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# Horizon 2020 Work Programme for Research & Innovation 2018-2020

**Infoday**  
Madrid 19 October 2017

**NMBP Programme**  
**OPEN INNOVATION TEST BEDS –**  
**Calls 2018/2019**

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Research and  
Innovation



# Nanotechnologies and Advanced Materials

- **Industry successive markets**

## NANOMATERIALS

**Nanoscale Structures in unprocessed form**

Nanoparticles, Nanotubes, Nanoporous materials, etc

## NANOINTERMEDIATES

**Intermediate products with nanoscale features**

Nanocomposites, nanocoatings, etc

## NANO-enabled Products

**Finished goods incorporating nanotechnology**

Specific Sectors: Energy, Construction, Health, etc  
Crosscutting Technologies: Lightweight, membranes, etc

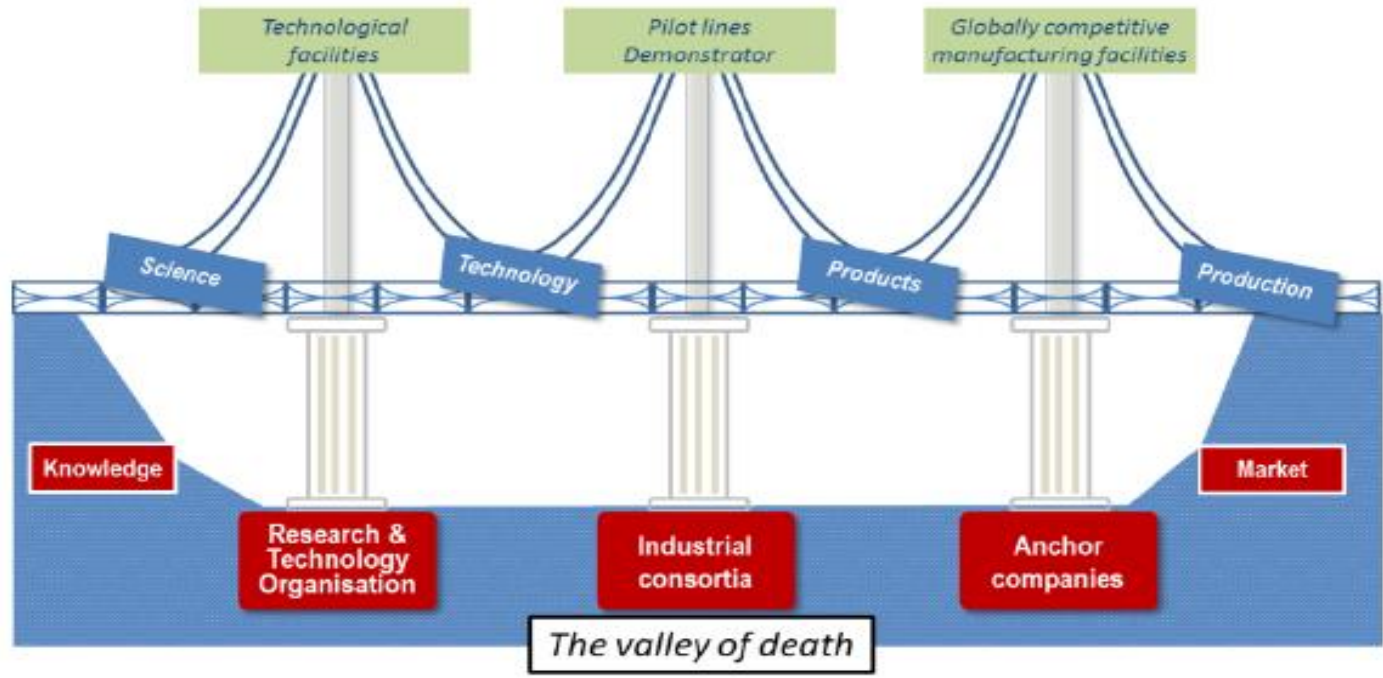
- **Example:**

Nanoparticles

Nanocoatings  
Thin-films (Self-Cleaning, anti-scratch...)

Glass Producer,  
Windscreens producer  
Car manufacturer

# Crossing the valley of death



TRL

1	2	3	4	5	6	7	8	9
Basic Principles Observed	Technology Concept Formulated	Experimental Proof of Concept	Technology Validation In lab	Tech valid. In relevant environment	Demonstration In relevant environment	Demonstration In operational environment	System complete and qualified	Successful mission operations

Technological Research  
Pillar 1

KET Pilot Line  
and demonstrator projects  
Pillar 2

Manufacturing &  
KET Deployment Project  
Pillar 3

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

## MARKET

Energy, Construction, Health...  
(Industrial Sectors)

Lightweight materials, Surfaces  
and Membranes, Bio-Based...  
(Cross-Cutting Technologies)

## ENGINEERING & UPSCALING (TRL 4 to 7)

Pilots

Characterisation

Modelling

Checking conformity with  
regulatory frame and  
standards

## Nanotechnology and Advanced Materials

# WP2018-2020 TEST BEDS

For upscaling nanotechnology and materials, Open Innovation Test Beds will be funded in 6 technology domains, plus **Characterisation and Modelling**

- DT-NMBP-01-2018 Lightweight
- DT-NMBP-02-2018 Med-tech Health
- DT-NMBP-07-2018 Characterization

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

**2018**



**2020**



**2019**

- DT-NMBP-03-2019 Surfaces and Membranes

- EMMC - European Materials Modelling Council
- EPPN - European Pilot Production Network
- Nanosafety Cluster

## Open Innovation Test Beds - Scope

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

# Example of Test Bed with Own Facilities and Services

## SOLUTION

**Open Innovation Test Bed on  
Lightweight nano-enabled multifunctional composite materials  
and components**

**Physical  
Facilities for  
piloting and  
testing**

**Characterisation**

**Modelling**

**Nanosafety**

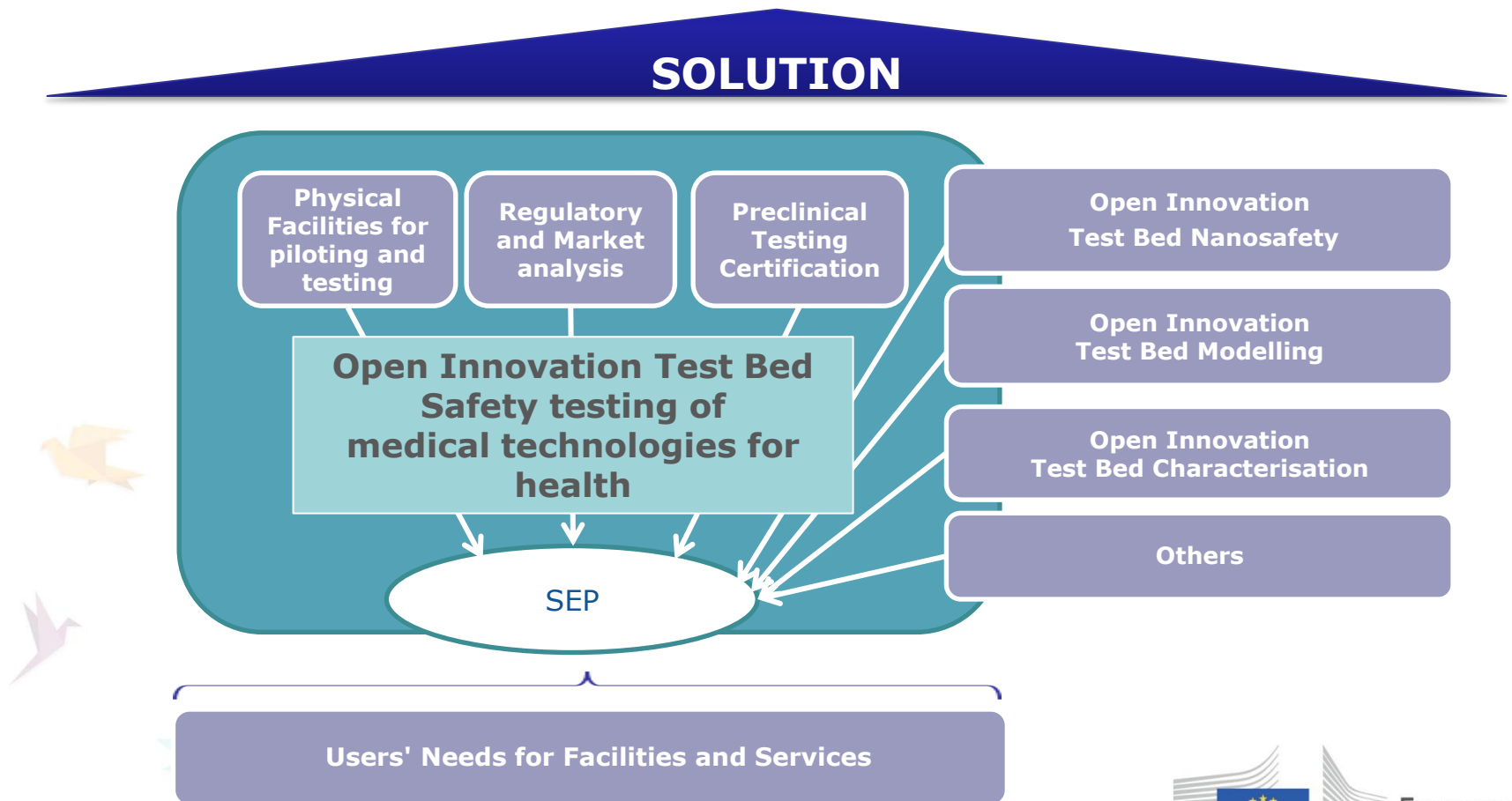
**Regulation &  
Standardisation**

**Business/  
Marketing  
Services**

**Users' Needs for Facilities and Services**



# Example of Test Bed with Facilities & Service in House and Provided by External Entities





## Open Innovation Test Beds – Expected Impact



**Open and upgraded facilities at the EU level**

**Reduced services access costs for companies using the TBs**

**Improved industrial productivity**



**Accelerated innovation in the specific domain**

**Increased access to finance (for SMEs in particular) for investing in these materials or in applications using them (reducing technological risk)**



**20% increase in SMEs access to TBs' services and increased access to finance for investing in these materials or in applications using them.**



# OPEN INNOVATION TEST BEDS (2018-2019)

- **DT-NMBP-01-2018:** Open Innovation Test Beds for Lightweight, nano-enabled multifunctional composite materials and components (IA)
- **DT-NMBP-02-2018:** Open Innovation Test Beds for Safety Testing of Medical Technologies for Health (IA)
- **DT-NMBP-07-2018:** Open Innovation Test Beds for Characterisation (IA)
- **DT-NMBP-03-2019:** Open Innovation Test Beds for nano-enabled surfaces and membranes (IA)

# DT-NMBP-01-2018: Open Innovation Test Beds for Lightweight, Nano-enabled Multifunctional Composite Materials and Components

## Specific Challenge

From TRL  
4 to 7!

- **Establish facilities** for cost effective and sustainable industrial upscaling and deployment of **new smart lightweight and nano-enabled 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

Up to 15 m€

IA  
70-100%

# DT-NMBP-01-2018: Open Innovation Test Beds for Lightweight, Nano-enabled Multifunctional Composite Materials and Components

## 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**

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

# DT-NMBP-01-2018: Open Innovation Test Beds for Lightweight, Nano-enabled Multifunctional Composite Materials and Components

*Open services - Value chain -  
SME access - Business plan*

## Expected impact

- Open, upgraded facilities, easily accessible to users across Europe.
- Attracting new SME users with >20% increase for existing test beds.
- Additional turnover of >4 times EU funding, within 5 years end of grant
- >15% improved process parameters.
- > 20% faster verification of materials performance.
- >20% improved industrial productivity, reliability, environmental performance, durability, and life-cycle costs of these materials.
- >15% reduction in energy consumption across sectors using the materials.
- Increased access to finance (for SMEs in particular) for investing in the materials or applications.

▶ **NOTE: Relevant indicators and metrics, with baseline values, to be provided!**

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

*TRL  
from 4/5 to 7*

Two new EU regulations that govern medical technologies (medical devices and in-vitro diagnostics) introduce a new set of rules to improve the safety of medical devices for the benefit of patients.

## The challenges are :

- To preserve timely access to innovative healthcare solutions and to support the competitiveness of the European industry,
- To provide testing facilities and support services to help industry and users develop and test medical devices that comply with the new safety regulations.
- To provide companies and users in this sector access to affordable and advanced testing facilities and services to facilitate the development of new and safe medical technologies
- To define new methodologies for clinical testing, when relevant.



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

*TRL  
from 4/5 to 7*

## Scope

- Verify compliance of design, development, preclinical and clinical testing of new/existing medical devices with new regulations.
- Accelerate and simplify pre-clinical and clinical testing paradigms.
- Identify regulatory, medico-economic and technical barriers.
- Open fair and transparent access as well as visibility and dissemination across the EU.
- Validate QC processes to permit on-line quality evaluation.
- Demonstrate medical devices in relevant environments.
- Propose services to maximise market uptake and awareness.
- Demonstrate wide application of services across Europe.





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

*Open services - SME access -  
Innovative materials – Impact!*

## Expected Impacts

- **Faster approval and thereby reduced time to market of new medical devices.**
- **Innovative, safe and cost effective, healthcare medical devices.**
- **Open and upgraded safety testing facilities for medical devices.**
- **20% increase in SMEs access to hubs' services.**
- **Substantial benefits for European citizens**
- **New market opportunities**

# DT-NMBP-07-2018: Open Innovation Test Beds for Characterisation

*TRL  
from 4 to 6*

## Specific Objective:

**Efficiency of materials up-scaling & use** in new products in European manufacturing industry depends on advances in characterisation and testing. Essential industry competencies comprise **technologies, know-how and proficiency in interpretation of results, data, and characterisation standards** in order to help bring new materials into products.

## Challenge:

**to establish open user-driven characterisation test beds** including all aspects of novel multi-scale & multi-modal characterisation solutions management, analytics and mining of the resulting data (Materials Informatics). Interaction is required between the stakeholders regarding the latest technological solutions, such as non-destructive characterisation approaches.

# DT-NMBP-07-2018: Open Innovation Test Beds for Characterisation

Establish open innovation characterisation test beds that will:

- create, sustain and drive the use of novel materials characterisation techniques, which will network materials characterisation stakeholders and implement an integrated approach. In particular:
  - Collectively develop **novel advanced solutions** for specific & relevant industrial problems.
  - Support advanced data analysis & storage, **standardisation, reference materials, regulation** & safety;
  - Facilitate **common approaches** to common problems for fast adoption of innovative tools for characterisation by industry and strengthen interface between academia and industry;
  - Enable the integration of information based on materials modelling & characterisation through the development of widely agreed & standardised datasheets
- Network relevant stakeholders across Europe for defining roadmaps, **application of real-time methods**, implementation of regulatory and safety requirements, training and management of information (Materials Informatics) & development of new skills.
- Proposals submitted under this topic should include actions designed to facilitate **cooperation with other projects**; to enhance user involvement; & to ensure the accessibility & reusability of data produced in the course of the project by agreeing on metadata for the description of materials characterisation and databases

*TRL  
from 4 to 6*

# DT-NMBP-07-2018: Open Innovation Test Beds for Characterisation

## Expected impact:

- Translation of industrial needs into characterisation workflows, increased awareness & uptake by industry, & effective access of materials manufacturing companies to know-how & advanced tools;
- **Measurable reduction of costs for product design & time-to-market** by means of faster & cheaper evaluation of production process deviations;
- Increased ability and quantifiable cost reduction for industry to comply with regulations.

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

*EUR ~ 9 million*

# DT-NMBP-03-2019: Open Innovation Test Beds for nano-enabled surfaces and membranes

## Specific Challenge

*From TRL  
4 to 7!*

**Establish facilities** for cost effective and sustainable industrial upscaling and deployment of nano-enabled surface and membrane technologies.

Integration of state-of-the-art nano-scale processes for modification, functionalisation, and structuring/coating of surfaces or membranes.

- e.g. using thin film architecture, coating tech., surface structuration etc., and/or
- nanostructured membrane's functionalities.
- for improved properties (e.g. optical, surface energy, durability, reduced friction, separation, filtration etc.)

**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

## 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 new nano-enabled surfaces and membranes.
- **Demonstrate** in relevant industrial environments.
- Applications can be industrial as well as consumer **products**.
- Potential **technical, economical and regulatory barriers** considered,
- Cover whole materials development chain: **single entry points**



Up to 15 m€

IA  
70-100%

# DT-NMBP-03-2019: Open Innovation Test Beds for nano-enabled surfaces and membranes

*Open services - Value chain -  
SME access - Business plan!*

## Expected impact:

- Open, upgraded facilities, easily accessible to users across Europe.
- Attract new SME users with >20% increase for existing test beds.
- Additional turnover of >4 times EU funding, within 5 years end of grant
- >15% improved process parameters.
- >20% faster verification of surface or membrane performances for highly promising applications.
- >20% improved industrial productivity, reliability, environmental performance, durability and life-cycle costs of the new surfaces or membranes.
- >15% reduction in energy consumption for applications using the novel nano-enabled surfaces or membranes.
- Increased access to finance (for SMEs in particular) for investing in the surface or membrane technology or in applications using them.

**NOTE: Relevant indicators and metrics, with baseline values, to be provided!**



# Thank you!

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[www.ec.europa.eu/research](http://www.ec.europa.eu/research)

Participant Portal [www](http://www)



# WP NMBP 2018/2020

## FAQ on Open Innovation Test Beds

Living document: updated as of 29 September 2017



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# 1- What are OITBs 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 services** 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 the setting of 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**.
- Users could be **industry**, including **SMEs**, as well as **innovators** and **start-ups**.



## 2- How many OITBs 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.



### 3- Which activities eligible for funding?

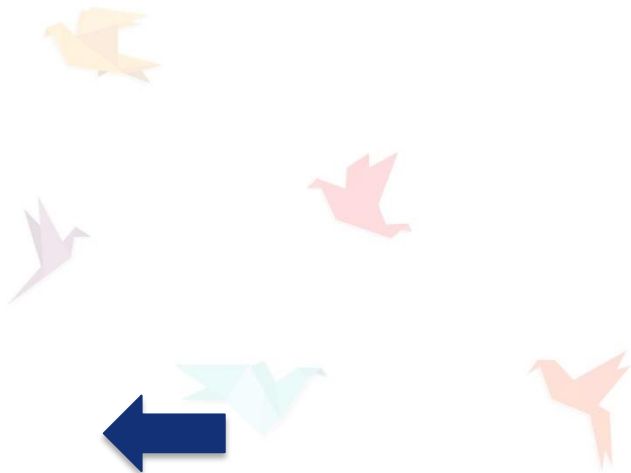
- All **activities from the prototyping to the industrial production**, and especially the testing in industrial environment, the validation of the characteristics of the materials and the control of the respect of legal and regulatory constraints.
- The **EU funding will support the upscaling and engineering process, a number of demonstration cases and dissemination/links with other eco-systems.**
- **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
  - Communication and dissemination activities
  - Services: Technology expertise; Legal / regulatory expertise; Modelling tasks; Characterisation tasks; Facilitation of access to funding for test beds' customers





## 4- Which costs are not eligible?

- Building costs
- 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



## 5- What is the European added value of OITBs?

- **Single entry point** for any users to materials facilities and services across Europe
- **Broad 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)



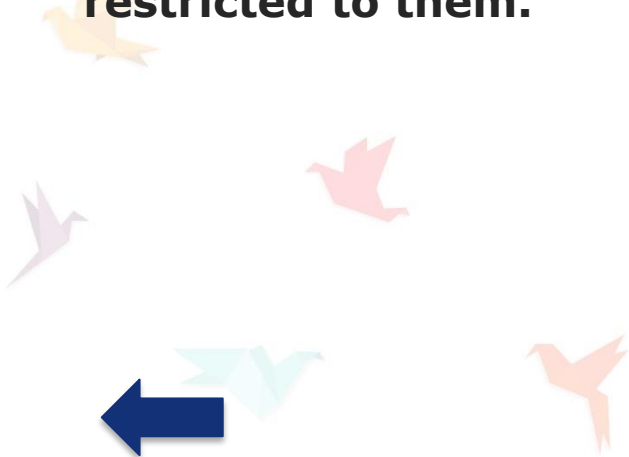
## 6- How will OITBs become sustainable once EU funding ends?

- 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 further investments, e.g. venture capital.**
- 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.**



## 7- Who are the potential applicants?

- Proposals can be submitted by a consortium, which is free to involve any relevant partner from **Members States and Associated Countries**, 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.**



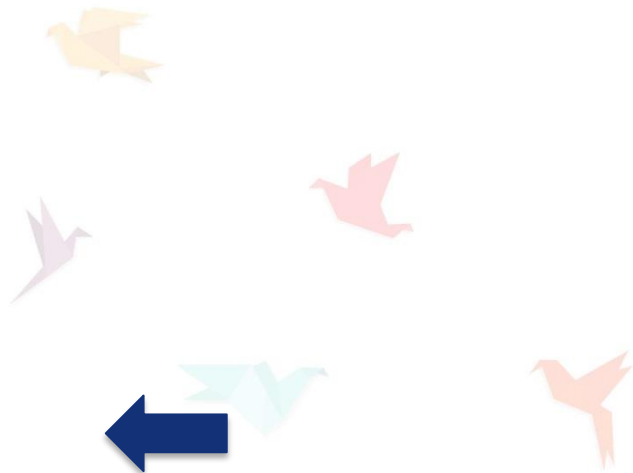
## 8- What does open access mean?

- 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.
- 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 respecting transparency and fair access conditions.**



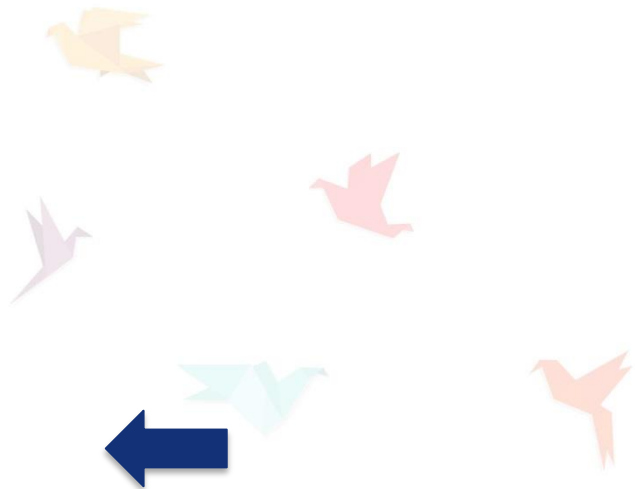
## 9- What will "single entry point" mean for the users?

- 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.



## 10- 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.
- For **SMEs as core targeted user group**, the 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.





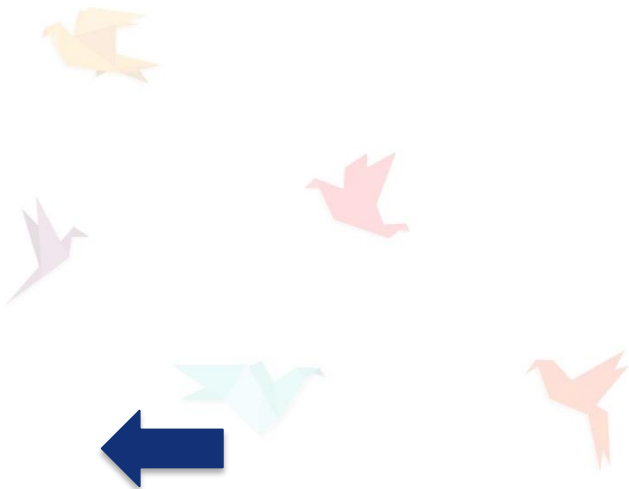
# 11- How do the test beds interact with other test beds funded under the same topic and with other similar initiatives?

- Part of the EU funding is for **launching cooperation** among themselves and with the other existing ones 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.
- 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, e.g. through the support of the High Level Group on Nanotechnologies and Advanced Materials (HLG).



## 12- 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 under establishment test beds, therefore this element will be part of the overall evaluation.
- It is considered an element of the sustainability analysis.



## 13- What is the link / synergy with regional funding?

- Open Innovation Test Beds should become an element of an overall ecosystem on materials upscaling, which already contains some regional facilities, and therefore **should cooperate together**. The sustainability analysis and the business study which are part of the proposals will ensure **there won't be duplication of facilities and activities at the regional level**.
- When funding facilities and services through Open Innovation Test Beds, **the principle of no double funding will apply** - <https://ec.europa.eu/research/regions/index.cfm?pg=synergies>
- If a Member State or a region wishes to support some entities in its costs for acceding to the Open Innovation Test Beds, this is possible within the remit of the EU and national rules on state aid.



## 14- 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.
- Open Innovation Test Beds could in some cases the need to acquire digital services on a specific technology development. **Synergies based on complementarities are possible.**



## 15- Why we are not using cascading grants for OITBs?

- 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.



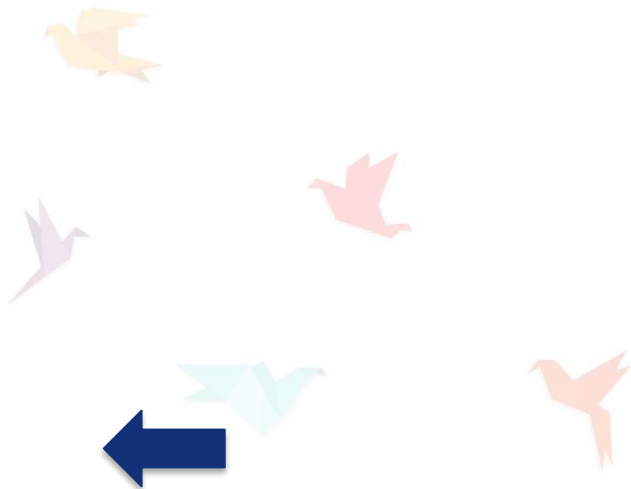
## 16- How does the INNO SUP actions relate to the OITBs?

- 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.



## 17- 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.



## 18- Is there a link between the Horizon 2020 programme on research infrastructures and the OITBs?

- 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 infrastructure for a specific product, however the ESFRI infrastructures cannot be seen as Open Innovation Test Beds.

