor technologies are dominated by SMEs in the EU, extending their innovation potential for smart materials applications is important for maintaining their market position and has a significant impact in improving EU competitiveness.
- Scope: Proposals should cover the following:
- The development of new materials and material combinations with energy harvesting and storage capabilities (e.g. lead-free piezoelectric based devices for energy generation and energy storing automotive structural components or magnetic materials systems);
- Clearly demonstrate reduction of around 25% in overall materials and processing costs relative to the state of the art and how the implementation of those technologies would be achieved;
- Demonstrate the recyclability and reliability of new smart materials, as well as a reduction in the dependence on rare elements;
- Integrate sensor technologies (e.g. MEMS based sensor concepts) and the potential linkage with the Internet of Things (IoT);
- Assess market perspectives and patents as well as standardisation;

For 2020

- They are only known by their title…
  - **LC-NMBP-28-2020: Advanced materials for innovative multilayers for durable photovoltaics (IA)**
  - **LC-NMBP-31-2020: Materials for off shore energy (IA)**
- They will be defined in the next months

Merci



http://www.horizon2020.gouv.fr

https://scanr.enseignementsup-recherche.gouv.fr/

SOME REMINDERS ON H2020

Reminders when preparing a proposal

BEFORE PROPOSAL STAGE — STEP 1

1. Clear Strategy for the proposal
2. How to read a call
3. What are the key drivers of the proposal

AT PROPOSAL STAGE

4. Innovation
5. Impact
6. TRL
7. Differentiation
8. Synergies

STEP 2

CONTEXT — During 1 & 2

9. Cross-cutting issues
10. Develop a knowledge base

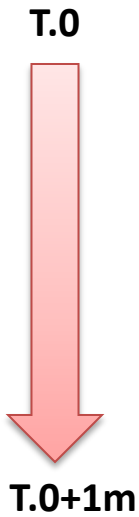
Rule n°1 – Define a clear strategy

STRATEGY

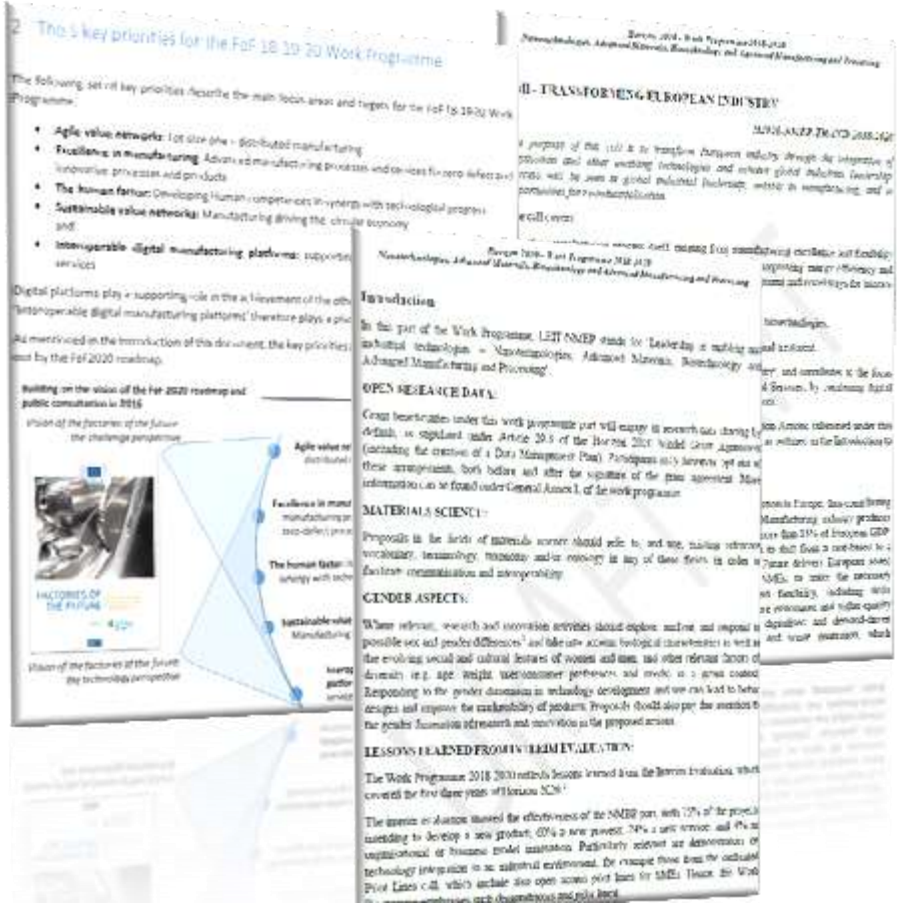
- Clear strategy for engagement: **consolidate the alignment of the strategy with the vision and roadmap of your organization**, and if needed with the regional or/and national priorities
- Define a strong partnership: **assess the expertise and the complementarity and contribution of the partners**. EU recognized expertise is not mandatory for all.
- A clear message is to be defined in order to get partners onboard and to leverage the **benefits for all the partners**
- Organise the **contribution of the Support Services**, the one which have the experience to elaborate EU projects
- Check which **national action is in place or necessary to support the proposal**

IMPLEMENTATION

- Step 0- A réception ou génération d'une idée de réponse au challenge
- Réception car venant d'un partenaire ou génération = idée spontanée d'un chercheur
- Recherche du topic qui accueille le mieux le sujet
- Recherche des partenaires proches
- 1ere Question: est-ce que le bénéfice pour ces partenaires proches est validé?
- Bénéfice pour le chercheur, bénéfice pour le end-user par exemple
- 2eme Question: qui sont les acteurs clés au niveau EU, sur la base du passé des dépôts
- Approche de ces acteurs - établissement d'un win/win basé sur la complémentarité des aspects scientifiques et industriels
- Go final sous 1 mois après Step 0
- Rédaction d'un *executive summary*, validation
- Check avec PCN et Project Officer en charge
- Définition du rôle pour chaque acteur
- Rédaction proposal



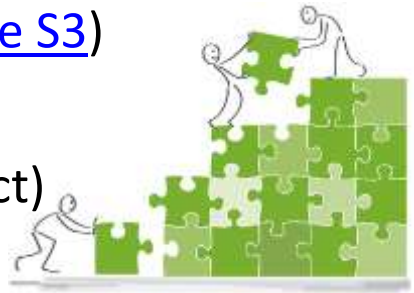
Rule n°2 – Read carefully the call



- AAP = partie émergée de l'iceberg
- Références croisées (autres WP, politiques UE, SRA, Roadmaps)
- Prise de recul nécessaire: contexte AAP,
- Exemple d'AAP : ***DT-FOF-02-2018: Effective Industrial Human-Robot Collaboration (RIA)***
  - DT = Digital transformation : définition, stratégie
  - FOF = Quels enjeux, impacts, acteurs, état de l'art, projets financés et en cours
  - RIA = TRL (4 to 6), budget par proposition (6-8M€)
  - Penser aux réunions de clustering de projets

Rule n°3 – Key drivers

- Think performance, impact & results!
- BIG PICTURE:
  - Your project: puzzle piece to the big question at EU level
- MEDIUM PICTURE:
  - Identify WP general contribution to major EU challenges
  - Identify related domains (link with other WPs, Focus Area)
  - Identify national/regional/local challenges (e.g: Aquitaine S3)
- SMALL PICTURE:
  - Project expected impacts (see Rule n°4 – Highlight Impact)



Rule n°4 – Highlight Innovation

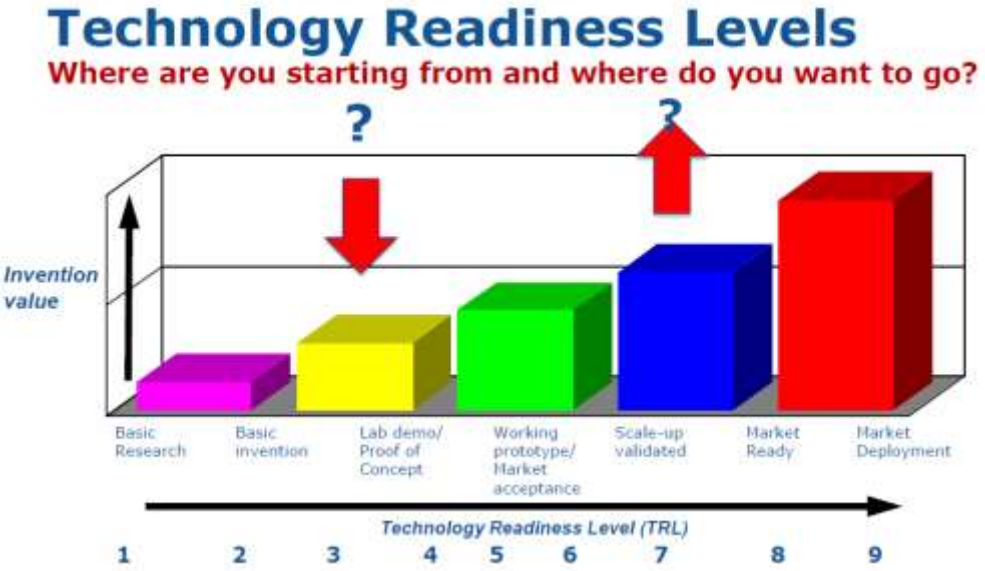
- Innovation = Excellence + Impact **(x1,5 IA)** + Implementation
  - Excellence part = **Innovation potential**
    - How much benefit?
  - Impact part = **innovation capacity**
    - Can the invention/new creation/design be used to develop other innovations?
  - Implementation part = **innovation management**
    - Innovation management = management of all activities related to understanding needs (identifying new ideas, develop new products and services which satisfy these needs).

LAROUSSE : Ensemble du processus qui se déroule depuis la naissance d'une idée jusqu'à sa matérialisation (lancement d'un produit), en passant par l'étude du marché, le développement du prototype et les premières étapes de la production

Rule n°5 – Highlight impact

- Minimum requirements: **Expected impacts mentioned in the WP/topic**
- **Substantial Impacts not mentioned in the WP** : Enhance innovation capacity, create market opportunities, strengthen competitiveness, address issues related to climate change (Focus Area…)
- Measures to maximise impacts:
  - Plan for dissemination & exploitation of results: **describe area in which you will make impact** & **who are the potential user of your results**
  - Business plan: represents the objectives of the business and plan to reach these objectives
    - Must be in line with the consortium strategy
    - Dedicate an innovation manager (or specialized partner) to take care of this specific issues
    - Think about an integrated business plan = taking care of each partner's IP strategy

Rule n°6 – Clearly demonstrate the progress in the TRL scale



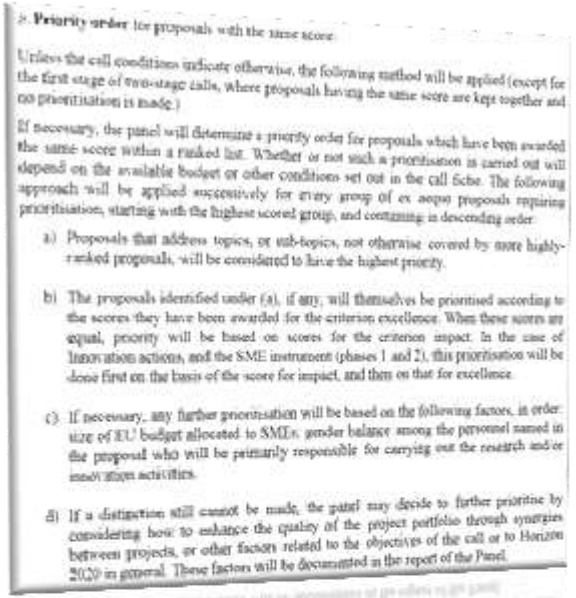
Technology Readiness Levels (TRLs) are introduced in H2020 in order to emphasise the innovation dimension

- ✓ Demonstrate in the proposal that the concept of TRLs has been well understood
- × Avoid activities falling outside to indicated TRL range for the topic (unless minor and well justified)

Show that the work of partners in the consortium is relevant to cover the TRL progress during the project and/or beyond. E.g: Brick techno apportée par un labo = via Task d'un WP = résultat (qui apporte qui reçoit)

Rule n°7 –Differentiation

- Potentiel d'innovation:
  - Innovation incrémentale
  - Innovation de rupture (licornes)
- Etat de l'art (ex. carto. brevets)
- Positionnement sur le marché
- Size of EU contribution for SMEs
- Gender balance (responsibility)



3. **Priority order** for proposals with the same score

Unless the call conditions indicate otherwise, the following method will be applied (except for the first stage of two-stage calls, where proposals having the same score are kept together and no prioritisation is made.)

If necessary, the panel will determine a priority order for proposals which have been awarded the same score within a ranked list. Whether or not such a prioritisation is carried out will depend on the available budget or other conditions set out in the call fiche. The following approach will be applied successively for every group of ex aequo proposals requiring prioritisation, starting with the highest scored group, and continuing in descending order:

a) Proposals that address topics, or sub-topics, not otherwise covered by more highly-ranked proposals, will be considered to have the highest priority.

b) The proposals identified under (a), if any, will themselves be prioritised according to the scores they have been awarded for the criterion excellence. When these scores are equal, priority will be based on scores for the criterion impact. In the case of Innovation actions, and the SME instrument (phases 1 and 2), this prioritisation will be done first on the basis of the score for impact, and then on that for excellence.

c) If necessary, any further prioritisation will be based on the following factors, in order: size of EU budget allocated to SMEs; gender balance among the personnel named in the proposal who will be primarily responsible for carrying out the research and/or innovation activities.

d) If a distinction still cannot be made, the panel may decide to further prioritise by considering how to enhance the quality of the project portfolio through synergies between projects, or other factors related to the objectives of the call or to Horizon 2020 in general. These factors will be documented in the report of the Panel.

Rule n°8 – Show synergies

- Strong consortium is key
  - Strong partners capable of providing relevant contributions. Trust / long-term collaborations is a must (existing local, regional or national projects…)
  - Links with local/regional ecosystems: show complementarity between projects and regional/local ecosystems

Rule n°9 – Cross-cutting issues

- Social sciences and humanities research is fully integrated into each of the pillars of Horizon 2020 and each of the specific objectives (see reminder n°7 – Differentiation)
- Gender equality and the gender dimension in research and innovation content

Rule n°10 – Develop a knowledge base

- Think about project follow-up:
  - Allow better sharing of project results
  - Reuse of data after the end of the project
  - Produce a stable and reliable database for the future
  - Integration of data into a market place (see call **DT-NMBP-20-2018** in latest version)
  - Take the B-to-B dimension into account

WP NMBP 2018/2020
Draft FAQ on Open Innovation Test Beds
September 2017

What are the Open Innovation Test Beds for material upscaling, characterisation, modelling, and safety?

- **Entities**, established in at least three Member States and Associated Countries, **offering access to physical facilities, capabilities and ser**vices required for the development, testing and upscaling of nanotechnology and advanced materials in industrial environments.
- Bring nanotechnology and advanced materials within the reach of companies and users in order to **advance from validation in a laboratory (TRL 4) to prototypes in industrial environments (TRL 7)**.
- **Upgrade existing or support new public and private test beds, pilot lines, and demonstrators** to develop, test and upscale nanotechnologies and advanced materials for new innovative products and services in some specific domains.
- Typically run by for profit organisations and/or RTOs.
- Users could be industry, SMEs as well as innovators.

How many Open Innovation Test Beds will be funded and in which domains?

- The call is expected to create about 20 Open Innovation Test Beds for **materials development and upscaling in six technology domains**:
  - Lightweight nano-enabled multifunctional materials and components
  - Safety Testing of Medical Technologies for Health
  - Nano-enabled surfaces and membranes
  - Bio-based nano-materials and solutions
  - Functional materials for building envelopes
  - Nano-pharmaceuticals production

- Four Open Innovation Test Beds for **materials characterisation** and four Open Innovation Test Beds for **modelling** will be also funded, in addition to the already existing NanoSafety Platform.

- These are expected to **create a European ecosystem**

Which activities of Open Innovation Test Beds will be eligible for funding? (1/2)

- All activities from the prototyping to the industrial production, and especially the **testing** in industrial environment, the **validation** of the characteristics of the materials and the control of the respect of **legal and regulatory** constraints.

- The EU funding will support the upscaling and engineering process, a number of demonstration cases and dissemination/links with other eco-systems.

- The largest part of the funding will cover equipment and service costs such as validation, experimentation and safety assessment.

Which activities of Open Innovation Test Beds will be eligible for funding? (2/2)

- Eligible costs could notably include:
  - Acquisition, adaptation, installation and calibration of upscaling and testing equipment
  - Demonstration cases
  - Definition of access conditions to facilities and services
  - Networking activities between Open Innovation Test Beds and similar initiatives
  - Visibility and dissemination activities
  - Services:
    - Technology expertise
    - Legal / regulatory expertise
    - Modelling tasks
    - Characterisation tasks
    - Facilitation of access to funding for test beds' customers

Which costs are not eligible?

- Building costs (related to edifices)
- Research costs, including acquisition of equipment, if not used for upscaling materials as described in the Open Innovation Test Beds topics
- Costs already repaid by a national, regional or European subsidy

What is the European added value of Open Innovation Test Beds? (1/2)

- **Collaborative projects**, as they will require participants from at least 3 Member States and to be accessible to any interested party from the EU or Associated Countries.

- Stimulate collaboration by pooling resources and existing knowledge at the EU level while supporting all kind of users independently from their geographical location, and they thus contribute to the creation of a more open and connected **European innovation ecosystem**.

- Set up networks amongst them, to offer additional services, to allow experiments and knowledge to be shared, and to provide users with a **single entry point** to their capabilities and services in materials development.

- **European networks of competences along the entire value chain**, and match the needs of industry by providing users with easy access to facilities, at different locations as needed. These networks should reach out to users across different regions of Europe. This is especially important to European regions that are building or improving their capacities.

What is the European added value of Open Innovation Test Beds? (2/2)

- **Single entry point** for any users to materials facilities and services across Europe
- Larger access to materials development facilities and services across Europe
- Accelerated maturity of products for a faster market entry
- Reduced costs for accelerating materials production for both industry and users
- Harmonised conditions for testing and procedures for materials upscaling, characterisation and modelling to improve internal market accessibility
- Increased return on investment in materials research
- Early stage access to intelligence on EU regulations making the materials development process more efficient
- Easier marketability of products in Europe (e.g. non-European products to be tested in accordance to EU regulations to enter the market)

How will Open Innovation Test Beds become sustainable once EU funding ends?

- Proposals should demonstrate that the test beds will reach out and deliver services to users, including SMEs, in a sustainable way and based on **market analysis**, a **business plan** and how to **attract** private investors.

- Being an Innovation Action the consortium will have to provide their own resources from the beginning, they should pay attention to adjust their services to reach a sufficient number of potential users.

- Proposals should include an exploitation strategy, together with dissemination actions, to ensure that potential customers will know about test beds existence, services, and access conditions.

- After the end of EU funding, the Test Beds will have to operate autonomously on the revenues of the services they provide.

Who are the potential applicants?

- Proposals can be submitted by a consortium, which is free to involve any relevant partner from Members States, provided that it respects Horizon 2020 rules and the conditions specified in the Work Programme.

- This means that private entities can apply, as well as Research and Technology Organisations, Research Centres, or Higher Education Establishments.

- While current pilot lines can apply, test beds' funding is not restricted to them.

What does open access mean?

- Open access in this context means that any interested party, from Europe and globally, can access test beds' facilities and services independently whether they are part of the consortium or not. However, this access is not for free.

- It is critical that any interested party from the EU or Associated Countries can access the test beds at fair conditions and pricing and with transparent and mutual obligations in regard to for instance on security, safety and intellectual property rights.

- Open Innovation Test Beds should set a framework for the definition of the access conditions to their facilities and services. Transparency and fair access are strongly recommended.

What will "single entry point" mean for the users?

- As test beds aim at providing a full service along all steps of the technological development of a physical innovation, all needed expertise have to be provided to users through a single entry point..

- If necessary, each test bed have to acquire complementary services from other entities, for instance on characterisation and or modelling, in order to offer a full package to users.

Will SMEs outside the project consortium have access to these test beds?

- Yes, SMEs will access the test beds at the same conditions than any other entity from the EU or Associated Countries.

- Being SMEs the core user group, test beds will offer a range of services which are of specific interest to them, e.g. regulatory support and development of innovative materials SMEs frequently cannot afford on their own.

- Proposals should demonstrate a solid and measurable outreach strategy towards SMEs and innovators outside the consortium.

How do the test beds interact with other test beds funded under the same topic and with other similar initiatives?

- Part of the EU funding for launching cooperation among themselves and with the other existing ones, with an aim to make this **cooperation systematic and sustainable** at the end of the project. Moreover, it will be in the test beds' interest to cooperate in a regular way with others entities to exchange services, as well as the outcomes of their experience in providing services.

- Each proposal should include an amount for coordination and networking, with other similar test beds as well as with other innovation eco-systems in the EU, whether European, national or regional.

- Moreover, a 2017 NMBP call Coordination and Support Action (CSA) project EPPN has stated to map existing services on upscaling of materials across the EU and Associated Countries. This mapping exercise is involving Member States, Candidate Countries and Associated Countries, for instance though the support of the High Level Group on Nanotechnologies and Advanced Materials (HLG).

Will the interaction between test beds be an evaluation criteria?

- The proposers will have to detail the way they plan their cooperation with other existing or in building test beds, therefore this element will be part of the overall evaluation.
  - It is considered an element of the sustainability analysis.

What is the link / synergy with regional funding?

- Open Innovation Test Beds should become an element of an overall eco-system on materials upscaling, which contains already some regional hubs, and therefore should cooperate together. The **sustainability analysis** and the business study which are part of the proposals allow to ensure avoiding duplication with existing hubs.

- *If a region supported financially a hub through the EU programmes, this hub cannot apply for an EU funding from Horizon 2020, as regional programmes are not allowed to top it up. However, if a Member State or a region wishes to support some entities in its costs for acceding the Open Innovation Test Beds, this is possible within the remit of the EU and national rules on State aids*

What is the link/difference with the Digital Innovation Hubs (DIH)?

- Digital Innovation Hubs focus primarily on **helping SMEs** to master their digital transformation and advice on the choice among technologies for digitisation.

- Open Innovation Test Beds are **complementary** to Digital Innovation Hubs as they concentrate on the upscaling, demonstration, characterisation and modelling of advanced materials, including nanomaterials.

- There could be in some cases the need to acquire digital services on a specific technology development. Synergies based on complementarities are possible.

Why we are not using cascading grants for test beds?

- Digital Innovation Hubs operate with cascading grants but their scope is larger than the Open Innovation Test Beds. The cascading grant system ensures to the Digital Innovation Hubs a stable range of users. Digital Innovation Hubs are technology neutral and provide their users with a neutral opinion on which technology to use. Moreover, cascading grants have to be managed by an entity having a large financial capacity to bear the subsequent financial risk.

- Open Innovation Test Beds work on a different scope and more downward segment of the value chain, where users of Test Beds will find an immediate benefit, **without needing a system of cascading grants**.

- It is expected, as it is currently the case for the existing Pilot Lines, to have *mainly private entities* managing the Open Innovation Test Beds.

How does the INNO SUP actions relate to the Open Innovation Test Beds?

- The INNO-SUP topics (under Horizon 2020) will fund mainly brokerage actions, matchmaking initiatives between innovative SMEs and large entities, but it doesn't fund the development process of the innovation in materials.
- The new INNO-SUP from 2017 calls foresees a similar approach than DIH, however focusing on manufacturing technics, therefore a different scope than the Open Innovation Test Beds.

- Nevertheless, Open Innovation Test Beds, DIH, INNO SUP funded entities, have links and need to ensure coordination as well as cooperation in some domains, as well as a coordination with national and regional structures.

What is the link with the Knowledge and Innovation Communities (KICs)?

- KICs are partnerships that bring together business, research centres and universities to develop innovative products and services, start new companies and train the next generation of entrepreneurs.
  - Start-ups set up following a KIC partnership can well use then the Open Innovation Test Beds to upscale their innovation in materials towards reaching the market.

Is there a link between the Horizon 2020 programme on research infrastructures and the Open Innovation Test Beds?

- The Horizon 2020 Research infrastructures programme deals with research facilities and funds especially the preparatory phase of new and the implementation of priority ESFRI infrastructures. It also aims at integrating national research facilities in the ESFRI network and these facilities will be serving for incubators too.

- The Open Innovation Test Beds focus on testing and upscaling equipment as well as modelling, characterisation, regulatory and technology advice for innovative technology products which have already gone through the research process and are at the further step of upscaling. In some specific cases, an Open Innovation Test Beds may acquire a service from an ESFRI for a specific product, however the ESFRI cannot be seen as Open Innovation Test Beds.