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FlexFunction2Sustain

Open Innovation Ecosystem for Sustainable Nano-functionalized Flexible Plastic and Paper Surfaces and Membranes

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= Deliverable D8.4 =

Report from 1st joint workshops with cluster initiatives

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Executive Summary

Deliverable 8.4 summarises the outcomes of the clustering and integration activities of the FlexFunction2Sustain project with other Open Innovation Test Beds (OITBs) and complementary cluster initiatives, namely the European Materials Characterisation Council (EMCC), European Materials Modelling Councils (EMMC) and the NanoSafety Cluster, all linked through members of the Project External Advisory Board (EAB).

To enable uptake by industry, especially SMEs and start-ups, the Horizon 2020 Framework Programme has supported the creation of an open innovation ecosystem in advanced materials. The Commission has invested approximately 250 million euro in Open Innovation Test Beds (OITBs) with the aim to bring nanotechnologies and advanced materials within market reach by providing access to demonstration and upscaling facilities as well as advisory services to advance technologies from laboratory validation to prototypes in industrial environments. Currently there are 22 OITB projects in the areas of advanced medical technologies, nano-pharmaceuticals, lightweight nano-enabled composite materials, materials characterization, membranes and surfaces, bio-based materials and materials for building envelopes. This open innovation ecosystem aims at gathering all the relevant actors while covering all relevant enablers and services needed for innovation based on new materials, therefore reducing technological risk thus attracting more investors and cutting the time to market.

The potential of the OITBs can only be fully exploited with the support of complementary initiatives able to promote coordination mechanisms among the OITB community. The European Network for Pilot Production Facilities and Innovation Hubs (EPPN) European Materials Characterisation Council (EMCC), the European Materials Modelling Council (EMMC) and the Nanosafety Cluster are among the most notable examples of such complementary initiatives.

In practical terms, this clustering and integration with the OITBs ecosystem are aimed at taking stock from current policy initiatives and open innovation test beds in order to share good practices and lessons learnt as well as to get new ideas to effectively support the nano-enabled industry enabled and the Advanced Materials European Innovation Ecosystem in the context of the new framework programme Horizon Europe. While the original idea was to promote this exchange through the organisation of annual joint and hands-on workshops involving all the relevant stakeholders (OITBs, representatives from EU cluster initiatives and companies and other end-users), the COVID-19 pandemic situation made it unfeasible to organise a public gathering and has led to some adjustments in the implementation of task 8.2 - Clustering and Integration to the OITB Ecosystem and the EPPN, EMMC, EMCC, and NanoSafety Cluster.

In this context the implementation of task 8.2 has kick started with the organisation of regular bilateral exchange meetings with some of these initiatives. The first joint workshop will take place by month 14 (May 2021) as a satellite event of the EuroNanoForum 2021. This first workshop will give participants the opportunity to share their experience, expectations and new ideas to bring nanotechnologies and advanced materials within the reach of companies and users. At least two more stakeholders' workshops will be organised throughout the life-span of the FlexFunction2Sustain project.

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1. Introduction

It is expected that test beds link with other existing OITBs with an aim of cooperating in a regular way to exchange services, as well as the outcomes of their experience in providing services, with the final goal of ensuring a systemic sustainability. This can only be achieved through coordination and networking with other test beds as well as with other innovation ecosystems in the EU, whether European, national or regional. This is the rationale behind the implementation of task 8.2 - Clustering and Integration to the OITB Ecosystem and the EPPN, EMMC, EMCC, and NanoSafety Cluster- which has led to the interactions and exchanges described in this deliverable.

An OITB is a set of entities providing common access to physical facilities, capabilities and services, to companies and users, required for the development, testing and upscaling of nanotechnology and advanced materials, covering from validation in a laboratory (TRL 4) to prototypes in industrial environments (TRL 7).

Currently there are 16 OITB projects running 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

Three Open Innovation Test Beds for materials characterisation and three Open Innovation Test Beds for modelling have also been funded. A list of the OITBs is provided in Annex I.

Test beds are expected to form European networks of competences along the entire value chain and match the needs of industry by providing users with easy access to facilities, at different locations as needed. Besides pooling resources, OITBs are expected to setup networks among themselves as a way of accessing complementary services according to users' needs. System sustainability can only be ensured if testbeds cooperate in a regular way with the central aim of addressing industry needs by promoting a broad and consolidated access to physical facilities, capabilities and services across Europe. The FlexFunction2Sustain consortium is therefore committed with the creation of a more open and connected European innovation ecosystem.

Deliverable D8.4 is divided in two main sections:

- Section 2 describes the interactions that have been taken with other OITBs and cluster initiatives
- Section 3 describes the short term plan in terms of integration activities with other OITBs and cluster initiatives.

2. Interactions with other OITBs and clustering initiatives

FlexFunction2Sustain is currently in direct contact with the following OITBs and cluster initiatives

- **NextGenMicrofluidics** - Next generation test bed for upscaling of microfluidic devices based on nano-enabled surfaces and membranes (Nano-enabled surfaces and membranes)
- **NewSkin** - Innovation Eco-system to Accelerate the Industrial Uptake of Advanced Surface Nano-technologies (Nano-enabled surfaces and membranes)
- **INNOMEM** - Open Innovation Test Bed for nano-enabled Membranes (Nano-enabled surfaces and membranes)
- **Safe-N-Medtech** - Safety testing in the life cycle of nanotechnology- enabled medical technologies for health (Safety Testing of Medical Technologies for Health)
- **OASIS** - Open Access Single entry point for scale-up of Innovative Smart lightweight composite materials and components (Lightweight nano-enabled multifunctional materials and components)
- **INN-PRESSME** - open INNnovation ecosystem for sustainable Plant-based nano-enabled biomateRIals deployment for packaging, transport and conSuMEr goods (Bio-based nano-materials and solutions)
- **NanoSafetyCluster** – Clustering and Networking Initiative to coordinate nanosafety research in Europe deriving strategic advice for the EU and the member states
- **FormPlanet** – An Open Innovation Test Bed offering advanced testing methodologies for more accurate metals characterization, non-destructive in-process measurements and modeling for high strength sheet materials.
- **European Material Characterisation Council** – FHG is – through linked projects NanoQI and Switch2Save in continuous exchange with EMCC supporting metadata format developments (CHADA database) and supporting strategy development of the EMCC
- **MDOT** – Platform to support medical device manufacturers' need for support with the obligatory conformity assessment. Same as FlexFunction2Sustain, the MDOT OITB is coordinated by Fraunhofer.

Further, FlexFunction2Sustain holds close contact and regular experience exchange with other projects funded with in the scheme of Digital Innovation Hubs and Open Access Pilot Lines, including the PHABULOuS Pilot Line for Free Form Micro Optics or the SmartEEs Marketplace for Flexible Electronics. These regular exchange is in line with the EU expectation of close collaboration of all OITB and of increasing visibility and SME customer base for the whole OITB ecosystem. Main aspects focused in these regular information exchange:

- Business models planned for the different OITBs and sustainability;
- Progress in the creation of the Single Entry Point and the OITB legal structure;
- Discuss how to broad access to materials development facilities and services across Europe;
- Complementarity of the Service and Product Portfolio of the OITBs
- Intelligence on EU regulations as a way of streamlining the materials development process;
- Organisation of jointly workshops with the view of exchanging experiences and best practices as well as to promote the OITBs services' offer to users.
- Joint forces towards standardization in the field of sustainable plastics, flexible electronics, and packaging, characterisation and revision of existing standards where needed

These preliminary interactions have shown a clear need for different stakeholders to engage with and between all the relevant players of the advanced materials development ecosystem with the final goal of promoting open innovation among all the players, especially SMEs. Besides creating a strong awareness of the OITB ecosystem through a customer-oriented communication and dissemination, this multiplier effect requires strong integration and coordination among the OITBs community and related stakeholders. To promote this, the FlexFunction2Sustain consortium plans to organise minimum three joint workshops gathering representatives from the different European cluster initiatives with the OITBs community. The following session describes the plan for the first of these workshops.

3. Planned integration activities

Within the aim of task T8.2 - Clustering and Integration to the OITB Ecosystem and the EPPN, EMMC, EMCC, and Nanosafety Cluster (joint workshops), we are currently organising the first stakeholders' joint workshop as a satellite event of the EuroNanoForum 2021 conference. This workshop is already being planned with the support of other OITBs, namely the Safe-N-Medtech.

The objective of the workshop is to take stock from current policy initiatives and open innovation test beds in order to get new ideas to support the Advanced Materials European Innovation Ecosystem in the context of Horizon Europe. OITBs, related clustering initiatives and end-users will have the opportunity to share their experience, expectations and new ideas to bring nanotechnologies and advanced materials within the reach of companies and users.

Workshop “Open Innovation Test Beds as a Service to the Industry”

Virtual Event

Close Session (only to OITB participants)
May 4th 2021, 09:30 – 12:00

Open Session
May 4th 2021, 14:00 – 17:30

(Satellite event from **EuroNanoForum 2021**)

Close Session

(Only through invitation directed to all OITB participants)

May 4th 2021
09:30 – 12:00

5' 9:30 – 9:35	Welcome Session Moderator for all two OITB Morning sessions : from EC
50" 09:35 – 10:25 (OITB internal)	Lessons Learned from 1st Generation OITB business: Open calls and transition to sustainability phase <i>Format: round table with 5 speakers from 1st generation OITBs</i> Time for Q&A
10' 10:25 – 10:35	Break
85' 10:35 – 12:00	OITBs – Development of new Business Model and SEP structures (in the second generation of OITBs) <i>Format: round table discussion with representatives from 1st and 2nd generation OITBs. No ppt needed.</i>

(OITB internal)	<p><i>Objective: Make all ecosystem aligned. Learn about different OITB business models and identify commonalities and challenges.</i></p> <p>PART A: Business models – What are you going to sell? What is your market?</p> <p>Three talks. Discussion topics:</p> <ul style="list-style-type: none"> ○ OITB creates products => SEP is pure exclusive sales dept. ○ SEP is consultant to customer ○ SEP as ecosystem manager (networking agent, data) ○ SEP as "realizer" and "finance supprt" for new products ○ any other business model <p>PART B: Legal Structures</p> <p>Three talks. Discussion topics:</p> <ul style="list-style-type: none"> ○ SEP alone without association owned by members Association alone – members act as SEP (Pilot Line PHABULOUS) ○ Association owns SEP (NGM) ○ Association loosely linked to private SEP (if one of this is already established ?) <p>Time for Q&A (of both sessions together) 30 minutes free discussion</p>
12:00	End of Close Session

Open Session

(Target Audience: OITBs, Industry, Industry Associations, other projects likely to integrate results to OITB service portfolio and the European Commission)

May 4th 2021

14:00 – 17:30

15' 14:00 – 14:15	<p>Opening Session</p> <ul style="list-style-type: none"> - Peter Droell, European Commission DG RTD, Head of Prosperity Directorate
10' 14:15 – 14:25	<p>What is an OITB and How does it make industries' life easier?</p> <p><i>Format: Short introduction "What is an OITB and How it makes life easier for SMEs and large companies?". Marketing for the whole OITB ecosystem.</i></p> <p style="text-align: center;">-</p>
50' 14:25 – 15:15	<p>Expectations of users towards an OITB</p> <p><i>Format: round table with representatives from companies involved with OITBs. Speakers should avoid big power points, max. 1-2 slides, total of 5 talks. Users should focus on the needs. Main question: What should an OITB serve for so that customers are willing to pay for the services?</i></p> <p>Time for Q&A</p>
10' 15:15 – 15:25	Break
115' 15:25 – 17:30	Open Innovation Test Beds as a Service to the Industry (1st part)

(12 slots)	<p><i>Format: Short presentation about 12 OITB – to attract customers (1st and 2nd generation)! OITBs must express their interest to present. After having enough OITB we should group them in two sessions. Questions to be answered (5-7 minutes speaking) – Sales Pitch to customers</i></p> <ul style="list-style-type: none"> - <i>What is your Technological Area of Expertise [1 slide]?</i> - <i>What is Service Portfolio for the Customers [1 slides]?</i> - <i>What is the added value for the customers [1 slide]?</i> - <i>How is the service portfolio delivered [1 slide: Contact / SEP..]?</i> <p><i>Session will be organised by thematic areas depending on the EoIs received. Following this arrangements, OITBs' presentations will be divided at least in 4 slots followed by a time from Q&As.</i></p>
17:30	End of workshop

4. Conclusions

The outcomes of the workshop “Open Innovation Test Beds as a Service to the Industry” will be circulated among all participants and later reported in deliverable Report from 2nd joint workshops with cluster initiatives which has a public dissemination level (Month 24).

The FlexFunction2Sustain team will continue to promote the regular exchanges with an increased number of OITBs and cluster initiatives and has already planned a second workshop to be held during the first half of 2022.

5. Degree of progress

The deliverable is 100% fulfilled.

6. Dissemination level

The Deliverable D8.4 is public and therefore it will be available to download on the project’s website.

7. ANNEX I: List of OITBs per funded topic and technology domain

Project Topic Code	Topic Descr	Project Acronym	Project Name
DT-NMBP-01-2018	Open Innovation Test Beds for Lightweight, nano-enabled multifunctional composite materials and components (IA)	LEE-BED	Innovation test bed for development and production of nanomaterials for lightweight embedded electronics
		LightCoce	Building an Ecosystem for the up-scaling of lightweight multi-functional concrete and ceramic materials and structures
		LightMe	An Open Innovation Ecosystem for upscaling production processes of lightweight metal alloys composites
		OASIS	Open Access Single entry point for scale-up of Innovative Smart lightweight composite materials and components
DT-NMBP-02-2018	Open Innovation Test Beds for Safety Testing of Medical Technologies for Health (IA)	MDOT	Medical Device Obligations Taskforce
		Safe-N-Medtech	Safety testing in the life cycle of nanotechnology- enabled medical technologies for health
		TBMED	A testing bed for the development of high-risk medical devices
DT-NMBP-03-2019	Open Innovation Test Beds for nano-enabled surfaces and membranes (IA)	FlexFunction2Sustain	Innovation for nano-functionalised flexible plastic surfaces
		INNOMEM	Open Innovation Test Bed for nano-enabled Membranes
		NewSkin	Innovation Eco-system to Accelerate the Industrial Uptake of Advanced Surface Nano-Technologies
		NextGenMicrofluidics	Next generation test bed for upscaling of microfluidic devices based on nano-enabled surfaces and membranes
DT-NMBP-04-2020	Open Innovation Test Beds for nano-enabled bio-based materials (IA)	BIOMAC	European Sustainable BIObased nanoMAterials Community
		BIOMAT	An Open Innovation Test Bed for Nano-Enabled Bio-Based PUR Foams and Composites
		BIONANOPOLYS	Open Innovation Test Bed For Developing Safe Nano-Enabled Bio-Based Materials And Polymer Bionanocomposites For Multifunctional And New Advanced Applications
		INN-PRESSME	open INNnovation ecosystem for sustainable Plant-based nano-enabled biomateRials deploymEnt for packaging, tranSPort and conSuMEr goods

DT-NMBP-05-2020	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
		METABUILDING 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
		MEZeroE	Measuring Envelope products and systems contributing to next generation of healthy nearly Zero Energy Buildings
DT-NMBP-06-2020	Open Innovation Test Beds for nano-pharmaceuticals production (IA)	Phoenix	Pharmaceutical Open Innovation Test Bed for Enabling Nano-pharmaceutical Innovative Products
DT-NMBP-07-2018	Open Innovation Test Beds for Characterisation (IA)	FormPlanet	Sheet metal forming testing hub
		i-TRIBOMAT	Intelligent Open Test Bed for Materials Tribological Characterisation Services
		TEESMAT	Open Innovation Test Bed For Electrochemical Energy Storage Materials
DT-NMBP-11-2020	Open Innovation Platform for Materials Modelling (RIA)	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
		OpenModel	Integrated Open Access Materials Modelling Innovation Platform for Europe
		VIPCOAT	Virtual Open Innovation Platform for Active Protective Coatings Guided by Modelling and Optimization