



# Open Innovation Test Beds for Advanced Materials

Examples and lessons learnt from one type of  
Technology Infrastructure



## Open Innovation Test Beds for Advanced Materials

European Commission

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# **Open Innovation Test Beds for Advanced Materials**

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# 1. INTRODUCTION

*This report describes how the Open Innovation Test Beds (OITBs) funded under Horizon 2020 and Horizon Europe contribute to the priorities of the Green Deal<sup>1</sup> and the New European Innovation Agenda<sup>2</sup>. It highlights the opportunities for the future and some of the challenges in the further development and sustainability of this instrument, based on the lessons learnt.*

*The OITBs are funded to support a future-proof industrial development in Europe, notably for advanced materials and nanotechnologies. OITBs are particularly relevant in the context of the ERA Policy Agenda Action 12<sup>3</sup> and the future discussion under the upcoming Coordinated Plan on Advanced Materials with Member States to support the Green Deal Industrial Plan<sup>4</sup>.*

*The OITBs bring together academia, research and technology organisations (RTOs) and companies, in a consortium with a single-entry point (SEP). SEPs should offer open access to testing and experimentation spaces, in particular for small and medium sized enterprises (SMEs)<sup>5</sup>. OITBs include both digital and physical facilities required to develop, test and upscale advanced materials, and in this way to move from validation in laboratories (TRL 4) to prototypes in industrial environments (TRL 7). The first generation of OITBs has delivered promising results during the implementation of the projects.*

*This report presents a first analysis of OITBs based on facts and figures extracted from the CORDIS Result pack on OITBs<sup>6</sup> of May 2022 and its update of June 2023; two webinars with the coordinators of the projects end of April and early May 2023; a questionnaire to the coordinators; past workshops and conferences; meetings with experts; several articles and analysis; the monitoring of the projects; and exchanges of insights between Project Advisers from HaDEA, coordinators from the projects and Policy Officers from DG R&I.*

*It aims to guide the ongoing and forthcoming OITB projects on the basis of eleven recommendations and to encourage Member States to consider the financial sustainability of the OITBs already in place. It also sketches out examples for future OITBs provided the current ones are successful.*

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<sup>1</sup> [A European Green Deal](#)

<sup>2</sup> [The New European Innovation Agenda](#)

<sup>3</sup> European Commission, Council recommendation on a Pact for Research and Innovation in Europe (13701/21), published on 19 November 2021, [Research and Innovation in Europe](#); European Research Area Policy Agenda overview of actions for the period 2022-2024 [European Research Area Policy Agenda](#)

<sup>4</sup> [The Green Deal Industrial Plan](#)

<sup>5</sup> [SME definition](#)

<sup>6</sup> [Open Innovation Test Beds to accelerate European innovation](#)

## 2. DEFINITION AND KEY FEATURES

Open Innovation Test Beds (OITBs) were launched within the Horizon 2020 Work Programme 2018-2020<sup>7</sup>.



The OITBs are defined as *physical facilities, established in at least three Member States and Associated Countries, offering technology access and services. The objective of the 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) and above.*

Under Horizon 2020, the following conditions were applied to OITBs to prepare a ground for their sustainable deployment:

- **Geographical outreach:** the physical facilities that are part of an OITB have to be located in at least three different Member States and Associated Countries.
- **Access through a Single-Entry Point (SEP):** Potential clients approach the OITB via a one-stop-shop and do not need to interact with the individual service providers. Every project has the obligation to set up or nominate an OITB single entry point (OITB-SEP), acting as a legal entity providing access to the OITB services and facilities. This legal entity should have the power to sign contracts on behalf of the OITB and be held accountable for it. The structure for such entity is up to the involved partners, but it must allow for partners to work together in order to provide access to services and facilities through a SEP and ensure sustainability. The timing for offsetting up an OITB-SEP is dependent on the project.
- **Access through a fair price:** The facilities and services are accessible to industry at fair costs and conditions.
- **Financial sustainability** is required after the end of the EU funding. Particular attention to the business development is needed; OITB consortia have to demonstrate an additional turnover of at least 4 times the requested EU funding, within 5 years of the end of the grant.

The OITBs are one form of Technology Infrastructures (TI)<sup>8</sup> essential for the European R&I and industrial ecosystems. TIs enable technology development between low and high TRLs, responding to the needs of industry (incl. SMEs and start-ups) as their main driver

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<sup>7</sup> For the specific section on Open Innovation Test Beds, see part 5.22 Nanotechnologies, advanced materials, biotechnology and advanced manufacturing and processing, Call – Foundations for Tomorrow's industry H2020-NMBP-TO-IND-2018-2020

<sup>8</sup> Technology infrastructures are facilities, equipment, capabilities and support services required to develop, test and upscale technology to advance from validation in a laboratory up to higher TRLs prior to competitive market entry. They can have public, semi-public or private status. Their users are mainly industrial players, including SMEs, which seek support to develop and integrate innovative technologies towards commercialisation of new products, processes and services, whilst ensuring feasibility and regulatory compliance. (Commission Staff Working Document, 2019)

and customers<sup>9</sup>. TIs in their different forms deliver technological and non-technological services by offering pilot lines, testing and experimentation facilities. They encompass digital innovation hubs, open innovation test beds, demonstration sites, living labs, etc. Therefore, OITBs<sup>10</sup> constitute a pertinent part of the broad TI landscape and are great examples of well-arranged collaboration of advanced research and technology infrastructures in specific industrial sectors.

According to a Staff Working Document on TIs<sup>11</sup>, they face four challenges: visibility, prioritisation, accessibility and networks.



Figure 1. Key features of OITBs

## 2.1 PROJECTS FUNDED UNDER HORIZON 2020

The first generation of OITBs projects kicked off in 2019 with a total of 10 projects funded in different fields. The second generation consisted of 4 projects starting in early 2020, followed by a third generation of 8 projects at the beginning of 2021. In addition to the third generation of OITBs, 3 projects on Open Innovation Platforms for materials modelling were launched, focusing on the modelling aspects of material development. An overview of thematic clusters of the H2020 OITBs is given in Table 1. The projects form a self-organised network aiming to create an integrated materials development ecosystem in Europe.

*Example: FormPlanet<sup>12</sup> is one of the first generation OITBs. It empowered SMEs from the sheet metal forming industry to accelerate their innovation in lightweighting with new high-strength sheet materials by giving them access to advanced metal characterisation services. This OITB have success cases in the automotive, home appliances and packaging sectors.*

<sup>9</sup> Viscido, S., Taucer, F., Grande, S. and Jenet, A., Towards the Implementation of an EU Strategy for Technology Infrastructures, European Commission, Publications Office of the European Union, Luxembourg, 2022, ISBN 978-92-76-46502-7, doi:10.2760/761184, JRC128007

<sup>10</sup> [CORDIS Results Pack on Open Innovation Test Beds](#)

<sup>11</sup> [SWD – Technology Infrastructures](#)

<sup>12</sup> [FormPlanet](#)

Table 1. Overview of H2020 OITB related projects<sup>13</sup>

FIELD	TOTAL GRANTED BUDGET	PROJECTS FUNDED
OITBs for lightweight, nano-enabled multifunctional composite materials and components (IA)	M€ 44.61	4
OITBs for safety testing of medical technologies for health (IA)	M€ 31.36	3
OITBs for Characterisation (IA)	M€ 22.92	3
OITBs for nano-enabled surfaces and membranes (IA)	M€ 58.64	4
OITBs for nano-enabled bio-based materials (IA)	M€ 55.64	4
OITBs for materials for building envelopes (IA)	M€ 44.67	3
OITBs for nano-pharmaceuticals production (IA)	M€ 11.10	1
Open Innovation Platform for materials modelling (RIA)	M€ 15.71	3

## 2.2 PROJECTS FUNDED UNDER HORIZON EUROPE

Horizon Europe opened the door to a fourth generation of OITBs. The Horizon Europe 2021-2022 Work Programme included one topic on Open Innovation Test Beds on climate neutral and circular innovative materials technologies. These projects are expected to provide services to industry for the design, development, testing, regulatory and environmental assessment and upscaling of climate neutral and circular innovative materials technologies. The relevant call closed in March 2022, and three projects were funded in January 2023 with a total budget of € 34.8 Million.

Table 2. Overview of HE WP 2021-22 OITB related projects

FIELD	TOTAL GRANTED BUDGET	PROJECTS FUNDED
OITBs on climate neutral and circular innovative materials technologies (IA)	M€ 34.80	3

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<sup>13</sup> Further explanation to the concept was provided by two documents “Explanatory Notes on open innovation test beds” and “Guidelines for internal management and access conditions”:

[OITBs-Explanatory Notes](#)

[OITBs-guidelines for Internal Management and Access Conditions](#)



A further topic for an OITB in a new field, to support the development of the hydrogen economy in the EU, has been included in the Horizon Europe Work Programme of 2023-24 with an estimated budget of €10 Million. The new OITB will contribute to the goals of the European Hydrogen Strategy<sup>14</sup>.

Based on past experience, there are new requirements for this new generation of OITBs:

- The OITBs need to be operational within the first six months of the start of the project.
- They need to provide an assessment of the circularity of the technology being tested, as well as to offer insight into potential domains for increasing its sustainability.
- They must have a solid and measurable outreach strategy towards SMEs and innovators outside the consortium.
- A credible business plan aiming at future sustainability and operation of the OITBs after the end of the grant must be developed.

### OITBs presence

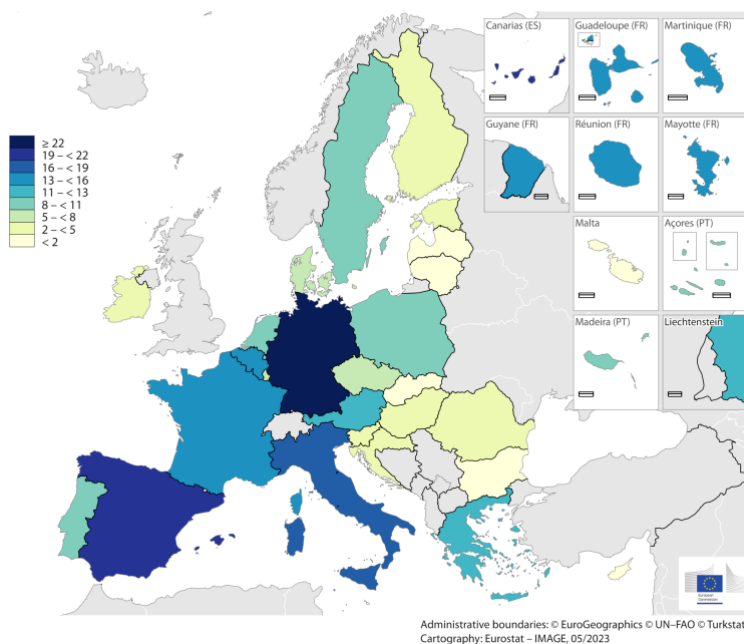


Figure 2. Distribution of OITBs partners in the EU

<sup>14</sup> [A hydrogen strategy for a climate-neutral Europe](#)

## OITBs coordinators

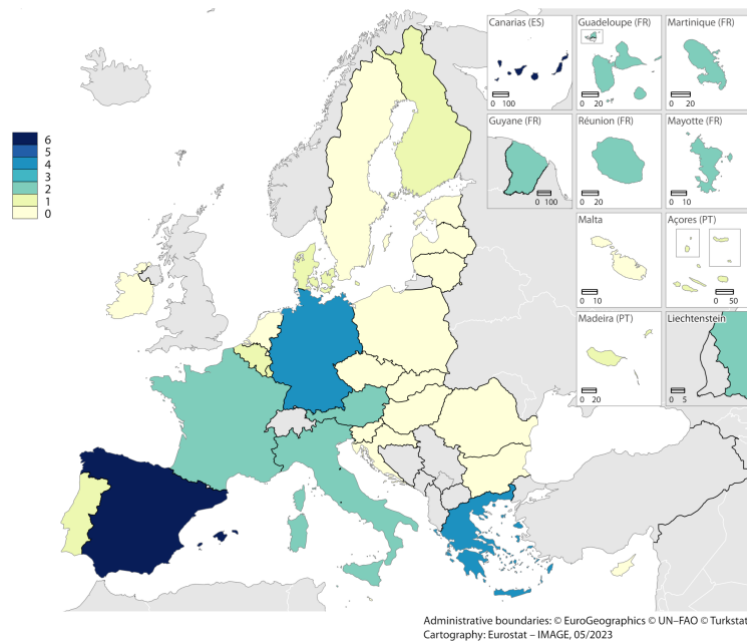


Figure 3. Distribution of OITBs coordinators in the EU

Figures 2 and 3 shows how OITBs partners and coordinator partners are distributed around the EU. On average OITBs have around 20 consortia members from 9 different Member States.

## 2.3 SERVICES AND SKILLS FOR SMES

### 2.3.1 Added value of the offered services

When developing new products, companies search for possibilities to test the technologies they consider innovative (e.g., through pilot lines); this requires support related to technical knowledge (training and interpretation of testing results); financing (venture capital, regional or European funds); and on how to address non-technological barriers such as regulation. The OITBs can address all these needs, from technology advice to business and financial coaching. The added value for the SMEs of the services offered by the OITB includes:

1. A comprehensive offer of services for the development of the SME's product bringing together many different providers across Europe under a common umbrella.
2. Clear rules and prices for the services offered by leading private and public research organisations across Europe.
3. Fast access to test bed facilities and high-quality services.
4. Technological and business support services including development of business plans, access to investors and leading companies, and early access to guidance on regulation for compliance with European norms.

5. Quick and efficient co-operation and licences with other businesses.

*Example: Through the LEE-BED<sup>15</sup> OITB, an industrial manufacturer was able to receive functioning prototypes for transparent panelling and interactive surfaces for their current crystal technology, based on novel transparent conductive materials and electronic production processes.*

SMEs are an important source of innovation, and new actions under the European Industrial Strategy<sup>16</sup> should strongly benefit SMEs and start-ups. They should be one of the main customers of OITBs, as they often lack the in-house capacities to carry out the high-TRL testing of their product, and therefore they benefit more from this instrument compared to large companies.

OITBs provide top-up resources with targeted skills that a small company might not have (personnel, knowledge, laboratories, support for business plan, regulation, standardisation, IPR, financing, etc.). It goes beyond the services provided by one individual provider (single pilot line or research infrastructure).

*Example: LightMe<sup>17</sup> OITB was designed to provide customers with everything they need to speed up the process to the market, including modelling and simulation services, testing and monitoring, as well as advice on regulatory compliance, nanosafety and business plan development. It functions as a bridge between upstream members of the value chain, such as material developers and research institutions, and the downstream end users and industrial manufacturers.*

The regulatory side of the development (and market deployment) of new products can prove a challenge for certain clients. Entrepreneurs, start-ups and SMEs are usually driven by technical experts/researchers specialised in a particular technology who might have limited understanding of all necessary regulatory aspects, especially when introducing new products requiring standardisation. The OITBs should be equipped to help SMEs to manage the compliance steps to reach the market in conformity with existing regulations and support in standardisation processes.

*Example: in the field of inhaled drug delivery, some MDOT<sup>18</sup> OITB partners are working to develop new devices specifically targeting preterm babies. This can enable a much more precise and efficient treatment for one of the most vulnerable patient groups, while at the same time reducing the waste of drugs and providing regulatory advice. Thanks to the success of the process, the MDOT team is considering creating a start-up company to commercialise the technology.*

**Recommendation 1:** OITBs should offer technology expertise, competences on business models, as well as regulatory and financial advice.

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<sup>15</sup> [Lee-Bed](#)

<sup>16</sup> [European industrial strategy](#)

<sup>17</sup> [LightMe](#)

<sup>18</sup> [MDOT](#)

### 2.3.2 Attracting SMEs as clients

A typical OITB project is allowed to use a part of its funding to run demonstration activities, optimising their internal operational and administrative procedures, collaboration and delivery of services, and hence preparing for a regular operation after the public funding ends. There are two ways to organise the demonstration activities:

- The first is to include partners in the project consortium with ideas or products that can benefit from the services provided by the OITB within the project.
- A second possibility is to organise Open Calls. These Open Calls will invite potential clients to approach the OITB with a concrete request for developing or characterising a new product, free of charge or at a reduced fee.

The first option represents a partner-driven approach, whereas the second has a wider outreach that is friendlier to SMEs.

Ideally, since the SMEs should be one of the main clients, the SEP (or the consortium if no SEP is yet established) would launch at least one Open Call during the project's lifetime, though there is no formal obligation for this (unless stated in the proposal and grant agreement).

From the first and second generation of OITBs, 13 out of 14 have launched or will launch Open Calls. The participation of SMEs in the calls ranged from 40 to 80%, with some project calls being restricted to SMEs. Until September 2022, more than 80 SMEs applied to these Open Calls with a success rate of more than 50%. One lesson learnt from the Open Calls is that the weakest point of SMEs applications was their exploitation and business strategy.

*Example: The NewSkin<sup>19</sup> OITB's outreach strategy is getting good results by directly identifying technologies and their benefits, looking for partners within the other OITBs or pro-actively searching for and contacting companies working in the field. The outreach is done with a sales minded approach. This OITB will launch four Open Calls. In the first call, they received 29 applications mostly from SMEs, but also large companies and research institutions. The second call triggered 25 applications again mostly from SMEs.*

**Recommendation 2:** OITBs should focus on SMEs and their needs as their main clients and target them accordingly via Open Calls.

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<sup>19</sup> [NewSkin](#)

## 3. BEST PRACTICES AND CHALLENGES

This section draws from experience from several mature projects funded since the kick-off of the first generation of OITBs in 2019. It showcases some good practices and identifies opportunities, from which other projects can learn. It also covers challenges that have been repeatedly identified during the implementation of the OITB projects, and provides further recommendations to overcome or avoid problematic situations.



### 3.1. SERVICES AND SKILLS FOR SMES

#### 3.1.1. Visibility to SMEs

The strong participation of SMEs as customers of the OITBs ensures the continuity of operation and services well beyond the end of the project. In this respect the OITBs' visibility is one of the most important aspects, one that has to be well incorporated in the overall concept of the project from its earliest stage.

Well targeted and structured dissemination work is needed to make SMEs aware of the advantages the OITBs offer. Besides social media promotion, conferences or scientific dissemination, a sales mentality and business-oriented marketing are key elements of success. Reaching out to clients, in particular SMEs, has direct benefits for the sustainability of an OITB after the EU funding of project ends. Attracting SMEs to an OITB is a long-term, step-by-step process including trust building, and it is crucial to foresee a preparatory phase of this outreach to SMEs.

The Open Calls launched by an OITB allow it to reach a wide audience, engage with relevant players in innovation ecosystems and promote opportunities for SMEs, and are the preferred way to attract interest (see also section 2.3.2). An OITB needs to actively look for reliable long-term clients and real-life user cases, since showcasing its added value is the first step in ensuring that SMEs will recognise the long-term benefits in engaging. A market analysis, interviews with potential clients, and examples of successful customer cases, can help in building up a well targeted outreach strategy.

Experience from ongoing projects shows that even Open Calls require an active outreach, as in many cases the OITBs receive a limited number of applications when they launch Open Calls. The concept of OITBs is still new to the stakeholder community. Even though more recent OITBs are expecting more applications to their Open Calls, it is important to continue to attract SMEs by creating synergies not only with the OITBs ecosystem, but with relevant organizations or networks willing to promote the OITBs, such as with the networks of National Contact Points (NCPs)<sup>20</sup>, or national certification bodies and the Enterprise Europe Network (ENN)<sup>21</sup>.

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<sup>20</sup> [NCP-guiding-principles](#)

<sup>21</sup> [Enterprise Europe Network](#)

Since SMEs vary across regions and sectors, it is important to define the relevant ones and to understand their hurdles. Contact with regional networks or the assistance of translators in MS, without the presence of the OITBs, could also help in the outreach, since there are fields, such as construction, in which SMEs are more locally based and need to be contacted in their own language.

*Example: In i-TRIBOMAT<sup>22</sup> OITB the main communication channel is the homepage of the SEP Digital Platform. It is an interactive service catalogue as well as a SEP for clients, enabling a seamless workflow from the service request through service execution to the billing. Their research partners are regularly developing and adding new services to the platform, which is available via a spin-off entity called i-TRIBOMAT: The European Tribology Centre. A joint venture of the various research partners, establishing this company ensures the sustainability and longevity of the platform. This OITB project acknowledges that there is a significant difference between communication/marketing and sales. They implement an effective sales strategy and the CEO of the company and the Service Coordinators have sales skills and expertise. This was proven during their Open Call for Early Adopters where 14 out of 18 potential customers were attracted via outreach by small but efficient marketing team.*

**Recommendation 3:** OITBs should improve their proximity to customers, with the assistance of the internal marketing departments of consortium members, a network of translators in Member States and Associated Countries where there is no presence, the Enterprise Europe Network (EEN), the M-ERA.NET network<sup>23</sup>, national certification bodies and national contact points (NCPs).

### 3.1.2. Common guidelines and quality label

Setting common criteria and harmonising administrative procedures amongst all OITBs will improve their functionality and sustainability. These include Open Calls and their evaluation procedure; model agreements for the SEP; templates between users and SEPs; modalities of access to services; rights and obligations; data protection, confidentiality, liability and insurance; etc. This will also clarify the role of the consortium members, increase transparency towards users, and reinforce the trust between different actors while ensuring smooth operations. This is the foundation for establishing an Open Innovation Ecosystem of OITBs.

Common procedures save time and effort and reduce the associated costs passed on to customers. Having a common set of rules amongst existing OITBs will also make the entry of new OITBs to the ecosystem more cost-efficient. To reinforce visibility of the OITB, a concept brand or corporate identity as an OITB is also valuable. In this respect, it would help if the current network of OITBs starts developing and adopting a label which should be awarded to those OITBs offering best practices.

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<sup>22</sup> [i-TRIBOMAT](#)

<sup>23</sup> [M-ERA.NET](#)

*Example: FlexFunction2Sustain<sup>24</sup>, Safe-N-Medtech<sup>25</sup> and, recently, Conver2Green<sup>26</sup> OITBs organise an annual workshop to exchange experiences amongst OITBs, and hence strengthening the ecosystem, identifying the best solutions for common challenges, and working jointly towards a fully integrated open innovation ecosystem providing services to the industry.*

Cluster association of OITBs could help in reaching more clients. The strategic collaboration as a cluster with (one or more) commercial companies for support to the exploitation of OITB assets (results, catalogue of offerings, brand) could lead to:

1. More collaboration/agreements to find synergies and complementarities with other OITBs.
2. Better dissemination of the OITBs work.
3. Dealing with the language barriers by providing access to all services from every region.
4. Better awareness and understanding of the OITBs by the SMEs.
5. Ensure that best practices and lessons learned are shared and knowledge is not lost.

**Recommendation 4:** The network of OITBs should cluster and jointly develop a label for OITBs together with the Enterprise Europe Network (EEN), national certification bodies and National Contact Points (NCPs).

### 3.1.3. Intellectual property rights and confidentiality

Intellectual Property Rights (IPR) must be granted in order to make innovation happen. Companies in general put a lot of effort in IPR and confidentiality protection for the creation of a safe, profitable and sustainable business, but companies often lack experience with IPR. Patents, data rights, know-how protection and branding (trademarks/domain names) will be therefore needed, for the long-term recognition of both the OITB and their customers, and should form an integral part of the service portfolio.

When starting an OITB, the IPR and confidentiality amongst partners and with regard to clients must be clearly and explicitly set out in the Consortium Agreement. The consortia need to think about the long-term licensing of the outcomes of the project, and funds should be clearly set aside for IP protection and exploitation.

One lesson learned through the Open Calls is that in parallel of developing the prototypes, IPR developing is crucial to reach the market.

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<sup>24</sup> [FlexFunction2Sustain](#)

<sup>25</sup> [Safe-n-Medtech](#)

<sup>26</sup> [Convert2Green](#)

**Recommendation 5:** The OITBs should promote internally, and to their customers at large, the Code of Practice on the management of intellectual assets for knowledge valorisation in the European Research Area<sup>27</sup>, for efficient IP licensing for market uptake and societal value creation. The OITBs should dedicate a part of their funding to IP protection and exploitation.

### 3.1.4. Standardisation and regulations

Given that 70% of all innovations are related to materials, standardisation of new testing processes and products is key for advanced materials and nanotechnologies. A good practice for the OITB ecosystem would be for one OITB in each field to have a direct link with a standardisation body.

*Example: UNE, the Spanish Association for Standardisation, is a member of the OASIS<sup>28</sup> OITB consortia.*

OITBs could also contribute to other thematic policy areas such as:

- The development of greener batteries in collaboration with the BATT4EU<sup>29</sup> partnership, aiming at accelerating the establishment of a globally competitive battery industry in Europe.

*Example: In the development of a competitive European battery industry, TEESMAT<sup>30</sup> OITB managed more than 700 samples and conducted 250 tests for more than 40 user cases to develop safer, longer-lasting, greener batteries for SMEs and large companies.*

- OITBs on Safety Testing of Medical Technologies for Health and OITBs for nano-pharmaceuticals production can offer support in developing new diagnosis and treatment products, helping to achieve the objectives of the Cancer mission<sup>31</sup>.

*Example: A significant milestone for SAFE-N-MEDTECH<sup>32</sup> OITB and for the whole nanomedicine community is the first human application of iron-oxide magnetic nanoparticles<sup>33</sup> to treat pancreatic cancer. The OITB supported a company in the development and characterization of a product, in finding a new indication (prostatic cancer) and in getting regulatory approval of a treatment to fight against a devastating disease with scarce treatment options.*

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<sup>27</sup> [Code of Practice on the management of intellectual assets for knowledge valorisation](#)

<sup>28</sup> [OASIS](#)

<sup>29</sup> [BATT4EU](#)

<sup>30</sup> [TEESMAT](#)

<sup>31</sup> [Cancer mission](#)

<sup>32</sup> [Safe-n-Medtech](#)

<sup>33</sup> [Oncology Applications - safenmt](#)



- Other policies related to sustainability in construction and design such as the New European Bauhaus<sup>34</sup>.

**Recommendation 6:** the OITBs should cooperate with technical committees to promote new standards or revise relevant existing ones.

**Recommendation 7:** The network of OITBs should inform their members about the most relevant developments in regulations and standards.

### 3.1.5. Financial and funding advice for SMEs

A free of charge access to, and use of, the OITBs might seem an attractive solution to engage SMEs, but such an approach it does not offer the necessary good-long term business model. Instead, OITBs are encouraged to offer to SMEs not only access to testing facilities, but offer at the same time access to banks, to venture capital and/or to public funding. Only such a combination will make them attractive for SMEs to engage in the long-term, since most of OITB customers need financing.

*Example: The value proposition of LightCoce<sup>35</sup> OITB SEP is based on four main elements: access to Pilot Lines and associated technology and competence (including IPs); access to network; access to finance; and access to international markets.*

The OITBs should offer to SMEs proactive access to such investors and support, especially from the region where the SME is located, including the possibility to raise additional funding. This can be done either in close collaboration and synergies with existing services per country, or by including such providers in the project consortium. They need to treat private and public investors as clients and give them all the information needed to make well informed decisions whilst decreasing the investment risks.

*Example: Example: NewSkin<sup>36</sup> OITB have supported applicants to get resources through investors or InnoSup<sup>37</sup> actions, in which they succeeded with PULSATE to fund Bionic Surfaces.*

**Recommendation 8:** The OITBs should include in their service portfolio investment advice for SMEs, for example to harness additional private or public funding, and to provide investment and market readiness evaluations for investors.

## 3.2. THE BUSINESS PERSPECTIVE

According to the conditions established in Horizon 2020 and Horizon Europe, the OITBs should be run as a business model. After the initial phase, where an OITB needs funding to start their activities, it should remain operational in the long term without public funding.

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<sup>34</sup> [New European Bauhaus: beautiful, sustainable, together](#)

<sup>35</sup> [Lightcoce](#)

<sup>36</sup> [NewSkin](#)

<sup>37</sup> [InnoSup](#)

*Example: Safe-N-Medtech<sup>38</sup> OITB has supported eight products in their pathway towards commercialisation, with the main objective of creating a sustainable organisation with a credible business plan, which can provide services to innovators considering the design and production of nano-enabled medical technology.*

The OITBs should be able to survive in a cost-based system as an independent provider and legal entity, by providing their services at market price and by offering financial advice and/or access to finance (private or public investments) to pay for their services. The OITB are appealing to both for small and big companies as long as there is a project backed up by EU funding. At the end of the project, the access of SMEs to the OITBs becomes more difficult, as most of them cannot afford the costs of the products and services of the OITBs. Larger companies may still afford these costs, but may not need them.

A solid and credible business plan for the OITB will help the shareholders to commit to the new company and create long-term engagement. It may happen that the new entity will not be sustainable in the starting phase and will need time to become operational. It is important for profitability to acquire, and engage with, new and regular customers. Members of the consortium need to be aware of this in advance.

Differences between industries, RTOs and Universities must also be addressed. An OITB should also pursue goals like the provision of services to industry and SMEs, and being a platform for innovation. It entails the creation of an ambitious and sustainable business, a wide spectrum of services, which in turn requires an extra commitment from the project partners also after the end of the project. Scientific publications and other dissemination activities should be negotiated with industry clients in advance.

Regarding the sustainability of an OITB, there are issues to address: from the viability of the OITB after the project ends, to the funding of the OITB during its transition from a project to a well-established self-sustaining business.

### **3.2.1. Single-Entry Point (SEP)**

A strong SEP is needed to achieve business leadership and to ensure the commitment of the members of the OITB. It is crucial that the partners define common rules and the relationship amongst them, considering the rights and duties they have.

Projects cannot overestimate the importance of finding an appropriate legal form for the SEP. This is an important milestone towards long term financial sustainability. Statutory constraints of universities and Research and Technology Organisations (RTOs) in participating as shareholders, due to their educational and research missions, should not be an obstacle. OITBs should face these negotiations from the beginning, and present clear plans at the proposal stage. A possible solution is to sign an external service contract, to establish bilateral association/collaboration agreements between the Universities/RTO's and the OITB, in which agreement the SEP is the private entity that is liable to provide the guarantees of the services/products and bearing the responsibility towards customers.

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<sup>38</sup> [Safe-n-Medtech](#)

*Example: in OASIS<sup>39</sup>, a project from the first generation of OITBs, one of the consortium members acted as SEP during the project allowing the OITB to be functional from the beginning. The consortium set up a collaboration agreement amongst their 12 members (ranging from Universities and RTOs to SMEs and large companies) from 6 different countries. After the public funding finished, the 12 partners signed another collaboration agreement to make the SEP operative. After a period of 12 months the sustainability of the SEP will be assessed, and a legal entity will be set up.*

From the 25 OITBs of H2020, 10 SEPs are or will be established as for-profit organisations, 8 as non-profit organisations, 1 is a collaboration agreement and 6 are still to be defined (by the end of 2022).

*Example: NextGenMicrofluidics<sup>40</sup>, a project from the third generation of OITBs, is a successful example of establishing the SEP in the 12<sup>th</sup> month after the funding of the OITB.*

The location of the SEP also has two important elements that need to be clarified: firstly, ensuring neutrality of the SEP towards the members of the consortium, and secondly agreeing on the languages covered by the OITB. The SEP must be transparent and as independent as possible, preferably with strong links to different regions and countries in Europe. Depending on the field, SMEs usually require a contact speaking their language, therefore, regional representatives of the SEPs or collaboration with regional actors should be part of the services.

A SEP can incur relatively high costs, for marketing and promotion, establishment of the company, salaries etc., which must be covered by revenues. Potential sources of revenues can be linked to sales commissions, specialised services, events and other community services, membership fees etc., as well as continued public funding through national, regional or combined funds, also across countries or regions.

The sustainability of an OITB relies on establishing a functional SEP that represents an excellent marketplace of competence. When the project ends, the members need to create a new collaboration agreement where the business model or strategy, main activities and management pillars are specified. This new entity needs to ensure transparency amongst all members and have an overall knowledge of the services of the OITB and commercial strengths: service delivery managers combining commercial and technical skills, and staff members actively seeking new potential customers and developing new services and sales strategies.

**Recommendation 9:** To be successful in the long-term, OITBs should put in place a single-entry point (SEP) during the first year after the start of the publicly funded project, including a financing strategy and a permanent location.

### 3.2.2. Value proposition of a SEP: a robust service catalogue

The OITB led by a SEP should develop a proposition with clear added value, targeted to both clients and their supporting members. Otherwise, clients may think that they can find similar products or services easily, and members may not commit to the consortium.

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<sup>39</sup> [OASIS](#)

<sup>40</sup> [NextGenMicrofluidics](#)

The value proposition for the clients should consist of a robust service catalogue (to be updated regularly) on existing testing facilities, but also showing how such facilities fit the needs of SMEs. The catalogue should offer relevant pricing models for innovative products and services, and sales forecasts, but also the communication and marketing plan, the HR services, training providers, suppliers, IT, associated costs, etc., if it is to have a realistic overview of operating expenses and fixed costs.

Understanding the customers' needs is crucial, along with their involvement in the process definition, use of appropriate interested services, planning etc., with an effective communication and regular feedback from service providers. The strength of a OITB resides in the combination and synergies of many services that are not directly available in the market. Hence, it is important to avoid offering services which can be found elsewhere, but build on feedback from market research to maximize the efficiency.

*Example: TBMED<sup>41</sup> OITB aims to reduce the time taken from idea to market in this sector through the creation of the platform named go.Med<sup>42</sup> which offers all the technical services required to go from proof of concept in the lab to clinical trials, including design and manufacturing optimisation, quality control, design of the scaling-up process, and monitoring of safety and efficacy in laboratory in vitro testing. The platform also provides support services such as regulatory strategy, health technology assessment (HTA), business advice and assistance in sourcing funding.*

SMEs might require technology support, business and financial coaching, and a clear vision of the possibilities of the technologies to develop their ideas. Orientation, training and education are key aspects. OITBs should focus on both innovation (Prototyping-Upscaling-Manufacturing) and investment support (services for financing). A solution could be to simplify and prioritise the services no other provider can offer, designing a package to help SMEs more efficiently to navigate through the OITB and matching client needs with what the OITB can provide with detailed implementations plans and information.

**Recommendation 10:** To be successful in the long-term, OITBs should identify the unique features and needs of their customers. This should cover the entire lifecycle (testing, pilots, pre-market introduction, etc.), to allow services to be prioritised accordingly.

### 3.2.3. Opportunities of funding for the OITBs

As previously explained, OITBs should act as commercial business operators and therefore secure revenues to stay operational. In the transition period between the end of the project and the time when the OITB is completely self-sufficient, public funding could help to guarantee the continuity of the OITB:

- The SEP as a legal entity can apply for European funds, or national or regional funding from the country or region where they are established.

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<sup>41</sup> [TBMED](#)

<sup>42</sup> [Services to Medical Device Developers](#)

- The SMEs can apply to the funding programmes dedicated to SMEs, and obtain for instance innovation vouchers or similar<sup>43</sup> to subcontract services from an OITB.

To sustain the market-driven nature of technology infrastructures, including OITBs, research infrastructures, testing and experimentation infrastructures and facilities are recognised in the revised State aid rules<sup>44</sup>. The new State aid rules create a flexible, fit-for-purpose framework, to allow Member States to provide the necessary support to reach the Green Deal<sup>45</sup> objectives in a targeted and cost-effective manner. The rules are aligned with the important EU objectives and targets set out in the European Green Deal, and with other recent regulatory goals.

The latest revision of the State aid rules is a strategic opportunity to allow directing state aid towards R&I-policy objectives and for supporting in particular, research, testing and experimentation infrastructure and thereby leverage additional private R&I-investment. The provisions of the RDI Framework are complemented by the General Block Exemption Regulation (GBER), which lays down ex ante compatibility conditions, on the basis of which Member States can implement State aid measures without prior notification to the Commission. Similarly, the recent changes and revisions were meant to align the conditions with the Green Deal and the Industrial and Digital Strategies.

These different opportunities require a good knowledge inside the OITB on different options to be able to explore opportunities via the SEP or guide individual partners or SMEs in their application procedures. Ensuring financial support, including public funding, for SMEs to use the OITBs contributes to the OITBs own sustainability.

**Recommendation 11:** Member States and regions should consider opportunities to support the financial sustainability of OITBs after the end of the EU funding, for instance under the exemptions foreseen under the revised State aid rules and the European Regional Development Fund.

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<sup>43</sup> [innowwide](#)

<sup>44</sup> [Framework for State aid for research and development and innovation](#)

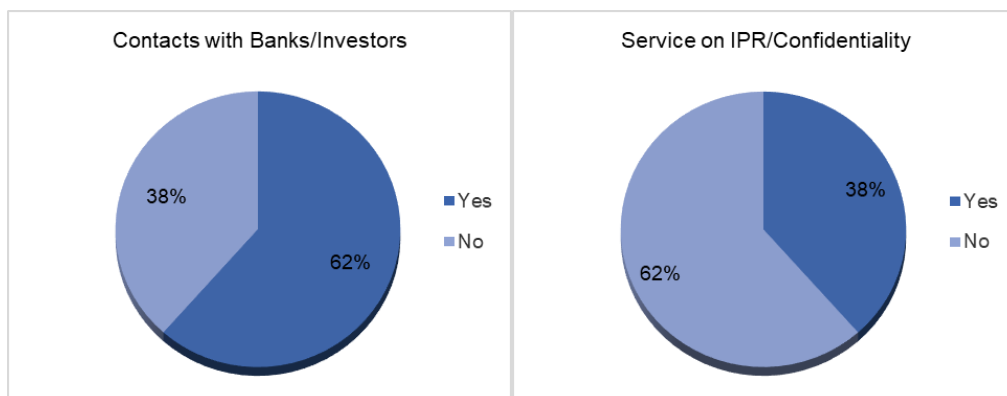
<sup>45</sup> [A European Green Deal](#)

## 4. OUTCOME OF THE SURVEY TO OITBS

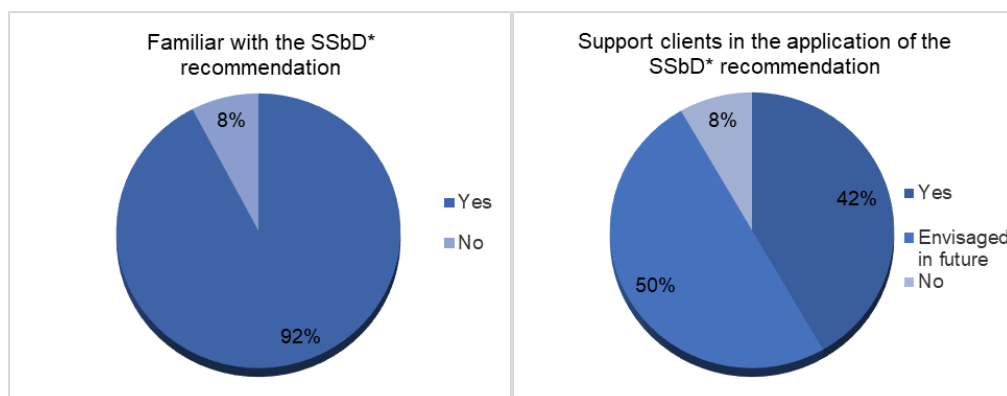
Based on the answers<sup>46</sup> to the questionnaire provided to the coordinators of the OITBs, this section highlights the results and performance of the projects towards their future self-sustainable operation and market readiness.

### 4.1. BEST PRACTICES

62% of OITBs have contacts with banks/investors for customers. 38% of OITBs have a service on Intellectual Property Rights and Confidentiality.



92% of OITBs are familiar with the recommendation on Safe and Sustainable by Design for chemicals and materials<sup>47</sup>. Out of these, 42% support clients in their application and 50% will do it in the future.



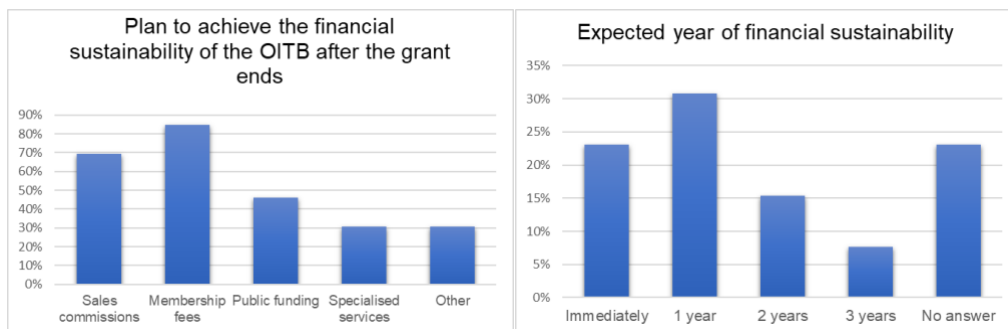
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<sup>46</sup> 13/23 (57%) operational OITBs have replied to the questionnaire with an even reply rate among the 4 generations

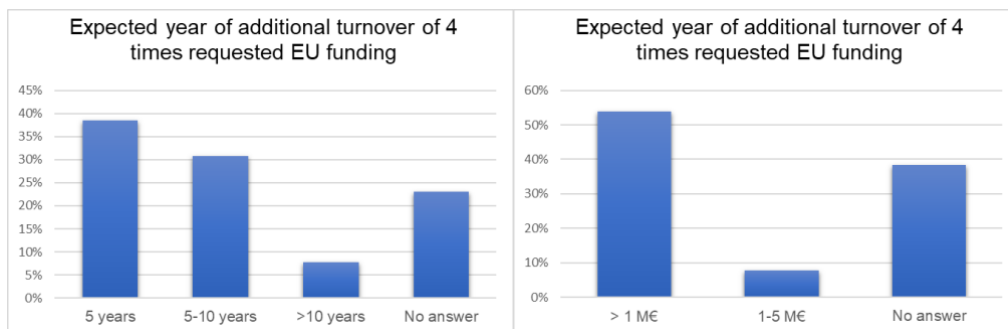
<sup>47</sup> [Recommendation for safe and sustainable chemicals](#)

## 4.2. FINANCIAL SUSTAINABILITY

To achieve financial sustainability, 85% of the OITBs will rely on Membership fees, 69% on sales commissions, 46% on public funding and 31% on specialised services. 23% of the OITBs plan to achieve sustainability immediately after the grant ends, 31% within one year and 15% within two years.

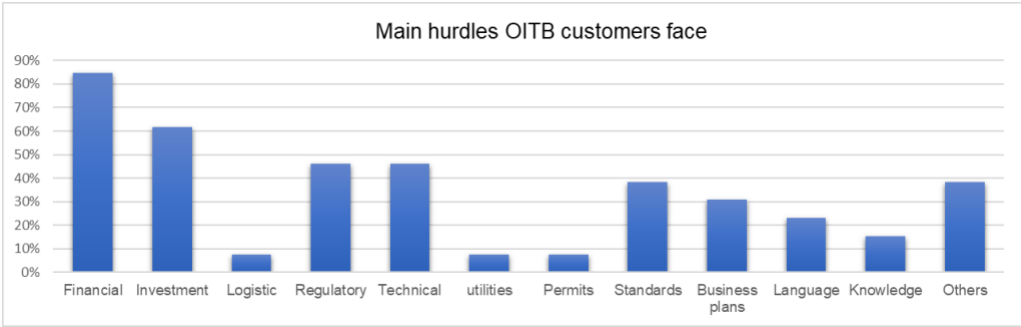


38% of the OITBs expected to have an additional turnover of 4 times the EU funding within 5 years, and a further 31% in 5 to 10 years. So far, 54% of the OITBs had less than 1 M€ of gross revenue and 8% between 1 and 5 million. 38% preferred not to answer. It is important to note that the project phase includes a test of the OITB's business functionality before going to the market and no expected revenue is foreseen or mandatory.



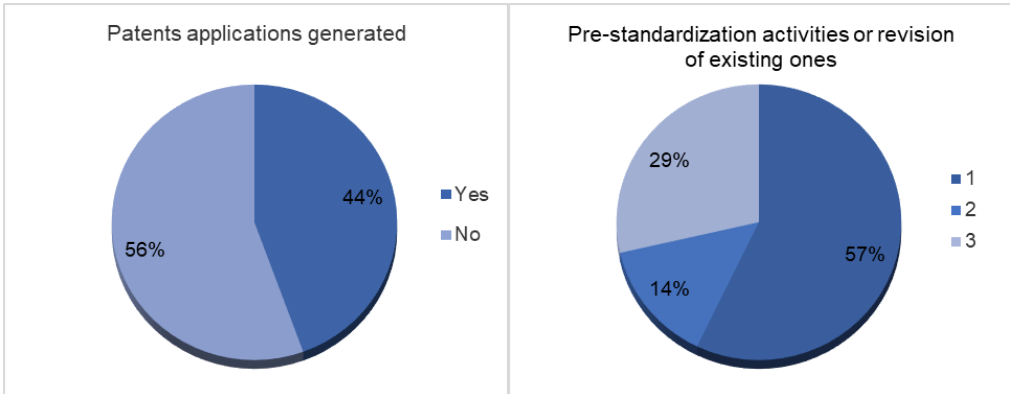
85% of the OITBs do not have particular prices for SMEs, since their services are considered to have a fair price and depend on the activity rather than the customer. The average price charged varies considerably, from 30 000 to 100 000 €, depending on the service and the provider.

The main hurdles customers face are financial (85%), investment (62%), regulatory (46%) and technical (46%).

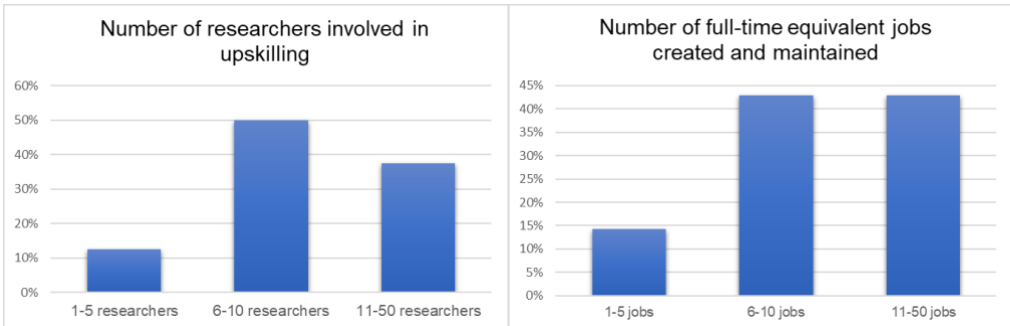


**4.3. SCIENTIFIC AND SOCIETAL IMPACT**

44% of the OITBs have generated patents. 29% of the OITBs have performed three pre-standardisation activities or revisions of existing ones, 14% have performed two, and 57% have performed one.

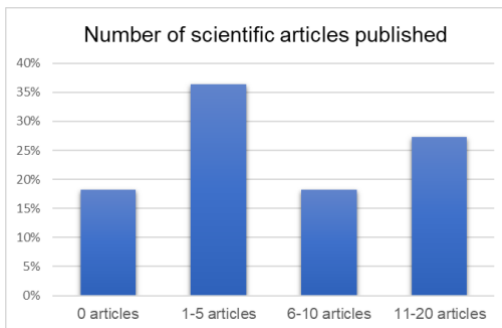


38% of the OITBs have 11 to 50 researchers involved, and 50% have 6 to 10. 43% of them created 11 to 50 full-time jobs, and 43% have created 6 to 10.





27% of the OITBs have published 11 to 20 scientific articles, 18% have published 6 to 10, and 36% have published 1 to 5.

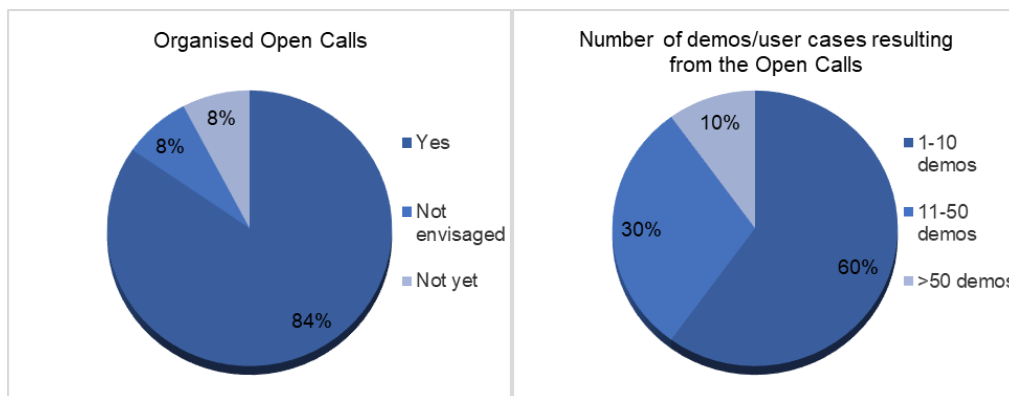


#### 4.4. OUTREACH ACTIVITIES

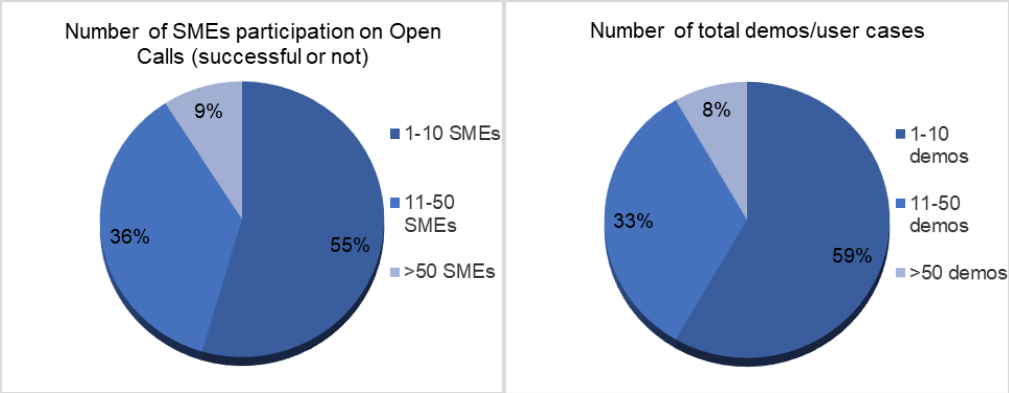
Each OITB's outreach activities vary in number from 15 to 100, in different channels and platforms: thematic conferences and trade fairs, KETMarket Technology Marketplace, project and SEP website, SME-targeted project website, dedicated workshops for SMEs in regional contexts, social media (LinkedIn, Twitter, YouTube), external advisory board members from regional industry associations, etc..

#### 4.5. ECONOMIC AND TECHNOLOGICAL IMPACT

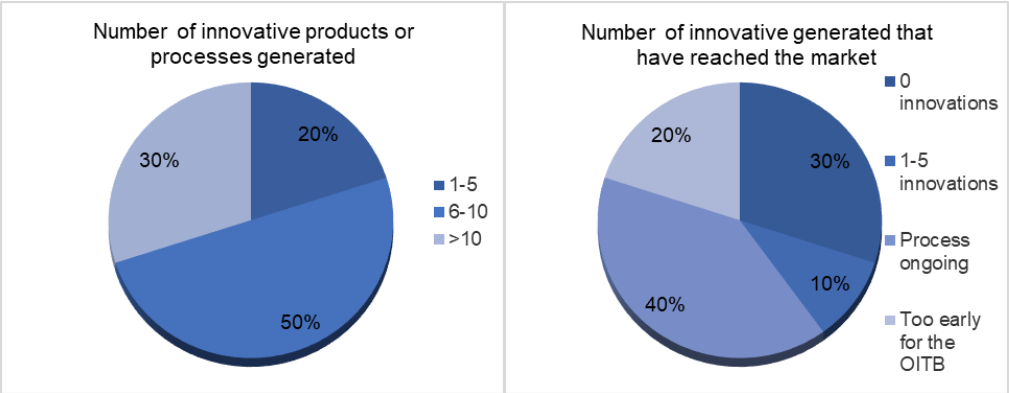
84% of the OITBs have organised Open calls. From the Open Calls, 60% resulted in 1 to 10 demos, 30% resulted in 11 to 50, and 10% resulted in more than 50.



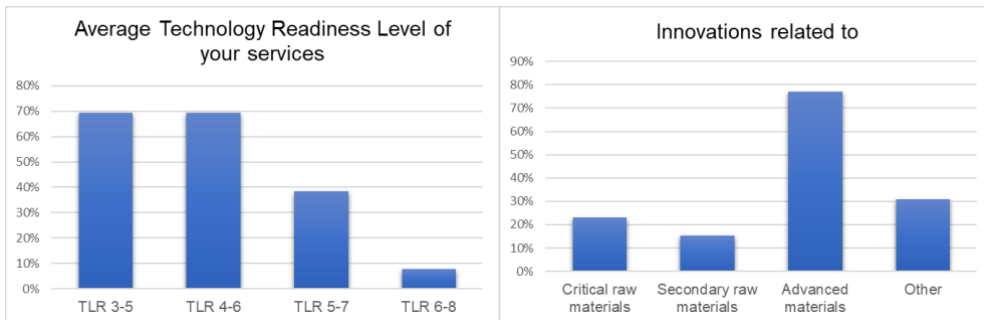
55% of the OITBs had 1 to 10 SMEs applications to the Open Calls, 36% had 11 to 50, and 9% had more than 50 applications. Depending on the OITB, more than 50% of the total demo cases were performed for SMEs. The total of demo cases is higher than the number of demos in the Open Calls, showing that the OITBs are delivering services beyond the Open Calls.



30% of the OITBs have generated more than 10 innovative products or processes, 50% have generated 6 to 10 and 20% have generated 1 to 5. 10% of the OITBs have at least 5 innovations that have reached the market. For 60% it is too early to say, as this is an ongoing process.

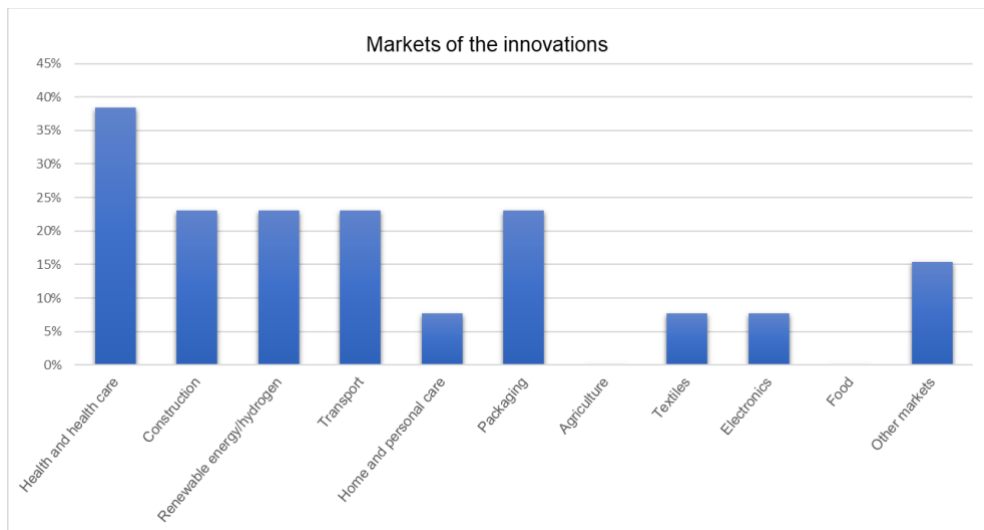


The TRLs of the services range from: 3 to 5 (69%), 4 to 6 (69%), 5 to 7 (38%), and 6 to 8 (8%). 77% of the innovations are related to advanced materials, 31% to other applications, 23% to critical raw materials, and 15% to secondary raw materials.



It is difficult to assess the use of the testing facilities: replies regarding their use ranged between 10 and 50% of the available time.

The markets fields of the OITBs that replied to the questionnaire include: 38% health care; 23% construction, renewable energy and hydrogen, transport and packaging; 8% textiles and electronics; and 15% other markets.



## 5. POTENCIAL AREAS FOR FUTURE OITBS

The New European Innovation Agenda (NEIA)<sup>48</sup> will enhance deep tech innovation in the EU by developing new technologies to address the most pressing societal challenges through five flagship areas.

The second flagship of the agenda focuses on enabling deep tech innovation through experimentation spaces and public procurement. The OITBs have a key role to play within this flagship, as they facilitate innovation through experimentation, and promote the uptake of innovative technologies, products and processes.



The third flagship focuses on accelerating and strengthening innovation in European Innovation Ecosystems, creating the basis for the emergence of connected regional innovation valleys across the EU. This flagship promotes synergies between Horizon Europe and the European Regional Development Fund programme (ERDF). OITBs can benefit directly from these synergies: they are working in different Member States and offering services to SMEs across Europe, thereby contributing to an ecosystem that can be supported by both Horizon Europe and ERDF.

The ERA Policy Agenda Action 12 “accelerates the green/digital transition of Europe’s key industrial ecosystems”, and has a strategic focus on the role of industry and industrial R&I for the twin transitions and increased resilience<sup>49</sup>. Under this action, advanced materials could become a pilot for future technology infrastructures, and OITBs could become a cornerstone in facilitating the uptake of innovations in advanced materials – under a possible Coordinated Plan on Advanced Materials with Member States. Provided that the current OITBs remain successful (also in terms of funding), the following examples for future OITBs could be considered:

- OITB on advanced materials for textiles:

The EU Strategy for Sustainable and Circular Textiles<sup>50</sup> highlight the need to innovate further to strengthen current recycling capabilities of textile waste. By 2025 Member States need to comply with the requirement to separately collect textile waste to prioritise re-use and scale up recycling. According to the technology roadmap for circular technologies and business models in the textile, construction and intensive industries<sup>51</sup>, efforts for maturing and scaling up developments would be needed for the replacement of raw materials with recycled materials.

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<sup>48</sup> [The New European Innovation Agenda](#)

<sup>49</sup> European Commission, Council recommendation on a Pact for Research and Innovation in Europe (13701/21), published on 19 November 2021, [Research and Innovation in Europe](#); European Research Area Policy Agenda overview of actions for the period 2022-2024 [European Research Area Policy Agenda](#)

<sup>50</sup> [EU Strategy for Sustainable and Circular Textiles](#)

<sup>51</sup> [ERA industrial technology roadmap for circular technologies and business models in the textile, construction and energy-intensive industries](#)

- OITBs on testing emerging alternatives of substances of a very high concern (SVHCs):

There is an urgent need for the development of alternatives of SVHCs (e.g. PFAS) across different application areas: chips, med tech, electrolysers, etc. Two of the most common uses of PFAS are the photolithography process (a crucial step in manufacturing microchips<sup>52</sup>); and in fuel cells and other technologies across the hydrogen value chain<sup>53</sup>.

- OITBs on improving (raw) materials efficiency by being recyclable and reusable by design:

These new OITBs could play a role in reducing dependencies of critical raw materials by applying material efficiency strategies and, when possible, substitution with advanced materials. They will be contributing to the Green Deal Industrial Plan<sup>54</sup> and especially to the Critical Raw Materials Act<sup>55</sup>, across five strategic sectors (renewable energy, electromobility, industrial, digital, and aerospace/defence)<sup>56</sup>.

- OITBs on self-healing materials/robotics

Robotics is an essential component in modern manufacturing environment. Factories are increasing their use by 31% annually<sup>57</sup>. Soft sensing technologies could transform robotics, but these technologies consume large amounts of energy and are not sustainable. The solution is to develop materials that can detect when they are damaged, heal themselves and then resume work without the need for human interaction.

- Alignment with the European Digital Innovation Hubs (EDIH)<sup>58</sup>:

EDIHs and OITBs on modelling and characterisation should cooperate closely and complement their services in technical expertise and testing, financial advice, sustainability and circularity. This will help SMEs to have a clear view of the network, to avoid confusions and overlapping and to ensure better coordination of different EU instruments. Such alignment should also integrate modelling and characterisation needs.

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<sup>52</sup> [Chipmakers position on PFAS](#)

<sup>53</sup> [Hydrogen-Europe-position-paper-on-PFAS](#)

<sup>54</sup> [The Green Deal Industrial Plan](#)

<sup>55</sup> [European Critical Raw Materials Act](#)

<sup>56</sup> [JRC - Supply chain analysis and material demand forecast in strategic technologies and sectors in the EU](#)

<sup>57</sup> [International Federation of Robotics](#)

<sup>58</sup> [European Digital Innovation Hubs](#)

## 6. RECOMMENDATIONS

1. OITBs should offer technology expertise, competences on business models, as well as regulatory and financial advice.
2. OITBs should focus on SMEs and their needs as their main clients and target them accordingly via Open Calls.
3. OITBs should improve their proximity to customers with the assistance of the internal marketing departments of consortium members, a network of translators in Member States and Associated Countries where there is no presence, the Enterprise Europe Network (EEN), the M.ERA-NET network, national certification bodies, and National Contact Points (NCPs).
4. The network of OITBs should cluster and jointly develop a label for OITBs, together with the Enterprise Europe Network (EEN), national certification bodies and National Contact Points (NCPs).
5. The OITBs should promote internally, and to their customers and SMEs at large, the Code of Practice on the management of intellectual assets for knowledge valorisation in the European Research Area, for efficient IP licensing for market uptake and societal value creation. The OITBs should dedicate part of their funding to IP protection and exploitation.
6. The OITBs should cooperate with technical committees to promote new standards or revise relevant existing ones.
7. The network of OITBs should inform their members about the most relevant developments in regulations and standards.
8. The OITBs should include in their service portfolio investment advice for SMEs, for example to harness additional private or public funding, and to provide investment and market readiness evaluations for investors.
9. To be successful in the long-term, OITBs should put in place a single-entry point (SEP) during the first year after the start of a publicly funded project, including a financing strategy and a permanent location.
10. To be successful in the long-term, OITBs should identify the unique features and needs of their customers. This should cover the entire lifecycle (testing, pilots, pre-market introduction etc.), to allow services to be prioritised accordingly.
11. Member States and regions should consider opportunities to support the financial sustainability of OITBs after the end of the EU funding, for instance under the exemptions foreseen under the revised State aid rules and the European Regional Development Fund.

## 7. CONCLUSIONS

Open Innovations Test Beds (OITBs) are one form of Technology Infrastructure, which are funded under Horizon 2020 and Horizon Europe. They have been designed at European level to enable innovative small and medium size enterprises (SMEs) to test novel (advanced) materials before bringing them to the market. Up to the present, the EU has supported such OITBs with EUR 319 million. They are expected to be self-financing after the end of their grants, and to achieve – in total – a turnover of more than EUR 1.2 billion by 2030.

In December 2022, the funding of three OITBs (FormPlanet, TEESMAT and OASIS) by Horizon 2020 ended; and by the end of 2023 the funding of seven more (LEE-BD, LightME, LightCoce, TBMED, Safe-N-Medtech, MDOT and i-TRIBOMAT) will finish as well. It is important to draw initial lessons from experience, as guidance for the ongoing and upcoming OITBs, and to provide feedback on the outcomes achieved for the new CORDIS pack of results on OITBs published in June 2023.

The first generation of projects has closed and will continue operating on a self-financed basis. They are likely to face a challenging period in 2023. Projects report that it will be difficult to achieve the additional turnover of at least 4 times the EU funding within 5 years of the end of the grant, and continue to be dependent on public funding.

The OITBs represent an innovative and unique concept of cooperation in testing novel (advanced) materials before bringing them to the market. Suitable especially for SMEs, they are specifically targeting cross national/regional cooperation and have a real potential to support SMEs in bringing their innovations closer to the market. Since their introduction in 2019, individual good examples have emerged in terms of positive impact on specific technological streams, such as in batteries, packaging, transport, nanomedicine, electronics and characterisation. The OITBs also have the advantage of going beyond single Technology Infrastructures (pilot lines, RTOs etc.), since they can support a wider activity cycle, from technology advice and training to business and financial coaching, making the OITBs a potentially appropriate choice for a SME.

This report shows examples of good practice; identifies challenges in setting up these complex multi-stakeholder entities; and provides relevant recommendations to boost long-term sustainability. Current projects showcased excellent scientific performance, however they are encountering two main challenges: a lack of visibility and a need for a sustainable business model.

The first generation of OITBs, which started in 2019, lacked sufficient visibility and was not able to attract enough SMEs as clients. The first projects launched Open Calls offering financial support to SMEs to use their services but attracted fewer than 20 applications. More recent OITBs, which started in 2020, are expecting to attract more than 100 applications. The OITBs need to attract many more applications from SMEs to develop a customer base large enough to ensure financial sustainability in the medium-to-long term. Effective dissemination work and knowledge of marketing instruments are needed to increase their visibility and make SMEs aware of their potential.

The second challenge, which is closely related to the first, is the need to put in place a profitable business model by selling services to their clients and offering to them financial advice or support to access finance (private or public investments). Single-Entry Points

(SEP) need to be at the heart of a cost-based system and to be functionally designed from the start of the project, in order to facilitate collaboration between partners.

The recommendations of this report aim to improve the OITBs visibility, functionality, efficiency, and sustainability, and to help establish an interconnected innovation ecosystem that will make this instrument crucial in the support of the European Green Deal and the Twin Transition.

The implementation of the New European Innovation Agenda, the ERA Policy Agenda Action 12 and the discussions on the Coordinated Plan on Advanced Materials with Member States illustrate the need to urgently step-up efforts to accelerate research and innovation in advanced materials and to grow the necessary innovation ecosystems – an opportunity the OITBs should not miss.



# ANNEX

This report is based on data, facts and figures extracted from the CORDIS Result pack on OITBs<sup>59</sup> of May 2022 and its update of June 2023; two webinars with stakeholders in April and May of 2023 to discuss the recommendations; a questionnaire for the coordinators on project results; past workshops and conferences; meetings with experts; several articles and analyses; the monitoring of the projects; and the constant exchange of insights between Project Advisers from HaDEA, coordinators from the projects and Policy Officers from DG R&I.

Table 3. OITB project data

PROJECT ACRONYM	PROJECT TITLE	PROJECT REQUESTED EU CONTRIB	PROJECT START DATE	PROJECT END DATE
<b>Open Innovation Test Beds for Lightweight, nano-enabled multifunctional composite materials and components (IA)</b>				
LEE-BED	Innovation test bed for development and production of nanomaterials for lightweight embedded electronics	€ 10.696.766,25	1/01/2019	31/12/2022
LightMe	An Open Innovation Ecosystem for upscaling production processes of lightweight metal alloys composites	€ 11.057.990,38	1/01/2019	30/06/2023
LightCoce	Building an Ecosystem for the up scaling of lightweight multi-functional concrete and ceramic materials and structures	€ 11.096.720,93	1/01/2019	30/06/2023
OASIS	Open Access Single entry point for scale-up of Innovative Smart lightweight composite materials and components	€ 11.757.065,75	1/01/2019	31/11/2022
<b>Open Innovation Test Beds for Safety Testing of Medical Technologies for Health (IA)</b>				
TBMED	A testing bed for the development of high-risk medical devices	€ 8.480.543,89	1/01/2019	28/09/2023
SAFE-N-MEDTECH	Safety Testing in the life cycle of nanotechnology-enabled medical technologies for Health	€ 14.534.365,88	1/04/2019	30/09/2023
MDOT	Medical Device Obligations Taskforce	€ 8.348.633,50	1/01/2019	31/12/2023
<b>Open Innovation Test Beds for Characterisation (IA)</b>				
TEESMAT	Open Innovation Test Bed for Electrochemical Energy Storage Materials	€ 8.900.252,16	1/01/2019	31/08/2022
i-TRIBOMAT	Intelligent Open Test Bed for Materials Tribological Characterisation Services	€ 7.113.313,88	1/01/2019	31/03/2023

<sup>59</sup> [Open Innovation Test Beds to accelerate European innovation](#)

PROJECT ACRONYM	PROJECT TITLE	PROJECT REQUESTED EU CONTRIB	PROJECT START DATE	PROJECT END DATE
FormPlanet	Sheet metal forming testing hub	€ 6.907.432,50	1/01/2019	31/12/2021
Open Innovation Test Beds for nano-enabled surfaces and membranes (IA)				
NextGen Microfluidics	Next generation test bed for upscaling of microfluidic devices based on nano-enabled surfaces and membranes	€ 14.692.025,51	1/04/2020	30/09/2024
NewSkin	Innovation Eco-system to Accelerate the Industrial Uptake of Advanced Surface Nano-Technologies	€ 14.998.893,50	1/04/2020	31/03/2024
FlexFunction 2Sustain	Open Innovation Ecosystem for Sustainable Nano-functionalized Flexible Plastic and Paper Surfaces and Membranes	€ 14.231.400,00	1/04/2020	31/03/2024
INNOMEM	Open Innovation Test Bed for nano-enabled Membranes	€ 14.716.872,26	1/05/2020	30/04/2024
Open Innovation Test Beds for nano-enabled bio-based materials (IA)				
BIOMAC	European Sustainable BIObased nanoMATERIALS Community (BIOMAC)	€ 14.807.314,50	1/01/2021	31/12/2024
INN-PRESSME	open INNnovation ecosystem for sustainable Plant-based nano-enabled biomateRials deploymEnt for packaging, tranSport and conSuMEr goods	€ 14.484.959,51	1/01/2021	31/01/2025
BIONANO POLYS	Open Innovation Test Bed for Developing Safe Nano-Enabled Bio-Based Materials and Polymer Bionanocomposites for Multifunctional and new advanced Applications	€ 11.756.623,63	1/01/2021	31/12/2024
BIOMAT	An Open Innovation Test Bed for Nano-Enabled Bio-Based PUR Foams and Composites	€ 14.588.169,63	1/01/2021	31/12/2024
Open Innovation Test Beds for materials for building envelopes (IA)				
iclimabuilt	Functional and advanced insulating and energy harvesting/storage materials across climate adaptive building envelopes	€ 14.999.167,63	1/03/2021	28/02/2025
MEZeroE	Measuring Envelope products and systems contributing to next generation of healthy nearly Zero Energy Buildings	€ 14.728.371,75	1/01/2021	31/01/2026
META BUILDING LABS	METAclustered, SME oriented European Open Innovation Test Bed for the BUILDING envelope materials industrial sector using a harmonised and upgraded technical framework and living LABS	€ 14.944.528,75	1/01/2021	31/01/2026

PROJECT ACRONYM	PROJECT TITLE	PROJECT REQUESTED EU CONTRIB	PROJECT START DATE	PROJECT END DATE
Open Innovation Test Beds for nano-pharmaceuticals production (IA)				
Phoenix	Pharmaceutical Open Innovation Test Bed for Enabling Nano-pharmaceutical Innovative Products	€ 11.102.823,04	1/03/2021	28/02/2025
Open Innovation Platform for Materials Modelling (RIA)				
VIPCOAT	Virtual Open Innovation Platform for Active Protective Coatings Guided by Modelling and Optimization	€ 5.519.625,00	1/05/2021	30/04/2025
OpenModel	Integrated Open Access Materials Modelling Innovation Platform for Europe	€ 5.194.218,75	1/02/2021	31/01/2025
MUSICODE	An experimentally-validated multi-scale materials, process and device modeling & design platform enabling non-expert access to open innovation in the organic and large area electronics industry	€ 4.992.000,00	1/01/2021	31/12/2024
Open Innovation Test Beds for Climate Neutral and Circular Innovative Materials Technologies (IA)				
Convert2Green	Converting Facilities Network for accelerating uptake of climate neutral materials in innovative products	€ 11.383.137,00	01/01/2023	31/12/2025
CLEANHYPRO	Open Innovation Test Bed for Electrolysis Materials for Clean Hydrogen Production	€ 11.721.895,00	tbc	tbc
Exploit4InnoMat	An Open Innovation Ecosystem for exploitation of materials for building envelopes towards zero energy buildings	€ 11.696.972,00	01/01/2023	31/12/2026

Table 4. OITB project locations and contact details

PROJECT ACRONYM	COORDINATOR MS & AC	PARTNERS MS & AC	COORDINATOR ORGANISATION	PROJECT WEBSITE
Open Innovation Test Beds for Lightweight, nano-enabled multifunctional composite materials and components (IA)				
LEE-BED	DK	UK, NL, NL, SE, ES, DE, FR, NL, ES, DE, DK, ES, ES, AT, ES, ES, ES, ES	Teknologisk Institut – Website: <a href="http://www.teknologisk.dk">www.teknologisk.dk</a>	<a href="https://lee-bed.eu/">https://lee-bed.eu/</a>
LightMe	IT	DE, ES, UK, DE, TR, BE, SI, PL, BE, IT, PT, CZ, EL, EE, IT, IT, AT, ES, EL, IT, BE, UK, FR	Politecnico Di Milano - Website: <a href="http://www.polimi.it">www.polimi.it</a>	<a href="https://www.lightme-ecosystem.eu/">https://www.lightme-ecosystem.eu/</a>
LightCoce	EL	SE, ES, EL, DE, EL, SE, EL, NL, DE, IT, ES, PL, PT, ES, ES, PL, BE, IT, DE, DE, IT, ES, DE, EL	National Technical University Of Athens - Website: <a href="http://www.ntua.gr">www.ntua.gr</a>	<a href="https://www.lightcoce-oitb.eu/">https://www.lightcoce-oitb.eu/</a>
OASIS	ES	FR, FR, DE, ES, EL, DE, ES, PL, ES, EL, ES, FR, DE, EL, NL, ES, FR, CZ, ES, CZ	Fundacion Tecnalía Research & Innovation - Website: <a href="http://www.tecnalia.com">www.tecnalia.com</a>	<a href="https://project-oasis.eu/">https://project-oasis.eu/</a>
Open Innovation Test Beds for Safety Testing of Medical Technologies for Health (IA)				
TBMED	ES	ES, ES, DE, FR, FR, ES, ES, DE, IE, FR, FR, ES, ES, ES, ES, ES, ES, ES	Fundacion Cidetec - Website: <a href="http://www.cidetec.es">www.cidetec.es</a>	<a href="https://tbmed.eu/">https://tbmed.eu/</a>
SAFE-N-MEDTECH	ES	ES, NO, CO, RO, ES, RS, ES, BE, IT, FR, IE, UK, NO, PT, PT, IT, DE, UK, BE, FI, EL, IT, BE	Departamento De Salud Gobierno Vasco - Website: <a href="http://www.euskadi.eus/gobierno-vasco/departamento-salud/inicio/">http://www.euskadi.eus/gobierno-vasco/departamento-salud/inicio/</a>	<a href="https://safenmt.com/">https://safenmt.com/</a>
MDOT	DE	NL, NL, NL, NL, NL, NL, DE, NL, ES, DE, DE, DE, DE, AT, UK, AT, PL, UK, CH, LU	Fraunhofer Gesellschaft zur Foerderung der Angewandten Forschung E.V. - Website: <a href="http://www.fraunhofer.de">www.fraunhofer.de</a>	<a href="https://mdot.eu/">https://mdot.eu/</a>
Open Innovation Test Beds for Characterisation (IA)				
TEESMAT	FR	FR, FR, FR, DE, BE, ES, EL, FR, HU, LU, FR, UK, IT, BE, FR, UA, FR, FR, EL, SE, IT, ES, BE, ES, IT	Commissariat a l'Energie Atomique et aux Energies Alternatives - Website: <a href="http://www.cea.fr">www.cea.fr</a>	<a href="https://www.teesmat.eu/">https://www.teesmat.eu/</a>

PROJECT ACRONYM	COORDINATOR MS & AC	PARTNERS MS & AC	COORDINATOR ORGANISATION	PROJECT WEBSITE
i-TRIBOMAT	AT	ES, DE, ES, UK, SE, FI, BE, FI, ES	Ac2t Research GMBH - Website: <a href="http://www.ac2t.at">www.ac2t.at</a>	<a href="https://www.i-tribomat.eu/">https://www.i-tribomat.eu/</a>
FormPlanet	ES	DE, SE, IT, CZ, IT, UK, ES, ES, FR, ES, ES, TR, IT, ES, SE, SE	FUNDACIO EURECAT - Website: <a href="http://www.eurecat.org/">www.eurecat.org/</a>	<a href="https://formplanet.eu/">https://formplanet.eu/</a>
Open Innovation Test Beds for nano-enabled surfaces and membranes (IA)				
NextGen Microfluidics	AT	DE, AT, AT, ES, AT, ES, RS, AT, DE, EL, AT, DK, ES, NL, DE, DE, FR, DE, HR, AT, DE, AT	Joanneum Research Forschungsgesellschaft MBH - Website: <a href="http://www.ioanneum.at">www.ioanneum.at</a>	<a href="https://www.nextgenmicrofluidics.eu/">https://www.nextgenmicrofluidics.eu/</a>
NewSkin	BE	DE, DE, DE, SE, SE, IE, IL, BE, ES, ES, ES, ES, IT, AT, ES, FR, FR, FR, IT, FR, ES, RO, FR	Convention Europeenne de la Construction Metallique ASBL - Website: <a href="http://www.steelconstruct.com">www.steelconstruct.com</a>	<a href="https://www.newskin-oitb.eu/">https://www.newskin-oitb.eu/</a>
FlexFunction 2Sustain	DE	AT, EL, DE, CH, DE, EL, FR, EL, FR, PT, EL, DE, AT, IT, DE, PT, PT, DE, CZ	Fraunhofer Gesellschaft zur Foerderung der Angewandten Forschung E.V. - Website: <a href="http://www.fraunhofer.de">www.fraunhofer.de</a>	<a href="https://flexfunction2sustain.eu/">https://flexfunction2sustain.eu/</a>
INNOMEM	ES	NL, IT, BE, ES, UK, UK, DE, DE, EL, FR, FR, NL, DE, DE, EL, DK, FR, DE, DE, EL, EL, EL, DE, DE	Fundacion Tecnalía Research & Innovation - Website: <a href="http://www.tecnalia.com">www.tecnalia.com</a>	<a href="https://www.innomem.eu/">https://www.innomem.eu/</a>
Open Innovation Test Beds for nano-enabled bio-based materials (IA)				
BIOMAC	EL	BE, IT, HR, SE, BE, LU, SE, DE, UK, ES, DE, EL, ES, ES, IT, DK, EL, ES, DE, ES, PL, EL, DE, IT	Aristotelio Panepistimio Thessalonikis - Website: <a href="http://www.auth.gr">www.auth.gr</a>	<a href="https://www.biomac-oitb.eu/">https://www.biomac-oitb.eu/</a>
INN-PRESSME	FI	ES, FR, FR, DE, ES, SE, SE, SE, PL, ES, FI, ES, FR, UK, IT, ES, ES, BE, BE, DE, HU, ES, DE, FI	Teknologian Tutkimuskeskus VTT OY - Website: <a href="http://www.vtt.fi">www.vtt.fi</a>	<a href="https://www.inn-pressme.eu/">https://www.inn-pressme.eu/</a>
BIONANO POLYS	ES	ES, ES, FR, PT, DE, NL, AT, PL, RO, FR, ES, BE, PT, HR, BE, BE, BE, DE, IT, ES, ES, IT, PT, UK	Instituto Tecnológico del Embalaje, Transporte y Logística - Website: <a href="http://www.itene.com">www.itene.com</a>	<a href="https://www.bionanopolys.eu/">https://www.bionanopolys.eu/</a>

PROJECT ACRONYM	COORDINATOR MS & AC	PARTNERS MS & AC	COORDINATOR ORGANISATION	PROJECT WEBSITE
BIOMAT	PT	DE, ES, IT, DE, DE, UK, UK, FR, IT, ES, ES, IL, IT, ES, IL, DE, PT, IT, ES, LV, IT, IL, IL, ES	CENTITVC - Centro de Nanotecnologia e Materiais Tecnicos Funcionais e Inteligentes Associacao - Website: <a href="http://www.centi.pt">www.centi.pt</a>	<a href="https://biomat-testbed.eu/">https://biomat-testbed.eu/</a>
Open Innovation Test Beds for materials for building envelopes (IA)				
iclimabuilt	EL	ES, DE, NO, NO, SE, PT, BE, UK, UK, DE, ES, CY, DE, IT, ES, BE, EE, DK, CH, IT, PL, UK, DE, UK, EL, DE	National Technical University of Athens - NTUA - Website: <a href="http://www.ntua.gr">www.ntua.gr</a>	<a href="https://iclimabuilt.eu/">https://iclimabuilt.eu/</a>
MEZeroE	IT	IT, ES, AT, SI, PL, ES, DK, ES, IT, IT, DK, DK, ES, DE, ES, PL, IT, SI, ES, UK, CH, IT, ES, CH	Accademia Europea di Bolzano - Website: <a href="http://www.eurac.edu">www.eurac.edu</a>	<a href="https://www.mezeroe.eu/">https://www.mezeroe.eu/</a>
META BUILDING LABS	FR	BE, BE, BE, BE, ES, SE, DE, AT, HU, PL, IE, DE, BE, UK, LU, FR, FR, FR, FR, FR, FR, FR, FR, IT	Nobatek Inef 4 - Website: <a href="http://www.nobatek.inef4.com">www.nobatek.inef4.com</a>	<a href="https://metabuilding-labs.eu/">https://metabuilding-labs.eu/</a>
Open Innovation Test Beds for nano-pharmaceuticals production (IA)				
Phoenix	LU	ES, ES, AT, AT, DE, ES, HR, AT, NL, DE, ES	Luxembourg Institute of Science and Technology - Website: <a href="http://www.list.lu">www.list.lu</a>	<a href="https://www.phoenix-oitb.eu/">https://www.phoenix-oitb.eu/</a>
Open Innovation Platform for Materials Modelling (RIA)				
VIPCOAT	DE	DE, DE, NL, BE, UK, DE, PT, NO, LU, NO, NO, BE, NL	Helmholtz-Zentrum Geesthacht Zentrum Fur Material- Und Kustenforschung GMBH - Website: <a href="http://www.hereon.de">www.hereon.de</a>	<a href="https://ms.hereon.de/vipcoat/">https://ms.hereon.de/vipcoat/</a>
OpenModel	DE	IT, IT? AT, IT, BE, UK, BE, DE, BE, UK, NO, NO, NO, CH	Fraunhofer Gesellschaft zur Foerderung der Angewandten Forschung E.V. - Website: <a href="http://www.fraunhofer.de">www.fraunhofer.de</a>	<a href="https://www.open-model.eu/">https://www.open-model.eu/</a>
MUSICODE	EL	DE, UK, EL, CZ, CH, DE, UK, IT, EL, DE	Panepistimio Ioanninon - Website: <a href="http://www.uoi.gr">www.uoi.gr</a> / <a href="http://www.rc.uoi.gr">www.rc.uoi.gr</a>	<a href="http://musicode.eu/">http://musicode.eu/</a>

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Open innovation Test Beds (OITBs) are one form of Technology Infrastructures that offer services for the development, testing and upscaling of advanced materials. The implementation of the New European Innovation Agenda, the ERA Policy Agenda Action 12 and the discussions on the Coordinated Plan on Advanced Materials illustrate the need to urgently step-up efforts to accelerate research and innovation in advanced materials. The present report explores the challenges, opportunities, best practices and recommendations to stakeholders to support the further implementation of the OITBs.

*Research and Innovation policy*

