

FlexFunction2Sustain

Project overview & status

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M43 meeting, Braga, 17-18 Oct 2023



This project has received funding from the European Union's Horizon 2020 research and innovation programme under [grant agreement n°862156](#)

A photograph of a beach heavily littered with plastic waste, including numerous discarded plastic bottles, fragments of plastic, and other debris. The waste is scattered across the sand, extending from the foreground towards the water's edge. The water is visible on the right side of the frame.

FlexFunction2Sustain boosts innovation for sustainable and smart plastic and paper products

➔ to reduce plastic waste

➔ get ready for the digital age

using

nano-functionalization of novel plastic and paper surfaces

- FlexFunction2Sustain project aims at creating an **Open Innovation Test Bed (OITB)** for nano-functionalisation technologies that enable sustainable and smart plastics and paper based products. The ecosystem will support innovative SMEs and industries by drastically reducing the time-to-market for novel concepts, ideas and products.
- Open Call for Pilot Cases
 - Objective: Test Services and Procedures and **Create Success Stories**
 - What you get: Discounted services **up to 100% subsidized support**
 - Available budget: **2.25 M€ for approx. 20 projects**

KET
Market

Target markets



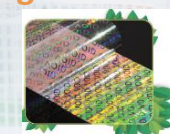
sustainable
smart
packaging



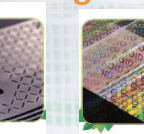
surfaces &
membranes in
bio application



plastic &
paper
electronics



optical films
for security
& design



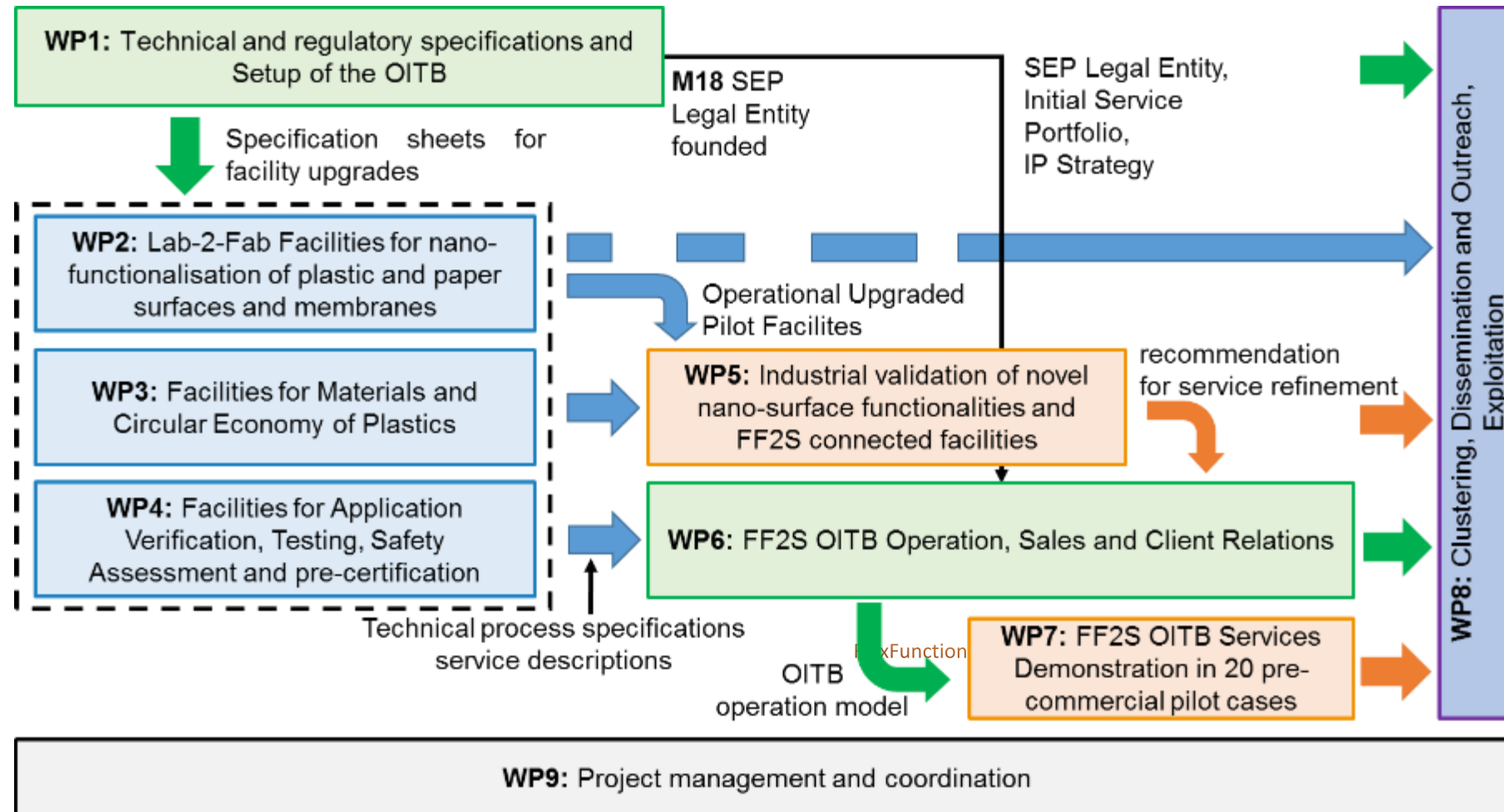
plastic films
for architecture
applications



smart plastics
in automotive
application



Our work plan towards a sustainable Open Innovation Ecosystem ...



M36 Review feedback



- **EC Official review with HADEA Project Adviser and external expert** hold on 07 June
- Overall positive assessment of FF2S progress; we were acknowledged for:
 - *Good cooperation among the partners*
 - *Achieving most of the objectives with minor deviations*
 - *Successfully managing the delays stemming from COVID and the SEP-related issues*
 - *Ability to overcome the risks*
 - *High quality deliverables*
- Some (minor) recommendations concerning future work (*to be reflected in the Final Report*)

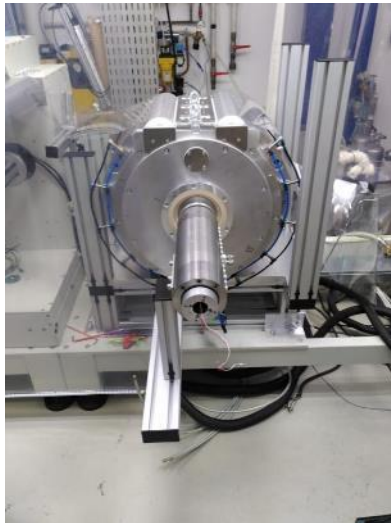
Achievements M37 – M42



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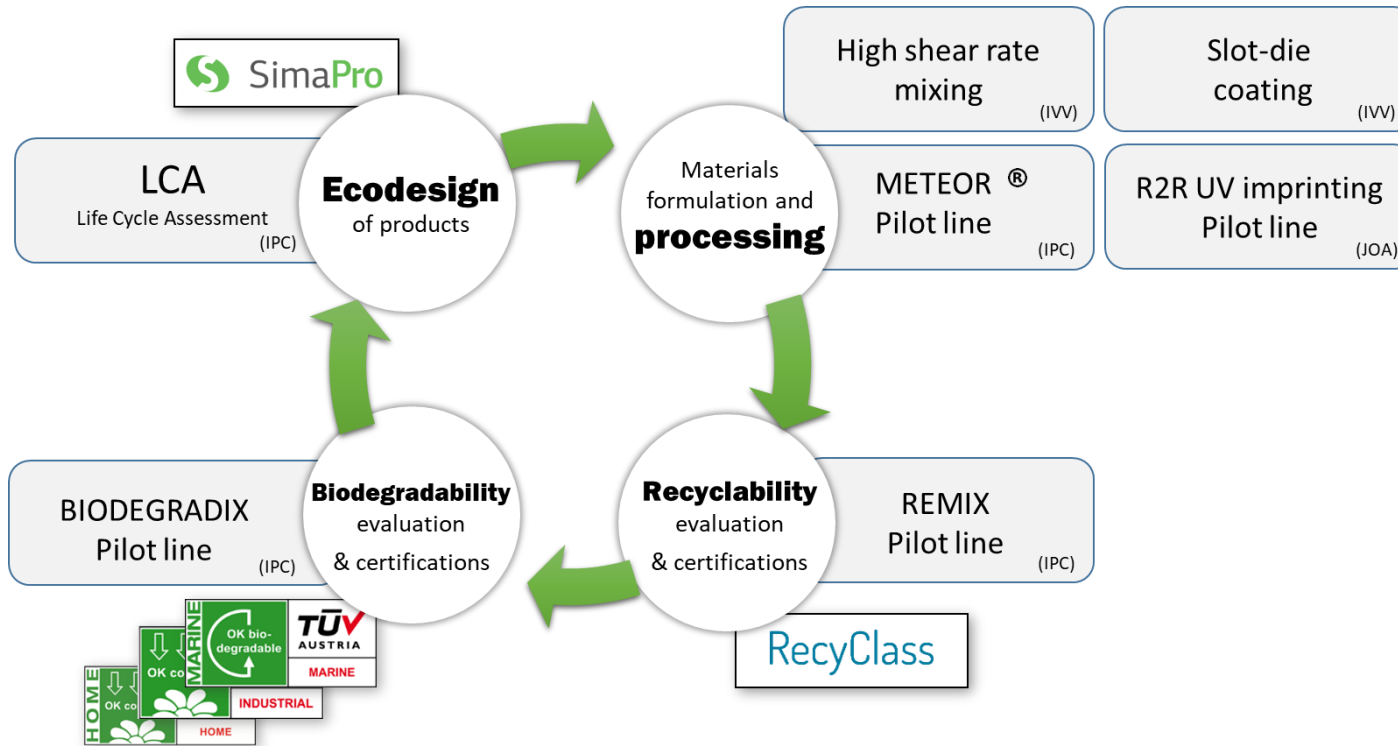
WP2 – M37 – M42 achievements

- Installation of Spatial ALD unit by Coatema at Fraunhofer-IVV
 - Gas connections to rotary union installed by FhG-IVV
 - Awaiting completion with valves, new motor and controls
- Finalisation of installation for R2R Spray coating tool at INL
 - R2R Spray Coating system installed. Currently validating the transfer of coating processing conditions from the benchtop equipment to the R2R pilot system.



WP3 – M37 – M42 achievements

- All upgraded facilities were confirmed and delivered!



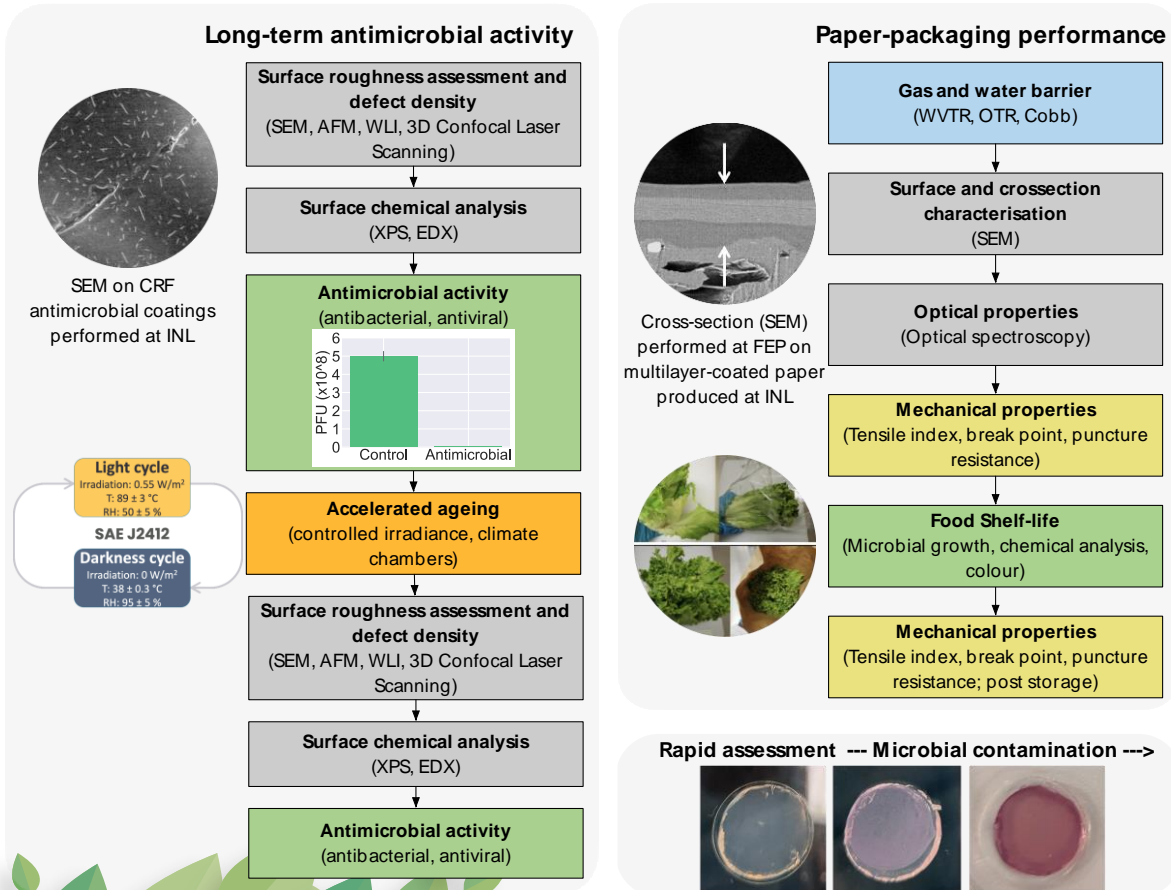
- Final upgrade of the REMIX Pilot line

- Installation of a **turbosorter** on the optical sorting machine, to further improve the sorting of flexible products

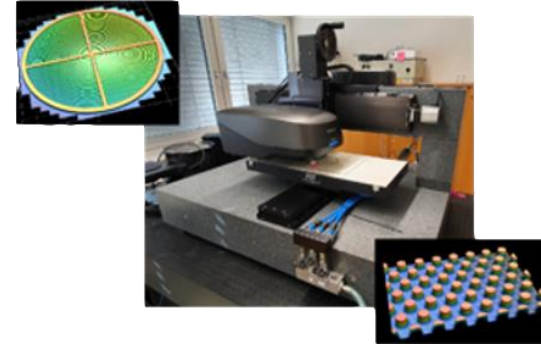


WP4 achievements

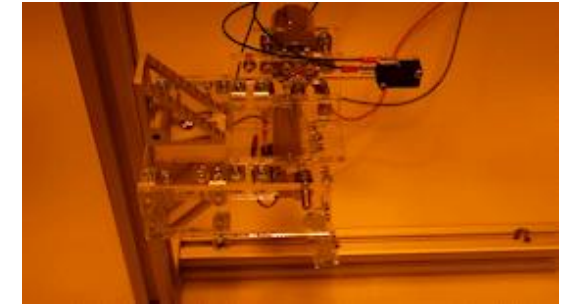
New testing methodologies and workflows to assess the performance, safety, and compliance of novel nano-functionalised materials and to support the offer of **consulting services** on “Circularity by Design” for **developing novel sustainable solutions**.



Novel specialized characterisation services



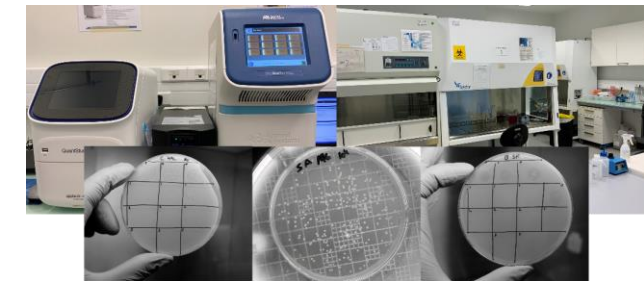
Large area (300 x 600 mm²) surface profiling by 3D Confocal Laser Scanning Microscopy @ JOA



Combined optical calcium test for WVTR + mechanical bending test in device geometry @ FHG-IAP



- Catalogues of services for:
- Physicochemical characterisation
 - Performance verification
 - Safety and regulatory compliance



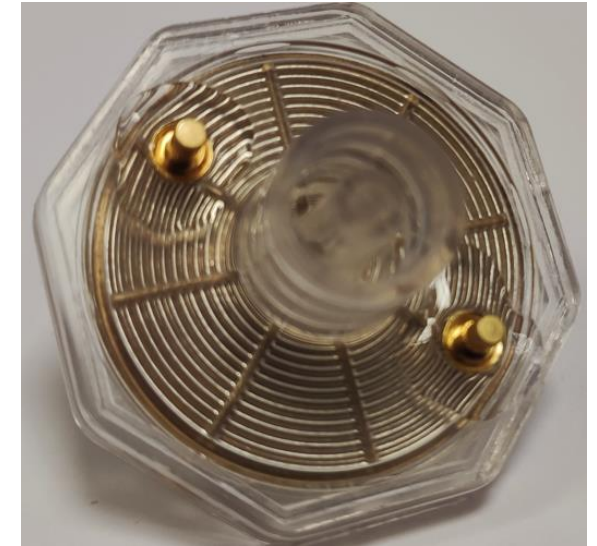
Upgraded Microbiology Laboratories for antimicrobial surfaces @AUTH and @INL



FLEX FUNCTION 2
SUSTAIN

[illegible]

FF2S innovation: barrier and coating process



FF2S innovation: Au recovery (99,6%)

WP5 Final demonstrators



Task 5.4: Dashboard component demonstrator with touch functionality
FF2S innovation: anti-scratch and anti-reflective features achieved

Task 5.6: from the PET/Alu/PE multimaterial to the FF2S mono-PP pouch - Fully recyclable mono-materials drink pouches

FF2S innovation: positive results from sorting and recycling trials



Task 5.5: Paper based fresh food packaging


















FF2S innovation: bio-based barrier coating on transparent paper

WP6 – M37 – M42 achievements

- SEP selected (KET Market)
- Ecoystem management platform will be set up by KET Market
- Participation at two conferences highlighting investment opportunities are planned.
- Surveys have been carried out to identify needs for business development and consulting.
- Patent landscape survey has been done – and is ongoing for use-cases

WP7 achievements

Open Call for Pilot Case projects

Proposal number	Acronym	Proposal full name	Company name	Country
1st cut-off : 4 Cases selected				
20220125-0011	IDOLES	Improvement of durability by optimizing Low Energy Surface	Infrascreen	
20220126-0017	FunFlex	Surface functionalization of Circular flexible food packaging	LEYGATECH	
20220131-0018	SustainPack	Sustainable Packaging	HPX Polymers	
20220128-0016	DCC	Dispersion Coating Compostable	Cartiera Rivignano	
2nd cut-off : 5 Cases selected				
20220728-0027	ENLIGHTEN-MENT	Functionalisation of agricultural films with multi-season fluorescent dye to enhanced plant developm	CASCADE	
20220809-0032	POSIDONIA	Hydrophobic & UV-protective films for Sustainable panels based on natural waste fillers and bio-base	PHEE PRIVATE COMPANY	
20220725-0022	POSEIDON	Pouch made of cellulose for liquid container applications	ARJOWIGGINS	
20220805-0030	BIOESS	Barrier Improved Ovtene for Environmentally Sustainable Strategies	ARCADIA SPA	
20220812-0033	RECYBIB	Fully Recyclable Monomaterial Bag-in-Box	Smurfit Kappa Bag-in-Box	
3rd cut-off : 8 Cases selected				
20221221-0037	AMB2022-004	AMB barrier film for thermoforming application	AMB Spa	
20230124-0043	LOOPTUBE	Lamination of high barrier properties coated PE films on PE films for cosmetic tubing application	Albea Services SAS	
20230124-0036	BB-BROF	Biobased high refractive optical film	Bruno Bock GmbH	
20230202-0046	BAGS4RETORT	Mono-material plastic retort pouches	SDR PACK	
20230203-0047	AGRILOOP	Recyclability of PE/EVOH and PE/PA agricultural films while keeping high gas barrier and mechanical	Groupe Barbier	
20230124-0041	TORAYFAN+	OPP mono-material structure for food packaging	Toray Films Europe	
20230203-0040	RESTO	REcycling & Sorting of plastics with Timegated Optical technology	SINBIOSYS SRL	
20230203-0052	P.L.	PETLoop	TRANSPARENT PAPER	

*Cut-off 1:
2 pilot cases already
finished with successful
results*

*Cut-off 2:
ongoing work in time*

*Cut-off 3:
Most cases starts,
last JIA to finalize*



Geographical representation of applicants in FF2S Open call for Pilot Cases

WP8: M37 – M42 achievements



Visual Identity and Dissemination of the Project and OITB Idea

- Visibility at events e.g., ENF2023, NANOTEXNOLOGY 2023
- FF2S in Press and Media announcing the project outcomes
- Webpage and social media regularly updated
- Open Access Scientific publications published

Clustering with other OITBs & NanoSafetyCluster

- Regular bilateral exchange: NGM, SNMT, NewSkin, MDOT
- 3rd OITB annual workshop on 14 Jun, Lund, Sweden
- Workshop Sustainable Nanofunctionalized Materials on 28 June in Prague, Czech Republic, co-organized with Convert2Green OITB

Interaction with thematic associations and intermediaries

- OE-A Working Group Encapsulation
- EUPC, LINPRA, NanoSafetyCluster → EAB Members

FlexFunction2Sustain Open Call promotion

- Marketing activities for disseminating the Cases selected via Open Calls

OITB Association promotion

- Social Media presence & presentation at events
- Creation of branding for the OITB association (ESNA)
- Website & Promotional materials prepared

EuroNanoForum (ENF2023)
11-13 June, Lund, Sweden



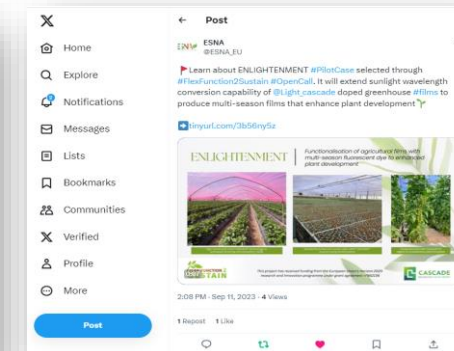
3rd OITB Workshop
14 June, Lund, Sweden



Scientific publications



Promotion of Pilot Cases



Branding the
OITB Association



FF2S M43 meeting



17-18 Oct 2023

Focus topics for next months

- Flexfunction2Sustain funded project is coming to the end
- Pilot cases must be completed to the satisfaction of our customers
- Dissemination of outcome of use and pilot cases
- Final Events (Public event and Review meeting) to be settled
- Focus on a successful transition to a sustainable OITB business by ESNA (together with the SEP)



Thank you
for your attention!

