



# SUNSHINE

Safe and Sustainable Design for Advanced Materials

*Safe and Sustainable by  
Design Strategies for  
High-Performance Multi-  
Component **Nanomaterials***

*SUNSHINE project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 952924.*



# E-INFRASTRUCTURE FOR SAFE AND SUSTAINABLE DESIGN OF ADVANCED MATERIALS

SUNSHINE develops a novel e-infrastructure to foster dialogue, collaboration and information exchange between actors along the nanotechnology supply chain to facilitate the development and implementation of simple, robust, and cost-effective Safe and Sustainable by Design (SSbD) strategies for advanced multi-component nanomaterials (MCNMs).

Grounded on the Safe Innovation Approach\*, this digital platform will be a central information exchange hub for the SUNSHINE community.

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*\* The Safe Innovation Approach (SIA) combines the Safe by Design and Regulatory Preparedness concepts to address the possible health and environmental risks of novel materials. To achieve this, SIA relies on dialogue between industry and regulators and, as appropriate, other stakeholders. This dialogue ideally starts at an early stage of the innovation process and is facilitated by a Trusted Environment.*



## WHY SUNSHINE?

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Major industrial sectors such as construction, structural and functional materials, active ingredients, food, healthcare, energy, cosmetics and electronics are investing into research and technological development of advanced MCNMs. These new materials offer unprecedented technological benefits as the integration of different components in a unique system can produce new or improved functionalities. However, MCNMs also pose substantial design challenges as well as environmental, health and safety concerns.

SUNSHINE is an industry-oriented project, where leading research and technology organisations will cooperate with SMEs and large industries to develop and implement SSbD strategies for these novel materials. The goal is to increase the safety and sustainability of materials, products, and processes without compromising their functionality or economic viability.

# SPECIFIC OBJECTIVES

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To successfully develop and implement the SSbD strategies for MCNMs, SUNSHINE will:

## Create the SIA e-Infrastructure

to facilitate collaboration and information exchange along the supply chain.

## Employ Grouping and Read Across

to enable use of existing information for safe by design purposes.

## Contribute to Regulatory Preparedness

by promoting a two-way dialogue between industry and regulators to address regulatory concerns in the early stages of innovation, and by providing recommendations for adaptation of the current regulatory guidance and standard guidelines for MCNMs.

## Develop Multi-Scale Modelling Approaches

Identify and develop experimental methods and multi-scale modelling approaches and generate essential new knowledge and data to fill the gaps in our current understanding of the exposure, hazard, and functionality characteristics of the MCNMs, especially those arising from their unique properties and interactions.

## Develop Criteria and Guiding Principles

for sustainable design of materials, products and processes involving MCNMs.



*We will test the effectiveness of the SSbD strategies on the lab and pilot scales in case studies corresponding to supply chains of real products.*

# SUNSHINE CONCEPT

## A Safe Innovation Approach e-Infrastructure

for Safe and Sustainable Design Strategies and Regulatory Preparedness



Ideation



Scoping



Business Case



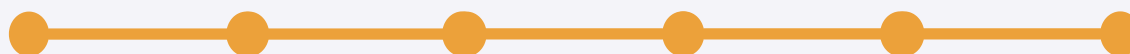
Development



Testing & Validation



Launch



### Safety, Functionality & Sustainability

SUNSHINE Design Principles



### Knowledge, Tools & Data

Insight to physicochemical properties, exposure, toxicity, sustainability and circularity



### Supply Chain Case Studies

From Food and Health to Energy, Construction and the Automotive Sector

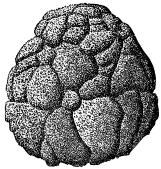
## Benefits of Innovator-Regulator Collaboration

SUNSHINE facilitates a two-way dialogue between innovators and regulators to help raise awareness and address regulatory concerns in the early stages of innovation. This can shorten the time of novel nanotechnology products to reach the market.



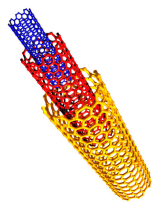
# SECTOR-SPECIFIC CASE STUDIES

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## MATERIALS

Structural and functional materials, including metal and non-metal oxides.



## ENERGY

E.g. graphene-carbon nanotube hybrids for electrodes and energy storage.



## FOOD

Food and feed technology, including MCNMs in biocidal coatings and high aspect ratio functionalised nanoclays for anti-pest packaging.



## CONSTRUCTION

E.g. metal oxide complexes used in advanced paints and scratch/abrasion resistant coatings.



## HEALTH

Pharma and health technology, including functionalised and carbon nanotube-coated metals and metal-oxides used in diagnostics and therapy.

# INTERESTED IN GETTING INVOLVED?

We are looking for individuals to form part of our stakeholder community. Should you be interested to join the SUNSHINE community, you will:

- be updated regularly on the latest developments concerning 'safe and sustainable by design' of advanced materials;
- receive periodic updates on the SUNSHINE progress and achievements;
- be invited to join our events and consultations activities, and
- have an active say in our activities to help us contribute to a safer and more sustainable advanced materials industry.

## Get in Touch

[www.h2020sunshine.eu](http://www.h2020sunshine.eu)

[info@h2020sunshine.eu](mailto:info@h2020sunshine.eu)



[@h2020sunshine](https://twitter.com/h2020sunshine)



[h2020 SUNSHINE](https://www.linkedin.com/company/h2020-sunshine)





# SUNSHINE PARTNERS



SUNSHINE project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 952924.

