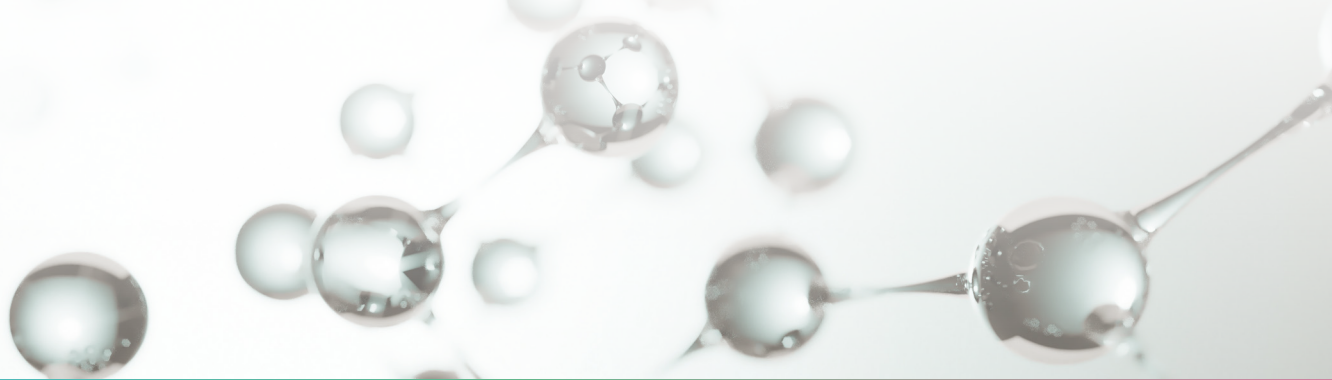




Enhanced Safe and Sustainable
coatings for supporting the Planet

NEWSLETTER

Issue 2, DECEMBER 2023



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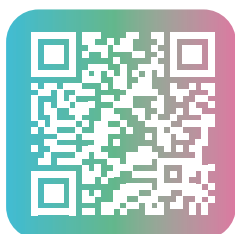
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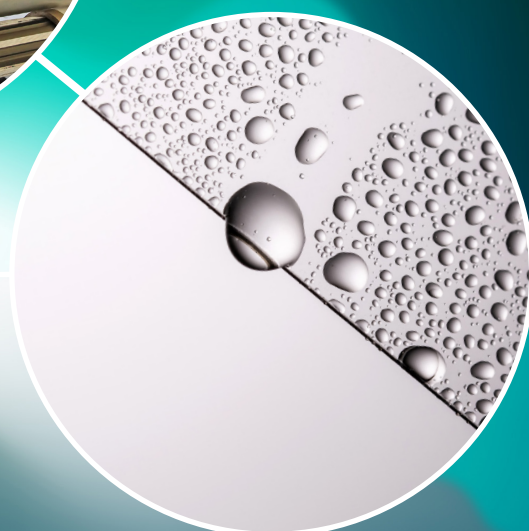
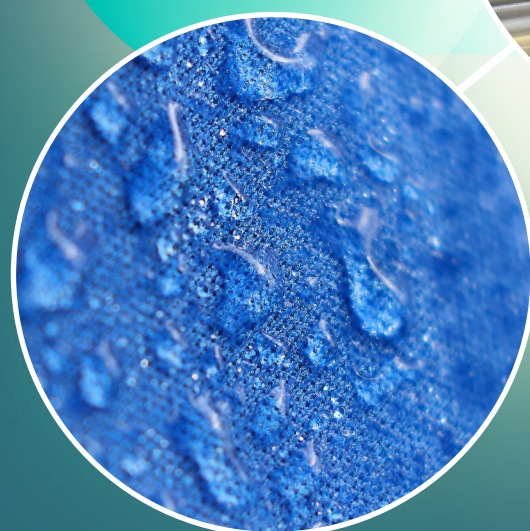
UNVEILING THE FUTURE OF SUSTAINABLE COATINGS: THE PROPLANET TECHNOLOGIES

In the dynamic landscape of sustainable innovation, the PROPLANET project promotes innovation for coatings development technologies. This collaborative effort targets three novel coatings formulations, designed for specific industrial applications and guided by the principles of Safety and Sustainability by Design (SSbD).

The first innovation focuses on the development of crosslinked biopolymer oil/wax microcapsules within a polysaccharide matrix, offering hydrophobicity, oleophobicity, and exceptional wear resistance. Notably, these coatings, led by NIC in manufacturing, validated by AITEX, and assessed for environmental impact by HOLOSS and NILU, in line with the project's sustainability commitment.

PROPLANET's second innovation introduces a hybrid siloxane bio-based coating, manufactured by TECNALIA. This solution presents non-stickiness, anti-corrosion properties, and robust resistance to thermal and mechanical stresses, aligning with the project's eco-friendly attributes. With REEPACK as the end-user, environmental and toxicity aspects are addressed by HOLOSS and NILU.

The final coating development is related to the Hybrid Siloxane Coating, expertly designed by TECNALIA to combat soiling and enhance reflectivity, meeting the needs of end-user Pilkington. The coating's anti-soiling and anti-reflective properties are complemented by thorough environmental and toxicity assessments by HOLOSS and NILU.



PIONEERING SAFE & SUSTAINABLE COATINGS: PROPLANET'S JOURNEY FROM TRL3 TO TRL5

PROPLANET project comes with a commitment for Safe and Sustainable by Design (SSbD), an approach endorsed by the OECD that seeks to deliver functions or services while minimizing environmental impact and mitigating potential harm to human health and to ecosystems. The project's scope extends across the entire value chain, ensuring circularity by particularly addressing various stages: from sourcing and conversion to pre-treatment, through enhanced production at an industrialisation system reaching TRL5, to end-user testing, and ultimately incorporating next-use activities, including end-of-life considerations such as recycling and reuse.

Aligning closely with the guidelines set by the European Commission for structuring sustainable-by-design and safety criteria, PROPLANET aims to not only contribute to the development of principles for safety and sustainability but also integrate circularity and advanced material functionality. The project sets an ambitious goal of maximizing alignment with other initiatives funded under the same topic, fostering collaboration and synergies within the research community. Importantly, PROPLANET's commitment to staying current involves continuous internal reviews, ensuring its strategies remain abreast of international developments, including guidelines from organisations such as OECD, ECHA, and UNEP.

In essence, PROPLANET emerges not just as a coating project but as a holistic attempt striving to reshape industrial processes, making them safer, more sustainable, and in harmony with global environmental initiatives. The journey from TRL3 to TRL5 signifies a maturation process where innovative ideas transform into practical solutions, promising a future where coatings not only protect but also contribute to a toxic-free environment.

COMPUTATIONAL TOOLS DRIVING SUSTAINABLE MATERIAL DESIGN IN PROPLANET

The utilisation of computational tools stands at the forefront of PROPLANET's commitment to Safe and Sustainable by Design (SSbD) of materials. Mathematical modeling, recognised for its efficacy in simulating and resolving real-world systems, is aimed to revolutionise toxicological analyses. PROPLANET seeks to advance the industry by promoting in vitro assessments coupled with environmental fate models. Embracing a paradigm shift, the project advocates for modeling and optimisation through the lens of design, leveraging artificial intelligence techniques. This initiative tackles existing challenges in modeling processes, such as data scarcity, unevaluated data, and the absence of standardized metadata.



INNOVATIONS IN CHARACTERIZATION, STANDARDIZATION, AND CERTIFICATION

The project conducts characterisation procedures, ensuring adherence to regulatory requirements. The computational tools developed within the project not only support these characterisations but also optimize the design processes. PROPLANET commits to providing a comprehensive roadmap, guiding the outcomes through the latest standards and regulations, with a focus towards product development and upscaling from TRL3 to TRL5. In essence, PROPLANET unfolds as a combination of computational innovation with binding standards, fostering a future where material design aligns seamlessly with safety, sustainability, and regulatory excellence.



PROPLANET PROGRESS UPDATE

PROGRESS ON SETTING UP PROPLANET ACTIVITIES AND TEAM ALIGNMENT

TECNALIA is monitoring the progress in setting up PROPLANET activities and is well aligned with the established plan. Scientific & Technical Coordination as well as the working Framework, requirements definition and team alignment have been successfully concluded, resulting in the timely submission of the relevant deliverables (D1.1 and D1.2), as outlined in the project schedule. Supervising and monitoring the technical advancement of the project is being carried out, which involves coordinating the progress of technical aspects, conducting reviews, and approving technical reports and deliverables.

Work is currently underway in preparing D1.3: "PROPLANET integration into standardisation process and roadmap for full standardisation", which is reflecting the project's adherence to the proposed timeline. Furthermore, the active engagement of end users as supporting partners in PROPLANET's planning activities significantly contributes to the strategic alignment of project activities and the specification of coatings, with a particular focus on individual use cases for thorough validation.



PROGRESS ON PROPLANET SSBD COATINGS DEVELOPMENT

During the first year of the PROPLANET project, significant progress was made in the development of SsbD textile coatings. With the aim of developing bio-based, biodegradable coatings for cotton and polyester, four different natural polysaccharides were tested as matrices, to which various natural or chemically modified natural substances were added. By adding the latter to the matrix, the natural polysaccharides were modified to ensure water and oil repellence, either by lowering the surface tension of the surface or by modifying the surface roughness of the coated textile. Depending on the viscosity of the formulation, three different application techniques were used: impregnation (dip coating), spray coating and rod coating. The water repellence of the sample was analysed by determining the water contact angle (WCA). The mechanical properties of the coated samples were also determined, as the coating should not degrade the basic properties of the textile material. As the aim is to develop a coating that must be suitable for the end user, the next step of the research is to ensure coating durability, following by washing and abrasion resistance tests of the coated samples.

MATHEMATICAL AND COMPUTATIONAL TOOLS FOR SAFE & SUSTAINABLE COATINGS

The work focusing on mathematical and computational tools for Safe and Sustainable coatings, showcases promising developments, led by IDENER. The construction of the PROPLANET database is well underway, with the foundational structure in place and the release of the first version (MS3) on track. Data acquisition efforts are in progress to ensure the comprehensive population of the database.

In parallel, significant advancements have been made related to the in silico toxicological models and environmental fate Perspective under the lead of NovaMechanics. The Box4Nano tool has undergone substantial upgrades, particularly geared towards enhancing its predictive capabilities for small molecules like PFAS. This is a critical aspect of understanding the potential toxicological impacts and the environmental fate of the coatings.

Moving to first-principles-based models and simulations to evaluate performance, it should be highlighted that successful modeling efforts have been conducted by RINA and the team. Specifically, hydrophobicity and oleophobicity have been modeled for specific compounds, including benchmark PFAS materials. This modeling work is fundamental for assessing the performance of coatings across diverse applications.

Under the task related to the development of data-driven algorithms aiming to Build PROPLANET Governing Equations, the initiation of this development phase is a significant step, as these algorithms will form the guiding principles for PROPLANET in the design and optimisation of coatings. Finally, the development of the PROPLANET Replication Tool, which plays a pivotal role in data acquisition and supports the overall construction of the database, has already commenced under the guidance of IDENER.



PROGRESS ON SUSTAINABILITY AND TOXICOLOGICAL ASSESSMENTS FOR SAFE AND SUSTAINABLE COATINGS

Over the course of twelve months, HOLOSS has made substantial progress in several key areas. Firstly, the team has successfully defined the necessary Key Performance Indicators (KPIs), while they also presented the Safety and Sustainability by Design (SSbD) criteria, laying the foundation for the project's focus on creating coatings that prioritise safety and sustainability.

One significant accomplishment is the identification and presentation of a list of potential certifications that the new products developed within the project could attain. This step is essential for ensuring that the coatings meet industry standards and regulations, further enhancing their market viability.

Furthermore, HOLOSS has conducted a gate-to-gate Life Cycle Assessment (LCA) from the production stage. This comprehensive assessment provides valuable insights into the environmental impact of the coatings throughout their entire life cycle. The results will not only guide eco-design decisions but will also assist manufacturers in formulating coating recipes that align with SSbD criteria right from the initial design phase.

Additionally, HOLOSS has been actively engaged in the development of a social Life Cycle Assessment (s-LCA) through an extensive literature review, focusing on chosen impact categories. This strategic approach ensures a thorough understanding of the coatings' social implications, contributing to a holistic evaluation of their sustainability.



PROGRESS ON EXPLOITATION, DISSEMINATION, COMMUNICATION AND SOCIAL ENGAGEMENT

Since the project's start, extensive planning and execution of dissemination and exploitation activities has been taking place. A comprehensive strategy has been set out, including the development of the project's identity, dissemination materials and several templates. The creation and maintenance of the PROPLANET project website, along with regular update on news, and digital content, have been under EXELISIS' preview. The team is managing social media pages on platforms including LinkedIn, Facebook, and Twitter, ensuring a consistent presence with weekly posts. EXELISIS also designed and produced printed materials including flyers, roll-ups, posters, and conference banners, complemented by two press releases to communicate the project widely. The ongoing collaboration between the dissemination manager and partners has facilitated the continuous refinement of the dissemination mapping of partner activities.

On the exploitation side, EXELISIS' focus during the initial project year involved a meticulous observation of the market landscape and key indicators that could impact the project environment, employing methodologies such as SWOT and PESTLE analysis, within detailed business plans that are under development. EXELISIS continues working on the IPR management methodology for the project and successfully finalised the first report on the risk assessment, including mitigation measures.

Furthermore, the stakeholder engagement strategy employed in PROPLANET was outlined, showcasing the outcomes achieved so far, and providing a condensed yet comprehensive view of the established methodological framework guiding our project. The stakeholder engagement strategy is crucial for fostering collaboration, feedback, and support from various entities involved in or impacted by our project. To achieve this 4 streaming events are planned to attract relevant stakeholders, the first of which has successfully been concluded during the first year.

Finally, 6 replication cases were selected, two for each of the research lines in PROPLANET (textiles, metal, glass) which is described in detail in the relevant deliverable. In particular, Textile coatings for umbrellas and for swimsuits, Metal coatings for automotive parts and for cookware and Glass coatings for building windows and for consumer electronics will be at the focus of our replication cases.

PROGRESS ON MANAGEMENT AND COORDINATION

Related to project management, several critical aspects have been meticulously addressed within the PROPLANET project. The comprehensive Project Management Plan, formulated at the project's outset, provides a structured framework that will be subject to periodic updates, ensuring its relevance and effectiveness. Concurrently, the ongoing monitoring of project activities is a testament to the commitment to real-time oversight and adaptability, with any necessary adjustments anticipated around the twelfth month.



Administrative and financial management, are underscoring the project's commitment to fiscal responsibility and efficient resource allocation. The establishment of a robust Data Management Plan, a critical milestone achieved in Month 6 and documented in Deliverable 8.1, reflects the project's dedication to systematic and secure handling of research data.

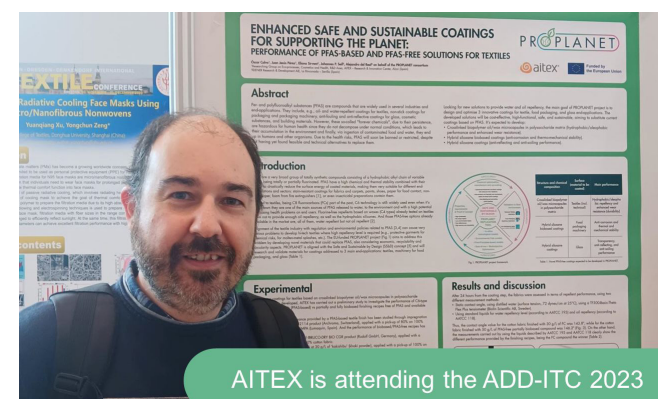
Furthermore, PROPLANET has proactively incorporated a gender and ethics dimension, exemplifying a commitment to fostering an inclusive and ethical working environment. This dimension serves as a guiding principle in decision-making processes, ensuring alignment with ethical standards and principles of gender equity.

In pursuit of collaborative synergy, PROPLANET has initiated activities with other EU-funded projects, namely ESTELLA, TORNADO, ZERO-F, and BIO-SUSHY. This collaborative approach not only enriches the project's ecosystem but also contributes to a broader knowledge exchange within the European research landscape. Together, these management and coordination efforts underscore the project's commitment to excellence, efficiency, and ethical considerations.

ATTENDANCE TO EVENTS

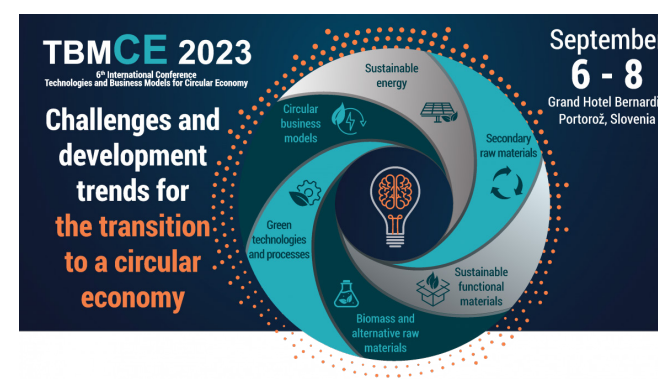
Our partner AITEX attended the Aachen-Dresden-Denkendorf International Textile Conference 2023 (ADD-ITC2023) in Dresden from Nov 30 - Dec 1. Experts and young professionals from industry and science came together, while AITEX showcased a poster presentation on PFAS-based and PFAS-free solutions for textiles.

[DISCOVER MORE ABOUT THE CONFERENCE](#)



HOLOSS attended the training event organised by the IRISS project on 22 September 2023. The training was addressed to SMEs and covered topics related to Safe-and-Sustainable-by-Design tools and case studies.

[FIND OUT MORE.](#)



Kemijski inštitut - National Institute of Chemistry attended the Technologies and Business Models for Circular Economy (TBMCE2023) Conference, discussing challenges and trends for a sustainable future. The event took place from 6 to 8 September 2023 in Slovenia.

[FIND OUT MORE.](#)

Kemijski inštitut - National Institute of Chemistry also joined the 29th annual meeting of the Slovenian Chemical Society at SKD2023. Their poster session was a great opportunity to share insights about the PROPLANET project and build connections with renowned researchers and industrial collaborators.

[FIND OUT MORE.](#)



ATTENDANCE TO EVENTS



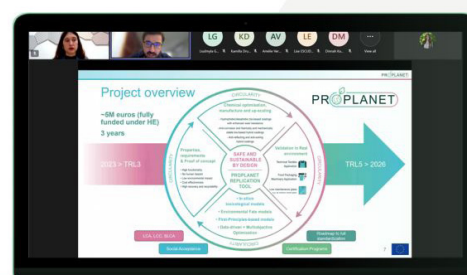
PROPLANET Project attended the ECOSYSTEX Conference during 18-20 October in Barcelona. AITEX and Kemijski inštitut - National Institute of Chemistry were amongst the numerous participants and had the opportunity to listen to attend cutting-edge lectures related to textile research. The event was hosted by Eurecat - Technology Centre of Catalonia.

On 2nd October 2023, HOLOSS attended the Green Deal SSbD Consultation on “Advancing safety and sustainability of chemicals through science-based strategies: service checks, gaps, bottlenecks, and the way forward,” organised by the Society of Environmental Toxicology and Chemistry (SETAC).



RINA attended the SUSGEM SUSTAINABLE SOL-GEL ENERGY MATERIALS workshop that took place at Castelló de la Plana, Spain from October 1st – 4th 2023. Our partner, RINA presented the general concept and objectives of the PROPLANET Project while also highlighting some preliminary computational results.

[CHECK THE EVENT OUT:](#)

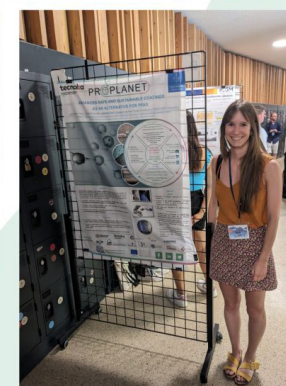


PROPLANET Project was presented at the 5th ECOSYSTEX Insights Series webinar, on 22 September 2023.

In this session, IDENER and AITEX collaboratively shared the project's objectives and impacts. During this event other EU initiatives were also presented, including RegioGreenTex, EU- r-LightBioCom and my-fi Project.



Tecnalia at the 10th European Silicon Days



10-12 July 2023

tecnalia

ATTENDANCE TO EVENTS

Our partner TECNALIA attended the 10th European Silicon Days event, where they presented a poster dedicated to PROPLANET Project.

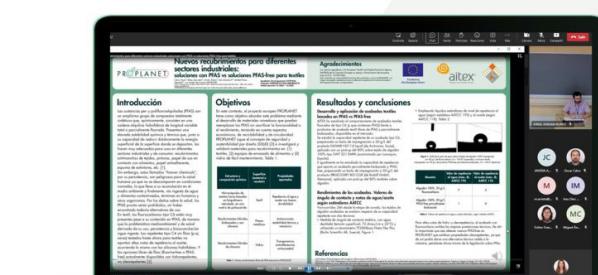
The conference was held on 10-12 July in Montpellier, France. The presentation centered around the project outcomes and the chemistry that is used to address the replacement of PFAS in everyday coatings.

[FIND OUT MORE.](#)

AITEX presented the PROPLANET Project at the X congreso de I+d+i organised by the Universitat Politècnica de València (UPV).

The event was held in Campus d'Alcoi and online on 5 and 6 July 2023.

[FIND OUT MORE.](#)



RINA attended SUSGEM 2023
1-4 October 2023



FIRST SOCIAL ENGAGEMENT EVENT

Register Now!!!



Social Engagement Event Tackling Pollutants, Protecting Health, and the Environment

11 December 2023

On December 11, the PROPLANET Project hosted a special social engagement event organised by HOLOSS, focusing on the theme “Tackling Pollutants, Protecting Health, and the Environment.” The event aimed to explore the profound impact of innovative coating materials on shaping a cleaner, safer, and more sustainable future.

The topics covered during the event included a detailed discussion on the three innovative coatings developed by the project. Key stakeholders, including experts from industry and science, actively participated in the event, contributing to insightful discussions. One of the highlights was the announcement of the creation of a platform for knowledge exchange using Slack, scheduled to commence from 2024 onwards. Additionally, a mini-test for the streaming event was conducted to evaluate the evolution of stakeholders’ knowledge improvement during the live session.

This event served as a crucial platform for fostering collaboration, knowledge sharing, and engagement among stakeholders involved in the PROPLANET Project. The active participation of key stakeholders emphasised the project’s commitment to addressing environmental challenges through innovative and sustainable coating solutions.

PROPLANET FEATURED IN OTHER CHANNELS



PROPLANET presentation and stakeholders invitation on the webpage of Slovenian textile Association

The PROPLANET consortium updates has been actively featured in various channels and events:

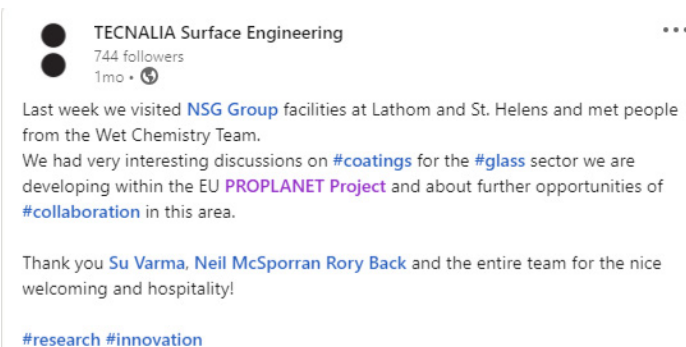
- ECOSYSTEX featured a PROPLANET presentation during their webinar, where IDENER had the opportunity to introduce PROPLANET to the audience.
- ECOSYSTEX showcased PROPLANET within their network, introducing the project to a wider audience and fostering collaboration.
- PROPLANET was presented on the webpage of the Slovenian Textile Association, reaching out to stakeholders in the textile industry.

- A live video lecture on the “Textile Industry of the Future” featured PROPLANET, highlighting the project’s significance in shaping sustainable practices.


- TECNALIA’s visit to PILKINGTON served as a platform for discussions on innovative coatings, strengthening collaborations in the glass sector.

- Communication efforts were directed towards the Reepack Use-Case, emphasizing PROPLANET’s impact and relevance in the industry.

- HOL incorporated information about the PROPLANET concept on their new webpage, showcasing the project’s advancements.



Visit of TECNALIA to PILKINGTON

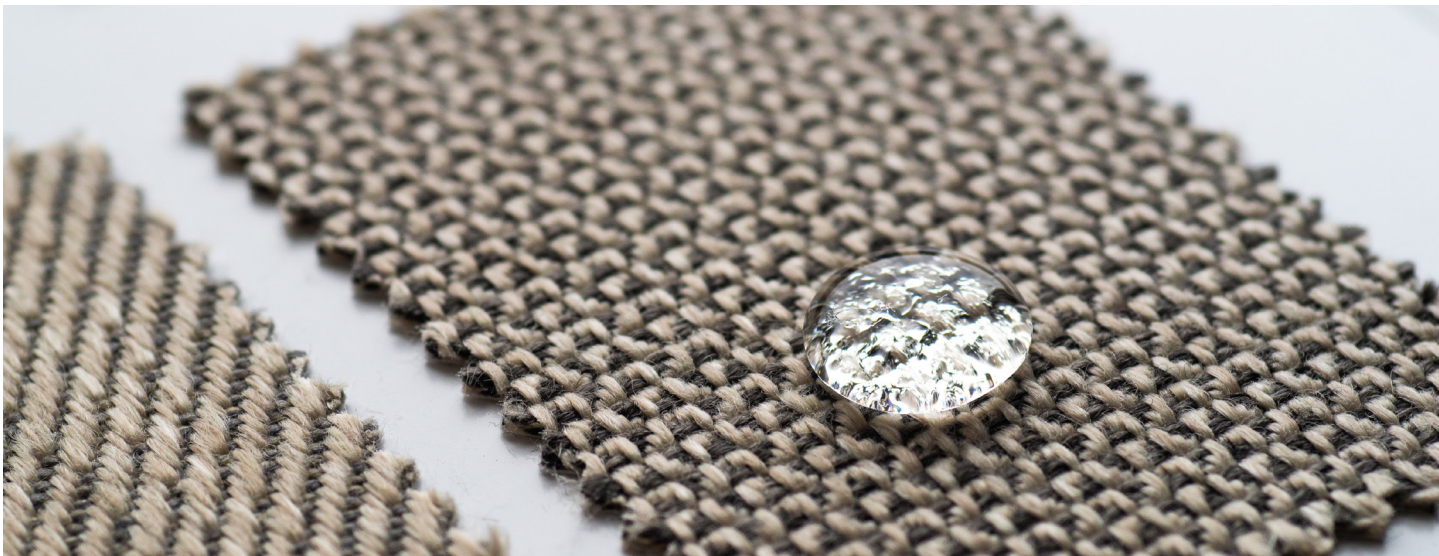


HOLOSS
373 followers
1mo •

On 11th of December at 10AM WEST Time, HOLOSS will organise a Streaming Event, following the tasks developed in PROPLANET, to inform the public of the need to substitute and eliminate the use of PFAS (Per- and Polyfluoroalkyl Substances) chemicals on our daily lives. PFAS are a group of human-made chemicals that have gained significant attention due to their widespread use, persistence in the environment, and potential adverse health and environmental effects. They are present in almost everything, including textiles, food-packaging, and glass. We will present the results that PROPLANET is achieving in finding solutions that are inherently Safe and Sustainable by Design in an informal, day-to-day language, and we encourage every citizen to join us. In the upcoming weeks, HOLOSS will release the registration link for the Streaming Event, so stay tuned for more news. For now, save the date in your agenda and sign up to help us get rid of toxic chemicals. If you to engage and learn more about PROPLANET, follow its social media: LinkedIn: <https://lnkd.in/gue5SpHj> Website: <https://lnkd.in/dJPTuFak> For further information, you can get in touch with us at: holoss@holoss.com



Communication about the first Streaming Event.



- Promotional activities and communications were carried out regarding a notable streaming event organised by PROPLANET.
- PROPLANET reshared a post from NanoSolveIT, indicating collaborative engagement and knowledge-sharing.
- PROPLANET shared information about the ECOSYSTEMEX webinar, amplifying awareness about sustainable initiatives.
- PROPLANET reshared a post about TECNALIAS's involvement at the 10th European Silicon Days, showcasing collaborative engagements.
- AITEX's participation in the X Congreso I+D+i was highlighted through PROPLANET's reshared post, fostering connections and synergies.

UPCOMING EVENTS

NILU AT THE NSFT WINTER MEETING (JANUARY 2024, BEITOSTØLEN, NORWAY)			
PARTNER	EVENT	DATE	LOCATION
NILU is planning to participate in the NSFT Winter Meeting. This event, hosted by the Norwegian Society of Pharmacology and Toxicology, serves as a valuable platform for experts to exchange knowledge and insights in the fields of pharmacology and toxicology. NILU's involvement indicates a commitment to staying updated about the latest developments in these critical areas, aligning with PROPLANET's focus on environmental and toxicity considerations in coating innovations.	The Norwegian Society of Pharmacology and Toxicology (NSFT) Winter Meeting.	January 2024	Beitostølen, Norway
RINA AT THE INTERNATIONAL SOL-GEL CONFERENCE 2024:			
PARTNER	EVENT	DATE	LOCATION
RINA-CSM is planning to attend the International Sol-Gel Conference 2024. This conference is a premier gathering for researchers and professionals working in the field of sol-gel science and technology. RINA-CSM aims to present computational results, showcasing the innovative aspects of the project. Participation in this conference signifies PROPLANET's commitment to leveraging cutting-edge computational tools for the development of sustainable coatings, further contributing to advancements in materials science.	International Sol-Gel Conference 2024.	1-6 September 2024	Berlin, Germany



MEET OUR FIRST 4 MEMBERS OF OUR CONSORTIUM

* Find more of our consortium members in the next PROPLANET newsletter...

HOLOSS is a technology R&D and consulting company with operations in Europe, specializing in the areas of decarbonisation and sustainability. HOLOSS will provide the social science and humanities activities within the project, including social studies and gender neutrality of results, as well as sustainability analysis and circularity studies

NILU is an independent, nonprofit research that aims to create sustainable development through internationally leading climate and environmental research. NILU undertakes various projects, related to the needs of management, industry, and business. These projects extend to collaborations with the Research Council of Norway and the European Union.



NIC (KEMIJSKI INŠTITUT) Through groundbreaking research, NIC forges new frontiers in scientific knowledge, enabling us to collaboratively shape the industries of tomorrow. By fostering education and collaboration, NIC empowers the next generation of scientists to make a lasting impact. In particular, NIC has vast expertise in the formulation and synthesis of bio-composites innovative coatings and characterisation techniques



NOVA Mechanics is an SME dedicated to the development of novel algorithms and platforms with cheminformatics & nanoinformatics excellence. NovaMechanics employs top-notch expertise, advanced software, and unique computing power to lead the way in designing and simulating molecules, towards innovative materials development.

PROPLANET

Enhanced Safe and Sustainable coatings for supporting the Planet

OUR CLUSTER

Throughout this period, NIC has actively engaged with four additional projects dedicated to advancing innovative and sustainable coating formulations. Therefore along with IRISS we are currently pitching with 5 EU projects.

MORE INFORMATION!

TORNADO

New routes of safe and sustainable by design water and oil repellent biobased coatings

The TORNADO project is dedicated to fostering a shift toward a secure circular economy by shaping the design, production, use, and end-of-life treatment of products. The project will pioneer the development of new organic and hybrid coatings, adhering to Safe and Sustainable by Design (SSbD) principles, featuring water and oil repellency. These coatings will undergo rigorous validation in industrial settings to match or surpass the performance of PFAS coatings. Testing will align with key textile, packaging, and kitchenware standards, ensuring waterproofness, oxygen barrier capability, and durability.

ZERO F

Development of verified safe and sustainable PFAS-free coatings for food packaging and upholstery textile applications.

ZeroF is innovating Safe-and-Sustainable-by-Design (SSbD) coatings, aiming to replace PFAS compounds in food packaging and upholstery textiles. These coatings boast limited water absorption, exceptional oil and grease resistance for packaging, and superior water and oil repellency for textiles. To achieve over 25% environmental improvement, the project employs renewable feedstock, non-toxic compounds, and enhances process efficiencies. PFAS are substituted with cellulose fatty acid esters for packaging and silane-based organic-inorganic hybrids for textiles.

BIO-SUSHY

Sustainable surface protection by glass-like hybrid and biomaterials coatings

ESTELLA aims to enhance the recyclability of challenging materials like thermosetting composites. The project focuses on designing bio-based epoxy resins with built-in recyclability through the integration of Covalent Adaptive Network (CAN) into the original epoxy structure. Various recycling methods, including chemical, biological, and mechanical techniques, will be explored to facilitate the safe and cost-effective separation of the newly synthesised thermosets into their components.

ESTELLA

DESIGN of bio-based Thermoset polymer with rEcyCLing capabILity by dynAmic bonds for bio-composite manufacturing

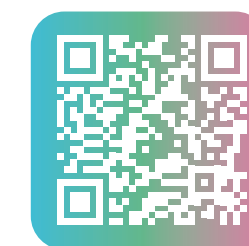
The BIO-SUSHY project, aims to create novel organic and hybrid coatings using bio-based additives, providing a sustainable design alternative to PFAS-based coatings. Embracing a safe and sustainable design approach, the project will leverage physics-based and data-driven modeling tools to forecast the repellent qualities of coating surfaces and material leaching mechanisms. These coatings will undergo pre-industrial scale validation on diverse substrates, spanning applications in textiles, glass, cosmetics, and food packaging.

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www.proplanet-project.eu
info@proplanet-project.eu

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