H2020-NMBP-HUBS-2019

FlexFunction2Sustain

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

Starting date of the project: 01/04/2020
Duration: 48 months

= Deliverable D8.1 =

Report from interconnection with regional, national and EU level intermediaries and standardisation bodies

Dissemination level		
PU	**Public**	**x**
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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Executive Summary

The objective of the deliverable 8.1 is twofold:

- to consolidate interconnections with regional, national and EU intermediaries. These intermediaries include thematic scientific and industry associations on regional, national and EU level and economic development agencies.
- to ensure the alignment of FF2S with existing European and international standards (CEN, ISO).

Exploiting their pre-existing relationships, the partners have identified **33 relevant public bodies, organisations and association (OE-A, EMMC, EPPN, Nanosafety Cluster…)** to ensure efficient communication and outreach towards the scientific, economic and **standardisation community (AFNOR, UNE and different technical groups**). A mapping of targeted stakeholders was realized to plan future networking activities based on the project future needs. Priorisation were made over 10 organisations of importance that have been contacted to start discussing subject such as certification, clustering, dissemination or extension of service portfolio. Priorisation over 10 other organisations where made for next year activity.

The identification of internal capacity to contribute to the standards activity was realized to implicate the consortium members capable of implementing pragmatic actions. This list of partners and capabilities leads to the identification of **6 standard projects** that are followed and where the consortium planned to contribute. Partners such as IPC, OE-T, AUTH and FhG will be involved in the concrete and direct contribution to standards. The table below described the standards project that will be monitored and where contributions is foreseen.

Topic	Nomes ID		Title
Bioplastics	ISO/CD	22526-4	Plastics — Carbon and environmental footprint of bio-based plastics — Part 4: Environmental (total) footprint (Life Cycle Assessment)
Marine Biodegradability	ISO/CD	23832	Plastics — Test method for determination of degradation rate and disintegration degree of plastic materials exposed to marine environmental matrices under laboratory conditions
Marine Biodegradability	ISO/NP	5430	Plastics - Marine eco-toxicity testing scheme for biodegradable plastic materials - Test methods and requirements
Water Vapor Permeability Testing	ISO	15106/4-7	Plastics – Measurement of water vapour permeation rate below 10^{-3} g/(m²d)
Water Side-leakage testing printed electronic device layouts	IEC	TC119	Printed and Organic Electronics – measuring water side ingress through adhesives in typical device layouts
Organic Electronics	PWI	119-17 ED1	Future IEC 62899-2XX-X: Space charge mobility measurement in organic diodes

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1. Introduction

D8.1 deals with the interconnection of regional, national and EU level intermediaries and pre-normative contribution to standardisation bodies. It complements Tasks 8.2 that focus on the clustering activities among OITB.

It is built around two objectives that are:

- To map the most relevant stakeholder. Contact them and propose actions to develop the networking activities of the project. Create a dynamic network that will serve the other WP such the open call, the dissemination, etc.
- To drive the standardisation activities by identifying proper standard projects or published standards that need to be challenged. The partnership will then contribute to those specific standards.

2. Results and discussion

2.1. Interconnection of regional, national and EU level intermediaries

The objective of this subtask is to consolidate interconnections with regional, national and EU intermediaries. These intermediaries include thematic scientific and industry associations (e.g. OE-A, VDMA, etc.) on regional, national and EU level and economic development agencies.

A first, list of targets have been produced (see Table 1). This list represents potential targets that will be contacted or have been contacted for different proposes (open calls, wide dissemination, clustering activities…). The targets are given a priority (green: contact already established; yellow: initiate discussions immediately in the given priority order; white: no contact yet – initiate discussion upon good occasion or customer demand); A level of periodization has been set to organised the work of the coming month. The list will be continuously updated and complemented with new relevant associations and intermediaries.

Company Name	Company type	Purpose of the contact / Role of the stakeholder	Contacted
Acreo/Rise	SME	RTO in Sweden will be contacted as our link to Sweden	Priority 2
OE-A	Association/Cluster	**Network related to flexible electronics**, FlexFunction2Sustain Coordinator is Spokesperson of the OE-A working group "Encapsulation".	Yes
NIA - Nanotechnology Industries Association	Association/Cluster	Link with industry on nanotechnologies. EAB Member.	yes
EMMC -European Materials Modelling Council	Association	**EMCC Representing Characterisation activities/initiatives** Facilitate cooperation across Europe with other projects Pilot Lines; to enhance user involvement; and to ensure the accessibility and reusability of data	yes
European Chemical Council (cefic.org)	Association	Association of Chemical Industry in Europe	no
Réseau Europe en Région Auvergne	Public body / Authority	Regional Government Authorities to promote regional <=> transnational interactions	no
Auvergne Rhone Alpes Region	Public body / Authority	Regional Government Authorities to promote regional <=> transnational interactions	no
Normandie Regions	Public body / Authority	Regional Government Authorities to promote regional <=> transnational interactions	no
Loire Region	Public body / Authority	Regional Government Authorities to promote regional <=> transnational interactions	no
PlasticRecyclersEurope	Association	Association of Plastic Recyclers: Provide official protocols for testing the recyclability of products. Wide dissemination.	Priority 1
European Plastics Converter EUPC	Association	Association of Plastic Converters. EAB Member	yes
Food Drink Europe	Association	Association of Food and Drink companies. Pool of potential customers of the OITB	no
EUROPEN	Association	The European Organization for Packaging and the Environment. Pool of potential customers of the OITB	Priority 5
CEFLEX	Cluster	Cluster of companies representing the entire value chain of flexible packaging	Priority 4
Nanosafety Cluster	Cluster	**Cluster on the safety of nanotechnology** Facilitate cooperation across Europe with other projects Pilot Lines; to enhance user involvement; and to ensure the accessibility and reusability of data Regular meetings to discuss the possibly of extending the FlexFunction2Sustain service portfolio and further integrate nano-safety related services	yes
AFELIM	Cluster	AFELIM brings together the various contributors of the printed electronics sector in France. National network related to flexible electronics	no
POLYMERIS / Plastipolis	Cluster	French competitive cluster for plastics and composites	no
JIIIP - JOINT INSTITUTE FOR INNOVATION POLICIES	Association	JIIP provides intelligence to support policy-making, with a focus on research and innovation policy.	no
European Factories of the Future Research Association - EFFRA	Association	Made in Europe roadmap, Industry 4,0 factory of the future. The European Factories of the Future Research Association (EFFRA) is a non-for-profit, industry-driven association promoting the development of new and innovative production technologies	Priority 6

SUSCHEM	Association	SusChem is the European Technology Platform for Sustainable Chemistry. It is a forum that brings together industry, academia, policy makers and the wider society.	Priority 10
European composites, plastics and polymer processing platform - ECP4	Association	Industry-driven collaboration that unites members from 13 countries amongst the top-level European research institutions, regional plastic clusters, and EU-level industrial organisations of plastics and composites converters.	Priority 8
Circular Plastic Alliance	Initiative	CPA gathers 245 public and private actors covering the whole plastics value chains	Priority 3
CEFIC (European Chemical industry Council)	Association	Dissemination	no
EPPN (European Network for Pilot Production Facilities and Innovation Hubs)	Association	**Dissemination**, links with other pilot production facilities and OITBs	yes
EUROPEAN POWDER METALLURGY ASSOCIATION (EPMA)	Association	To promote and develop Powder Metallurgy (PM) technology in Europe	no
TECHTERA	Cluster	French competitive cluster for textile	no
Alliance Électronique - ACSIEL	Trade union	Trade union bringing together all players in the electronics value chain	no
4M association	Association	Network of Excellence to develop Micro- and Nano- Technology (MNT) for the batch-manufacture of micro-components and devices in a variety of materials for future microsystems products.	no
European Composites Industry Association - EUCIA	Cluster	European Composites Industry Association (EuCIA) represents European national composite associations as well as industry-specific sector groups at EU level.	no
Austrian Standards	Association	Standards Development	no
UNE (Spanish standardisation authority)	Association	**Standards Development.** Engage on an early-stage discussion on OITB standardisation activities harmonisation (INNPRESSME + OASIS)	yes
Cecimo (European Machine Tool Industries and related Manufacturing Technologies)	Association	Secretary General/Director General	no
AIMCAL (https://www.aimcal.org/)	Association	Publisher of AIMCAL Magazine, Association for Matallizers and Coaters on Plastic web (worldwide, but with growing European Community	Priority 7
LINPRA		Lithuanian, Estonian and Latvian Engineering Association. EAB Member	yes
Environmental Investment Partners	Venture Capitalists	Investor for environmentally friendly projects and companies. EAB Member	yes
M27 GmbH	commercial company	Investor to SME relations broker and Platform	Priority 9
TÜV Austria	Certification Agency	Issues certificates for accredited test labs for biodegradability testing as well as acts as certification agency subcontracting accredited test labs for test measurements. They have been contact for for facility certification	yes

Table 1: First list of targeted stakeholders for networking

2.2. Pre-normative contribution to standardization bodies

In the frame of Task 8.1, FF2S partners will contribute to standardisation developments in specific topics relayed to the project research. The purpose is to increase the project exploitation and impact by promoting the inclusion of the project outcomes in new or future standards or in already existing standards that can be easily used by the European or international industry.

The specific strategy followed by the partnership is fourfold:

1. Identify among the partners whom have the capability to directly contribute to standards activities.
2. Identify the standards project about to be published and contribute to it
3. Identify the standards project that are considered as problematic and are potentially targeted for revision.
4. Homogenisation of standards activities with the others OITB

2.2.1. Identification of normative capacity within the consortium

Definition: a partner having the capacity to contribute to standardisation activity is a partner that is either the national standardisation authority, is a sectorial standardisation authority (by delegation) or is an active member of a standardisation technical committee.

Partners having the capability to contribute directly to the standardisation activities through standardisation bodies are:

Standards topic covered	Partners	Means of contribution / link to Authorities	Link
Plastics and composite	IPC	Directly to the French national standardisation body (AFNAOR). IPC is the French sectorial bureau of standardisation on plastics and composite	*https://ct-ipc.com/page/bnpp*
Organic Electronics/Organic Photovoltaics	OE-T	Through a membership at the IEC	tbc
Printed flexible electronics	AUTH	Through a membership at the IEC (technical comity - TC 119)	*https://www.iec.ch/dyn/www/f?p=103:7:::::FSP_ORG_ID:8679*
Encapsulation technology and water vapour permeability testing	FhG	Through Fraunhofer ENAS to the standards in the IEC-TC119 and TC124 for flexible and wearable electronics, further access to the ISO TC61 working group 7	*https://www.enas.fraunhofer.de/en/about_us/cooperations_1/fraunhofer-project-center.html*

2.2.2. Identification to standard projects and contributions

Description of the Methodology though the example of IPC:
IPC as the French sectorial standardisation bureau on plastics and composite, represent the French standardisation authority in this specific field. Hence, IPC belongs to several French expert commission dealing with plastics. The expert Scientific Committee (SC) explore standards issues belonging to the thematic below:

- bioplastic
- recycling of plastics
- micro-plastic and Nano plastics
- composting
- composting in marine environment
- LCA in the bioplastic value chain

A normative watch is permanently realized by IPC within those SC to list the principal and latest standards edited every year. Those SC corresponds to the **Working Group (WG) ISO-TC-61-SC14**. TC 61 standing for the Technical Committee dealing with plastics standards, and SC14, the sub-committee dealing with environmental aspect of plastics. In addition, this WG explore the topics described below:

1- Terminology discussion
2- Biodegradable plastics
3- Bio-sourced plastics
4- Micro and nano-plastics
5- Chemical, mechanical and physical Recycling of plastics

In a nutshell, through the implication in specific national technical committee, **IPC have access to all normative projects dealing with plastics and composites that are presented to the ISO, the CEN or the NF (French standards).**

In addition, other partners that are members of technical committee, will have the same capability to detect and contribute to any standards project conceived within their committee.

A second normative watch is permanently realized through the FHG activities within the OE-A Working Group Encapsulation. This includes both water vapour permeability measurements on plastic webs and packaging products and testing of encapsulation performance in flexible organic electronics devices.

The Table 2 below describes the list of normative projects identified and in which the partners planned to contribute.

Topic	Nomes ID		Title	Subject	Lead Partner
Bioplastics	ISO/CD	22526-4	Plastics — Carbon and environmental footprint of bio-based plastics — Part 4: Environmental (total) footprint (Life Cycle Assessment)	This document provides guidance and requirements to assess impact over the life cycle of bio-based plastics products. The applications of LCA as such are outside the scope of this document.	IPC
Marine Biodegradability	ISO/CD	23832	Plastics — Test method for determination of degradation rate and disintegration degree of plastic materials exposed to marine environmental matrices under laboratory conditions	This document specifies test methods for the measurement of the physical degradation of samples made with plastics materials when exposed to marine environmental matrices under aerobic conditions at laboratory scale. Plastics samples can be exposed to three different test conditions and different marine matrices: buried into a wet sandy marine sediment; at the interface between a marine sandy sediment and the water column; to seawater. The conditions applied in these test methods are designed to determine the degradation rates of plastics materials and give an indication of their propensity to physical degradation and disintegration in natural environments. Degradation rates considered in this document are mass loss rate, erosion rate, and mechanical properties loss. Disintegration, i.e. physical breakdown of a sample into very small fragments (<2mm) can also be assessed. The test design (i.e. the total number of tested samples, the number of replicates and of repeated measurements) of the test methods is flexible. The complexity of test design and the cost of testing can be modulated according to the requests and purposes of the client. For example, tests planned for results delivered under statistically optimal conditions can be arranged for certification purposes, while simpler tests can be arranged for screening purposes. This document is not suitable for the assessment of degradation caused by heat (thermo-degradation) or light exposure (photo-degradation).	IPC
Marine Biodegradability	ISO/NP	5430	Plastics - Marine eco-toxicity testing scheme for biodegradable plastic materials - Test methods and requirements	This document specifies test methods and evaluation criteria by addressing potential eco-toxicological adverse effects on marine organisms. Adverse effects on marine species may be caused by plastic materials and degradation products resulting from the decomposition of biodegradable plastic materials that are intentionally or unintentionally disposed to marine environment. The eco-toxicity testing scheme covers marine organisms from three trophic levels: - toxicity to marine microorganisms - toxicity to marine algae - toxicity to marine invertebrate. Toxicity to marine fish is not considered due to animal welfare considerations. This document is not suitable for the assessment of adverse effects caused by solid, non-biodegradable plastic materials such as microplastics.	IPC
Water Vapor Permeability Testing	ISO	15106/4-7	Plastics – Measurement of water vapour permeation rate below 10^{-3} g/(m²d)	These standards address the measurement of water vapour permeability in a range below 10^{-3} g/(m²d) using direct pressure measurement, calcium mirror test and mass spectrometry. In that regime called “ultra-high permeation barriers”, time-dependent effects significantly influence the measurement results leading to non-comparable results. However, these time-dependent effects are not sufficiently respected in the corresponding ISO documents. The OE-A working group Encapsulation aims at proposing a revision to these standards that better reflect the time-	FHG, AUTH

				dependent behaviour of the materials. The activities are brought to the standardisation bodies through the UK National Physical Laboratory (NPL).	
Water Side-leakage testing printed electronic device layouts	IEC	TC119	Printed and Organic Electronics – measuring water side ingress through adhesives in typical device layouts	The OE-A Working Group encapsulation currently undergoes experimental investigations on best suited device setups to measure the side ingress of corrosive gases to typical printed electronics device layouts. Currently no standard exist, which allow the comparison of different adhesives and adhesive/substrate combinations with respect to the amount of water penetrating through the side to an organic electronic device. Through the fact that this "side-ingress" is determined both by the bulk permeation through the adhesive material itself and the diffusion along the substrate/adhesive interface – creation of a reference test layout is challenging. The standardisation project is currently still in a pre-normative experimental evaluation phase. The interaction to the standardisation body TC119 is secured through FHG.	FHG, AUTH
Organic Electronics	PWI	119-17 ED1	Future IEC 62899-2XX-X: Space charge mobility measurement in organic diodes	https://www.iec.ch/dyn/www/f?p=103:38:24553919859845::::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:8679,23,103722	OET/AUTH

Table 2: Preliminary list of targeted standard projects open for partners contributions

2.2.3. Identification of standards to be reopen

The Standards ISO 15106 section 4 to 7 are currently being under investigation within the OE-A working group encapsulation and suggestions for revising standards are in preparation.

2.2.4. Homogenization of standards activities with the others OITB

In relation to Task 8.2 on inter-clustering activities, the FF2S project plan to team up with a specific project to start discussing homogenization of standardization activities among OITBs.

The INPRESSME OITB project lead by VTT and dealing with a similar technical subject propose standardization tasks lead by UNE. Those tasks have a similar purpose as our task 8.1 and ultimately will propose a guide to harmonized good practice in OITB standardization activities.

A first contact with UNE, the Spanish national standardization authority, was established. Discussions about **the guide will start at the end of the year to align on a common goal.**

3. Conclusions and next steps

On the interconnection aspects

Conclusion: Within the first year of the project, preparatory work was realized to list targeted audiences/stakeholders. At this stage of the project development, the main achievements are still in maturation. The SEP structure, the description of the facility clusters, the service catalogue are still in preparation. For this reason, it was considered premature to engage with the targeted stakeholders on a broad spectrum. Few connections were then established so far.

Next steps:

- Follow the development of the project and ensure that needs of networking from others WP are met, especially open call.

On the standardisation aspect

Conclusion: Organisation of work was realized by identifying internal capability. Detection of standard projects were realized and four standard projects of interest were flagged. Those standard projects will be followed during the next years and contributions will be realized.

Contact outside the consortium were realized with other national standardisation authorities (UNE) to discuss harmonisation procedure among OITB.

Next steps:

- Keep tracking the development of identified standards project together with AUTH, OE-T and IPC and contribute to it.
- Resume the discussion with UNE on the standardisation harmonisation guide in OITB.
- Look for “problematic” published standards that need to be reopen.

4. Degree of progress

Deliverable 8.1 is fulfilled by 100%.

5. Dissemination level

The deliverable is completely public. It does not contain confidential material.

The content of the normative activities is confidential. Only the title of the normative project are described and are available on internet.