Innovation Eco-system to Accelerate the Industrial Uptake of Advanced Surface Nano-Technologies.

Reporting

Project Information

NewSkin

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Project website

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10.3030/862100

Project closed

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8 April 2020

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1 April 2020

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INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Advanced materials

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CONVENTION EUROPEENNE DE LA CONSTRUCTION METALLIQUE ASBL
Belgium

Periodic Reporting for period 2 - NewSkin (Innovation Eco-system to Accelerate the Industrial Uptake of Advanced Surface Nano-Technologies.)

Reporting period: 2021-10-01 to 2023-03-31

Summary of the context and overall objectives of the project

Key Enabling Technologies (KET´s) deployment will be the driving force for a significant part of the goods and services that will be available in the market in the next decade. Amongst KET´s, nano-enabled surfaces and membranes must be highlighted due to their huge potential to offer material solutions to address Sustainable Development Goals resulting in positive and sound impacts for the society and key industrial sectors.

The NewSkin Solution aims to create an Open Innovation Test Bed (OITB) to provide the Innovation Ecosystem (IE) with the necessary technologies, resources and services to uptake a set of game changing, efficient and cost-effective innovative processes to manufacture nano-enabled industrial and consumer products as well as the necessary testing capabilities to demonstrate nano-enhanced goods features.

The NewSkin innovative manufacturing up-scaling and testing facilities bring within the reach of the I.E the necessary tools to create and validate to TRL7 new market opportunities. For example, the complete set of processes for the manufacturing of graphene nano-enabled membranes (from continuous graphene production to nano-pore creation and functionalization as well as testing facilities) or roll to roll (R2R) and Texturing During Molding (TDM) nano-textures mass production processes (Accurate laser texturing, HiPIMS batch process and sol-gel application pilot plant on complex geometries and validation and testing pilot plants). In addition, NewSkin Consortium will also provide the I.E route to market services during the final commercialization stage. Some examples of the NewSkin products are:

a) Nano-enhanced liquid and powder coatings:
b) Nano-enabled water membranes:
c) Industrial components:
d) Functional ceramics:
e) Nano-enabled foils, envelops, films and packaging:

NewSkin Overall Objectives are:

Overall Objective 1: Setup and organization of a sustainable OITB and I.E Engagement:

Overall Objective 2: Upgrade 10 Pilot Plants for prototype manufacturing and industrial processes definition equipping in-line quality control:

Overall Objective 3; Upgrade of 9 test sites to evaluate the performance of nano-enabled products in operational environments:

Overall Objective 4: Validation of the OITB value proposition and services provision. TRL4 to TRL7 in

3-12 Months:

Overall Objective 5: Performance Targets:

- Over 25 years surface protection for materials
- Up to x 10 permeability water membranes.
- 50% friction losses and over 200% increased life span in moving parts .
- 30% increased fuel efficiency on marine transport.
- Advanced functionalities: antimicrobial, self-cleaning, super-oleo-hydrophobicity, bio-compatibility, anti-reflective and optical filters, Sensing, smart & integrated electronics, electro-chromic finishes.

Overall Objective 6: Knowledge generation

- Generation and Dissemination of models, data and testing procedures:
- Establishing dialog with standardisation bodies.

Work performed from the beginning of the project to the end of the period covered by the report and main results achieved so far

By the end of the 1sT Reporting Period all Work Packages but Work Package 6 are running.
During the First Reporting Period the Consortium has concentrated efforts in the definition of the Open Innovation Test Bed Single Entry Point and Collaborative Framework including the roles and the Structure.
WP2 and WP3 has been almost completed despite the negative effects the COVID-19 had on the project execution which consequences will mainly affect the WP4 (active by the end of 1st Reporting Period) and WP5 (starting at the close of the 1st Reporting Period) execution.

By Month 18 most the upgrades on upscaling facilities have been accomplished and Testing facilities have been upgraded on time or incurring in moderate delays.

The deviations on WP2 and WP3 are expected to be absorbed during WP4 and WP5 implementation. For the Worst-Case Scenario an extension for the project will be asked in the case that the “force majeure” scenario we have been working since the project start elapses

The calibration and validation of the different facilities has started and the NewSkin value proposition has been produced to launch the Open Calls and the Case Studies.

The WP7 two first tasks; Open Calls Preparation and Online platform has been accomplished successfully. The platform is operative to act as communication platform, host the Open Calls, the repository, provide access to the OITB Services and Value Proposition and host the NewSkin Innovation Ecosystem Directory. The first Open Call was launched in October.

Through Dissemination and Communication and Innovation Ecosystem Engagement activities, Newskin is gaining traction and attracting the interest of an heterrogenous range of entities from Academia to Industry,

WP8 included the “Technology Development, Innovation Management and Exploitation Roadmap” that will guide and articulate the Exploitation Strategy as well as being the reference for the elaboration of unique selling point and the creation of ad-hoc value propositions to ensure the continuity of the NewSkin Open Innovation Test Bed after the Grant Execution.

Progress beyond the state of the art and expected potential impact (including the socio-economic impact and the wider societal implications of the project so far)

NewSkin project will bring into the reach of the I.E a novel set of upgraded up-scaling pilot and test faciliteis that will enable the TRL7 demonstration of the nano-enabled marketable products. These facilities will contribute to increase the TRL of a wide range of products from curent lab hand crafted processes (TRL4) to industrializable pilot plant processes manufactured prototyes which performance has been demonstrated in relevant environments (TRL7) in a 3 to 12 months period.
Technologies traditionally associated to batch processes with high costs and low to moderate productivity; CVD, PVD and laser will be available as continuous processes able ot produce polymeric or metallic foils coated with high Performance and functinal finishes for its deployment in large markets (electro-chromic glasses for windows, photo-catalytic and easy clean facades, nano-safe automatized coated components, steel and aluminium packaging with anti-microbial properties. mechanically textured molded components…). In addition two novel approaches for the mechanical nano-texturing of components will be available; TDM and R2R processes.

The technologies have been selected to synergistically interact at the nano-scale.

NewSkin testing facilities will allow to demonstrate the performance of the real scale prototypes in real environments and operation conditions not currently available.

NewSkin will contribute to mitigate the following impacts.

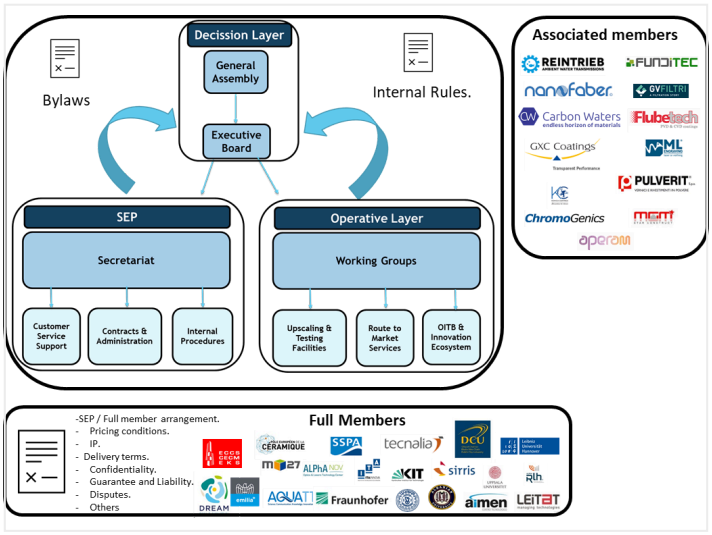
- Energy consumed in buildings transport and water treatment.

- Corrosion, friction and wear effects.

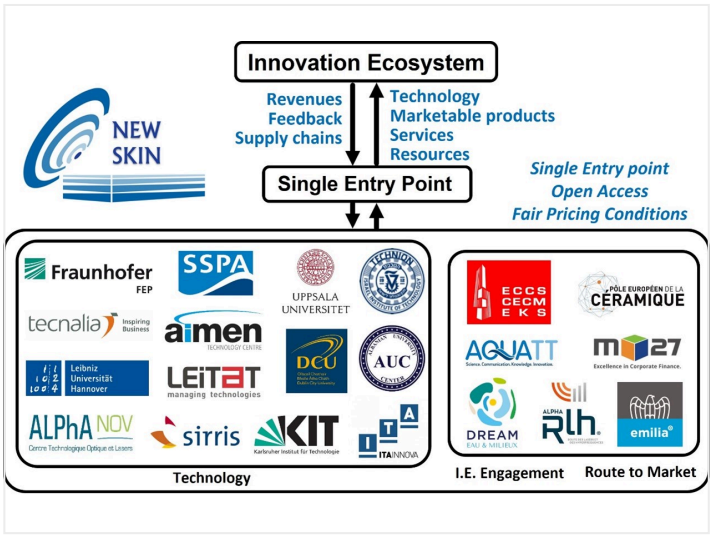
- Food and packaging waste

- Dependency on fossil fuels.

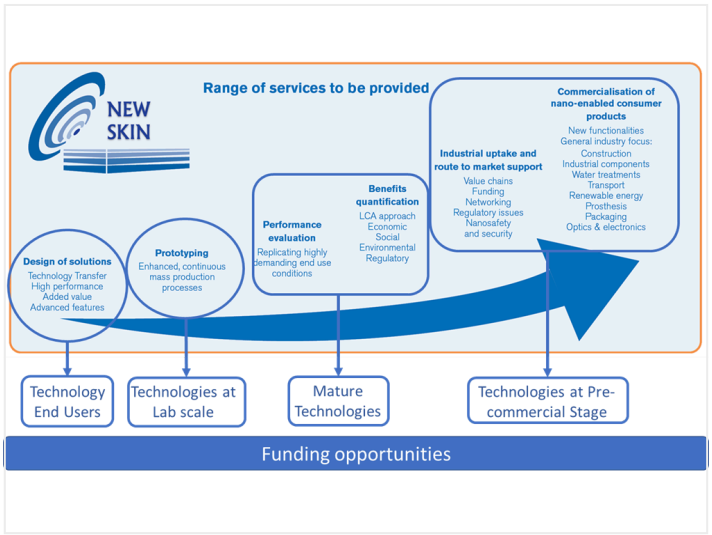
Summary of NewSkin Technological Value Propositions



NewSkin AISBL structure



NewSkin interaction with the Innovation Ecosystem



Summary of NewSkin available services according to technologies maturity

Last update: 3 September 2024

Permalink: https://cordis.europa.eu/project/id/862100/reporting