

# NanoDesk: Advanced web tools to promote the implementation of nanotechnologies and a safe use of nanomaterials in the plastic industry

**Interreg**  
**Sudoe**  
European Regional Development Fund



## NanoDesk observatory

### Contents management, updates and expected improvements

**Arantxa Ballesteros Riaza**

**ITENE - Task Leader**

**Arantxa.ballesteros @itene.com**

**March 14th 2018**



UNIVERSITAT  
ROVIRA I VIRGILI



**INVASSAT**  
Institut Valencià de  
Seguretat i Salut en el Treball

## ! Outline

1. Current version of the observatory
2. Updates: interactive session & technological surveillance
3. Contents management
4. Summary conclusions

## 1. Current version of the observatory



# 1. Current version of the observatory

## □ The observatory at a glance



**WELCOME**

**Welcome to the Observatory on Nanotechnology Application and Safety in the Plastic Sector!**

The NanoDesk Observatory on Nanotechnology Application and Safety in the Plastic Sector is a web tool aimed at the analysis, dissemination, use and exploitation of information of strategic value for the decision-making of companies and institutions.

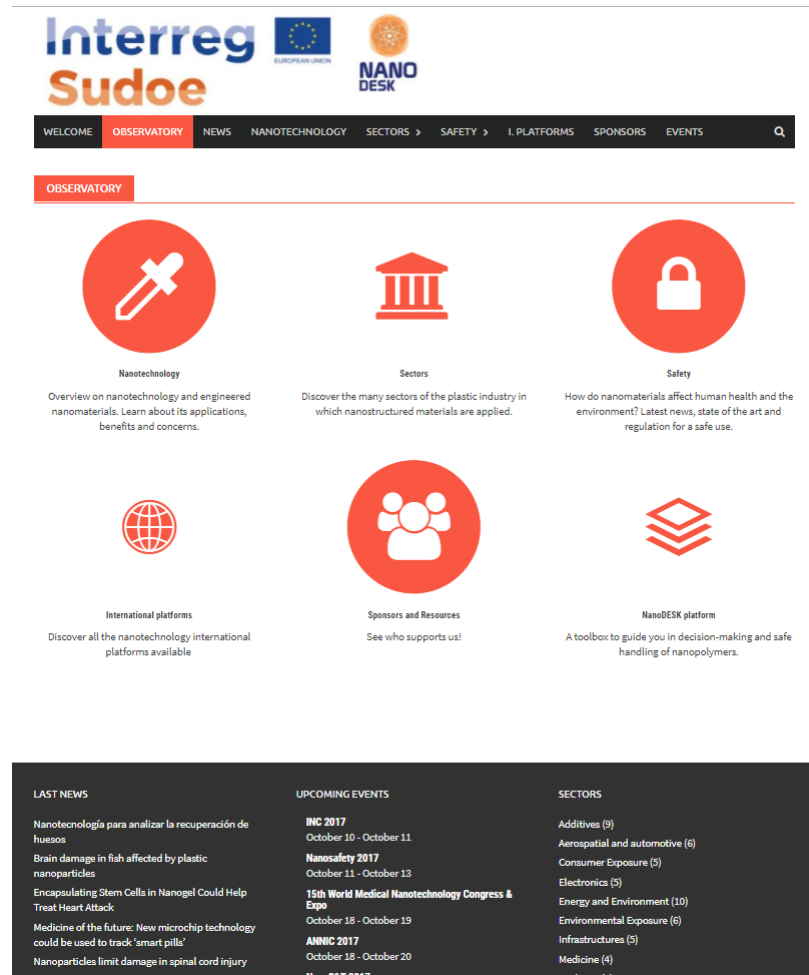
The goal of the portal is to promote technical viability and safe use of nanotechnology in the plastic sector, taking advantage of the results of the NanoDesk project and contributing directly to their dissemination.

Enter the NanoDesk Observatory and discover the world of the nanostructured plastic materials and their possible applications, be aware of new tendencies reading the latest news and learn how to safely handle nanopolymers.



[Go to the observatory](#)

Main page (welcome)



Main page (Access to the Observatory contents )

<http://observatory.sudoenanodesk.europeanprojects.net/>

# 1. Current version of the observatory

## The observatory at a glance

**WELCOME OBSERVATORY NEWS NANOTECHNOLOGY SECTORS SAFETY PLATFORMS SPONSORS EVENTS**

**NANOTECHNOLOGY**

**What is Nanotechnology?**

**Nanotechnology includes the study, design, creation, synthesis, manipulation and application of materials, devices and systems through the control of matter at the nanoscale.**

According to the EC, nanomaterial means any material containing those particles or in the form of aggregate or agglomerates, and in which 50% or more of those particles in the numerical granulometry have at least one of its dimensions in the size range between 1 and 100 nanometers. According to the number of dimensions at the nanoscale, three types of nanomaterials are distinguished: nanoparticles, nanofibres and nanotubes, depending on whether they are 0, 1, 2 or 3 dimension in the nanoscale respectively. For many years, nanomaterials have been produced by industry, although they were found either in nature or result from human activity.

Due to their small size, nanomaterials are governed not by the laws of classical mechanics, but by those of quantum mechanics, so that matter exhibits **completely new properties**. This is generally because nanoparticles have a greater surface area per weight than larger particles; they are therefore more reactive to some other molecules. For example studies have shown that nanoparticles of iron can be effective in the cleanup of chemicals in groundwater because they react more efficiently to those chemicals than larger iron particles. Thus, nanomaterials can have chemical, physical, electrical and mechanical properties more marked than those of the same material in the macroscale. These properties make them particularly suitable for many applications. They can enhance properties such as strength, durability, electrical conductivity, antimicrobial capacity, structural capabilities, thermal and chemical resistance, barrier to oxygen and moisture, low wear and friction, flame retardancy or flexibility.

For instance, nanoparticles are used increasingly in catalysis to boost chemical reactions. This reduces the quantity of catalytic materials necessary to produce desired results, saving money and reducing pollutants. Two other big applications are in petroleum refining and in automotive catalytic converters.

**WELCOME OBSERVATORY NEWS NANOTECHNOLOGY SECTORS SAFETY PLATFORMS SPONSORS EVENTS**

**SECTORS**

- Aerospatial and automobiles
- Additives
- Packaging
- Energy and Environment
- Electronics
- Infrastructure

**WELCOME OBSERVATORY NEWS NANOTECHNOLOGY SECTORS SAFETY PLATFORMS SPONSORS EVENTS**

**INTERNATIONAL PLATFORMS**

- ECHA** European Chemicals Agency (ECHA)  
The European Chemicals Agency (ECHA) is the driving force among regulatory authorities in implementing the EU's groundbreaking chemicals legislation for the benefit of human health and the environment as well as for innovation and competitiveness. ECHA today continues to engage with the legislative, administrative and other stakeholders, provides information on chemicals and addresses chemistry of concern.
- EUON** European Union Observatory for Nanomaterials (EUON)  
Focus on safety, innovation, research, properties and uses of the existing nanomaterials in the EU market.
- efsa** European Food Safety Authority  
EFSA is a European agency funded by the European Union that operates independently of the European legislative and executive institutions. Commission, Council, Parliament and EU Member States as a source of scientific advice and communication on risks associated with the food of daily life.
- OECD** Organisation for Economic Co-operation and Development (OECD)  
The Mission of the Organisation for Economic Co-operation and Development (OECD) is to promote policies that will improve the economic and social well-being of people around the world.
- ISO** International Organization for Standardization (ISO)  
ISO is an independent, non-governmental international organization with the objective of developing uniform, consensus based, market driven international standards that support innovation and provide solutions to global challenges.
- ISO** International Organization for Standardization

**WELCOME OBSERVATORY NEWS NANOTECHNOLOGY SECTORS SAFETY PLATFORMS SPONSORS EVENTS**

**OBSERVATORY**

**WELCOME OBSERVATORY NEWS NANOTECHNOLOGY SECTORS SAFETY PLATFORMS SPONSORS EVENTS**

**SAFETY**

- Worker exposure
- Consumer Exposure
- Environmental Exposure
- Toxicity and Ecotoxicity
- Regulation



**WELCOME OBSERVATORY NEWS NANOTECHNOLOGY SECTORS SAFETY PLATFORMS SPONSORS EVENTS**

**SPONSORS AND RESOURCES**

- TecnPackaging**  
Utilizada en Zaragoza, Tecnopackaging tiene como objeto principal la realización de trabajos de I+D+D sobre materiales poliméricos avanzados y sus procesos de transformación, para obtener nuevos plásticos industriales innovadores, que se dirigen a empresas que operan dentro o adyacentes a los sectores agroalimentario, cosmético, farmacéutico e industrial.
- Gnanomat**  
Gnanomat is a private nanotechnology company founded in 2014 focused in the development and manufacturing of novel nanomaterials to provide new solutions in different industrial applications with special emphasis in the area of Energy Storage.
- Nanomatp**  
Nanomatp is a Technology Based Company (BT) spin-off of the University of Granada, specialised in the design and synthesis of hybrid nanomaterials: nano-microcapsules, linear polymers and copolymers and intelligent materials with physicochemical properties adapted to the needs of the client ("A la medida" material).

**interreg Sudoe** Home About Tools Contact form Sign in Sign up

Home Limitations Scenario Design Execute Model Scenario Manager Scenario Manager Load Default Scenario Feedback

**Phase 2: physico-chemical properties of the substance (s)**

Select the physical state of the substance: **Solid** Liquid

Dustiness level: Very High High Medium Low Very Low

Moisture level: Very High High Medium Low Very Low

Solubility: Soluble Insoluble

Purity/Weight fraction: 100% 100%<100% 10%<100% 1%<100% <1%

# 1. Current version of the observatory

## □ The observatory at a glance

WELCOME OBSERVATORY NEWS NANOTECHNOLOGY SECTORS SAFETY I PLATFORMS SPONSORS EVENTS

OBSERVATORY



### Nanotechnology

Overview on nanotechnology and engineered nanomaterials. Learn about its applications, benefits and concerns.



### Sectors

Discover the many sectors of the plastic industry in which nanostructured materials are applied.



### Safety

How do nanomaterials affect human health and the environment? Latest news, state of the art and regulation for a safe use.



### International platforms

Discover all the nanotechnology international platforms available



### Sponsors and Resources

See who supports us!



### Nanodesk platform

A toolbox to guide you in decision-making and safe handling of nanopolymers.

WELCOME OBSERVATORY NEWS NANOTECHNOLOGY SECTORS SAFETY I PLATFORMS SPONSORS EVENTS

SECTORS



Aerospatial and automotive



Additives



Packaging



Energy and Environment



Electronics



Infrastructure

## Market segment - sectors

PACKAGING

Latest news:



Assessing the toxicity of nanoclay



Clay-based antimicrobial packaging keeps food fresh



Ethylene vinyl acetate (EVA) properties improved with layered hybrid nanofillers



Public wants labels for food nanotech



News

The use of nanofillers opens an opportunity for developing innovative and high-performance packaging materials. Accurately, nanotechnology is having an impact on several aspects of food science, from how food is grown to how it is packaged. Companies are developing nanomaterials that will make a difference not only in the taste of food, but also in **food safety**, and the health benefits that food delivers. Applications include **nano-filler reinforced packaging** (e.g. enhanced barrier properties), **active packaging** (e.g. antimicrobial), **intelligent packaging** (e.g. freshness indicators), and **biodegradable packaging**. Clay nanocomposites are being used to provide an impermeable barrier to gasses such as oxygen or carbon dioxide in lightweight bottles, cartons and packaging films. Storage bins are being produced with **silver nanoparticles** embedded in the plastic. The silver nanoparticles kill bacteria from any material that was previously stored in the bins, minimizing health risks from harmful bacteria.

### Other sectors

- Additives
- Aerospace and automotive
- Consumer Exposure
- Electronics
- Energy and Environment
- Environmental Exposure
- Infrastructures
- Medicine
- Medicine
- Packaging
- Regulation
- Safety
- Sector
- Toxicity and Ecotoxicity
- Uncategorized
- Worker Exposure

Application	Product or article	Improved properties	Nanomaterials
Plastic/packaging	Antimicrobial food packaging Reinforced polymers	Higher thermal resistance Flame retardant Higher stability Higher electrical conductivity Higher efficiency Manufacturing processes Barrier properties (gas and moisture) Antimicrobial UV barrier Lower vapour permeability Mechanical properties Self-cleaning Higher tensile strength Stiffness Antibacterial Electrical properties	Titanium oxide Silver Silicon oxide Calcium carbonate Carbon black Nanoclays Zinc oxide

Articles

Relevant Nanomaterials

Potential properties using ENMs

# 1. Current version of the observatory

## ☐ The observatory at a glance

Events for October 2017

There were no results found.

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Nanosafety related events

## Nanosafety related information

Regulatory activities

**RESEARCH CAPABILITIES**

Latest news:

- Nanoparticles of talc reach the people
- Assessing the toxicity of nanotip
- Germany publishes Expert Dialogue report on application of nanotechnologies in the construction sector

**Nanomaterials in workplaces**

An nanotechnology is expected to permeate all sectors and industries, it may lead to an increased concentration of these materials in the workplace, increasing the opportunities for indoor exposure to nanomaterials (NMs).

Nanomaterials are employed in a broad spectrum of potential activities that can be classified according with different criteria such as the origin (i.e. natural, accidental or anthropogenic) or the activities resulting in the exposure (e.g. fugitive emissions, handling and transfer of dusts, filling operations and/or dispersion of nanomaterials).

Figure 1. Life cycle of a nanomaterial in the industry (L. Otero, 2010)

The number of published data on the levels of exposure to NMs in the workplace has increased substantially over the last years. Characterising the release of airborne nanoparticles during activities, direct exposure via, application or treatment of product containing nanomaterials has always been a subject of interest in workplace air quality measurements. However, a lack of understanding still exists on the mechanisms that govern the release of NMs in occupational environments.

The modes of exposure are well characterised, being inhalation the most common route of exposure to airborne NMs in the workplace. This also has been investigated. However, most studies have shown NMs to be transdermal NMs absorption. Skin (epidermal) exposure can occur at the workplace from dermal contact, ingestion, occupational need to handle liquids, from inhaled particles (such that are present on the respiratory tract), and of dermal contact from the exposure to the nasal cavity following acute exposure.

Overall view of safety issues in the workplace

## 2. Updates: interactive session & technological surveillance






## 2. Updates: interactive session & technological surveillance

### Expected updates

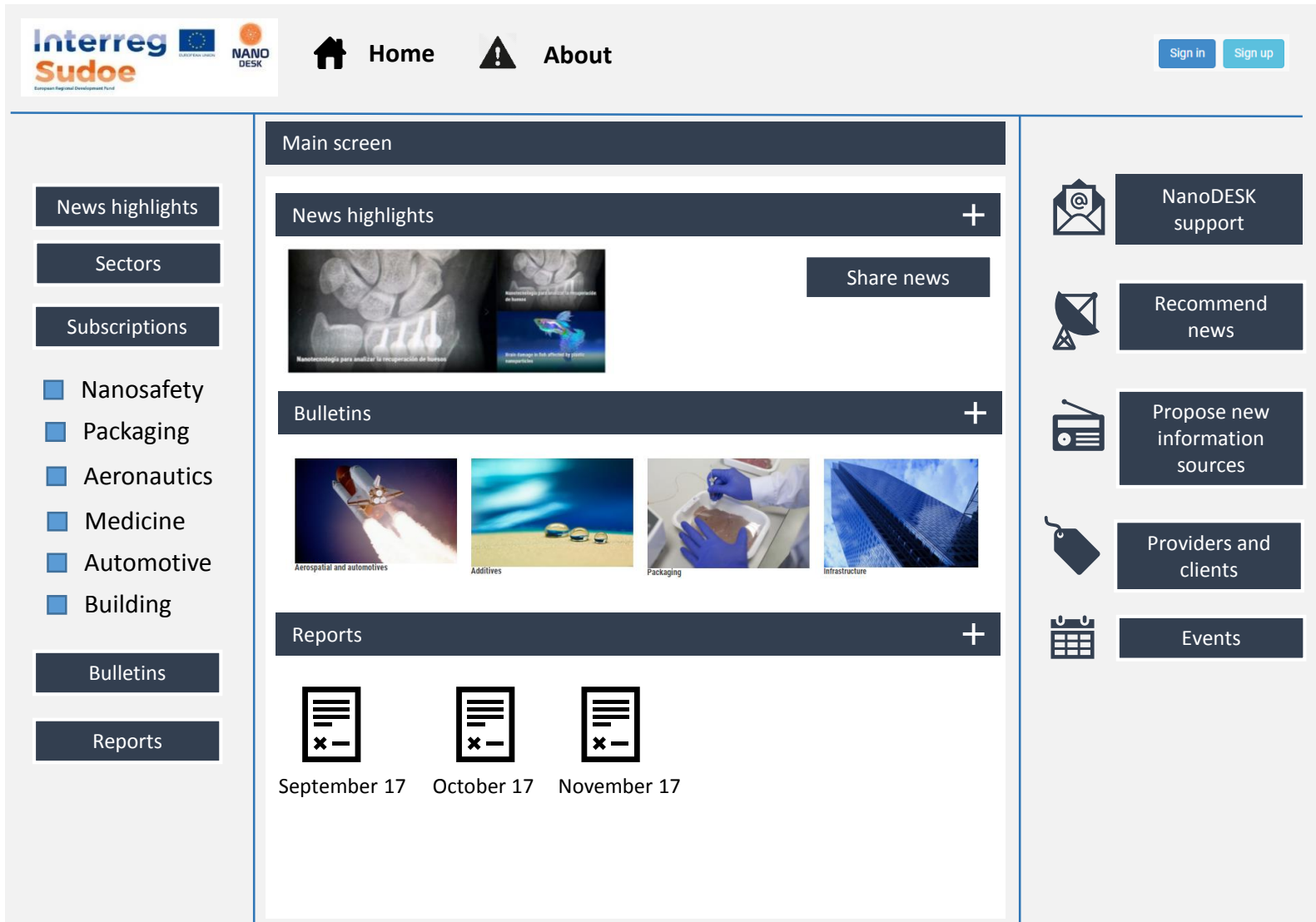
- New functionalities to support interaction with stakeholders
- Incorporation of customization options to support user experience and cover user needs: personalized visualization
- Definition of contents management procedures
- Automatization
- New visualization
- Timetable: new version scheduled in April 2018

### Developed Steps

- 
- Definition of functionalizes following proposal + IT experts recommendations (November 2017)
  - Contact with 3 external providers following “best value of money principle”
  - Design of the beta version to obtain a “best offer” (November 2017)
  - Analysis with GT leaders and INVASSAT before contracting (December 2017)
  - Start of the development: January - April 2018

## 2. Updates: interactive session & technological surveillance

### ! Proposed Lay-Outs



The proposed website layout features a top navigation bar with the Interreg Sudoe logo, a home icon, an 'About' link with a warning icon, and 'Sign in' and 'Sign up' buttons. The main content area is divided into three columns. The left column contains a vertical menu with buttons for 'News highlights', 'Sectors', 'Subscriptions', and a list of sectors: Nanosafety, Packaging, Aeronautics, Medicine, Automotive, and Building. Below these are buttons for 'Bulletins' and 'Reports'. The middle column displays a 'Main screen' with sections for 'News highlights' (including a 'Share news' button), 'Bulletins' (with four category thumbnails: Aeronautics and automobiles, Additives, Packaging, and Infrastructure), and 'Reports' (with three report icons for September 17, October 17, and November 17). The right column contains a sidebar with icons and buttons for 'NanoDESK support', 'Recommend news', 'Propose new information sources', 'Providers and clients', and 'Events'.

# 2. Updates: interactive session & technological surveillance



## Information sharing

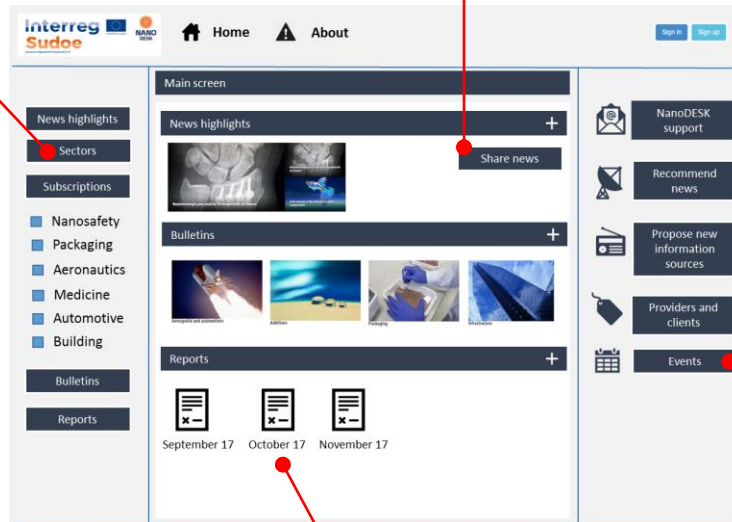
New Message

To: user

Title

Content

Send Cancel



The screenshot shows the website's main interface. On the left is a navigation menu with categories like 'Sectors' (Nanosafety, Packaging, Aeronautics, Medicine, Automotive, Building) and 'Reports'. The main content area features 'News highlights', 'Bulletins', and 'Reports' sections. A 'Share news' button is visible. On the right, there's a sidebar with options for 'NanoDESK support', 'Recommend news', 'Propose new information sources', 'Providers and clients', and 'Events'. A red dot is placed on the 'Events' button.

## Contacte con nosotros

Nombre \*

Apellidos \*

Correo electrónico \*

Asunto \*

Mensaje \*

[Acepto los términos y condiciones](#)

Enviar

Events for October 2017

MONDAY	TUE DAY	WEDNES DAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY



Vigilancia de Noticias  
Relacionadas con la Nanoseguridad



Editor: Carlos Fitó  
Clasificación: Uso interno de ITENE  
Categoría de publicaciones: Intersud

## 3. Contents management

### 3. Contents management

#### □ Proposed activities

- Definition of roles and responsibilities
- Roles: “observer”, “analyst”, “editor”, “manager”

Roles	Actions	Who
<b>Observer</b>	Identification of relevant sources, screening of documents and news on a week basis	All
<b>Analyst</b>	Analysis of recommended news, papers, technical reports, as well as any other source recommended by observers. Clustering and classification of the information	One technician pointed by each entity. Weekly
<b>Editor</b>	Upload news and develop bulletins	One technician pointed by each entity. Monthly.
<b>Manager</b>	Publication and contents validations	INVASSAT / ITENE
<b>Webmaster</b>	Management of the software	ITENE





- Definition of roles and persons (31/10/2017)
- Start date: 01/12/2017

## 4. Summary conclusions



## 4. Summary conclusions

### To conclude....

-  A close cooperation between the members of the consortium is mandatory to ensure sustainability and viability
-  The selection of proper sources will be of prime importance to obtain a relevant amount of news and events across the sectors under the scope of the project.
-  A proper management of the roles and responsibilities in the consortium will promote “cost effectiveness”
-  Identification of end users, feedback from stakeholders and a “SMART design” of the observatory will support the project to achieve our expected outcomes



NanoDesk: Advanced web tools to promote the implementation of nanotechnologies and a safe use of nanomaterials in the plastic industry

# Thank you for your attention ;

Arantxa Ballesteros  
Arantxa.ballesteros @itene.com



Interreg  
Sudoe  
European Regional Development Fund



UNIVERSITAT  
ROVIRA I VIRGILI



INVASSAT  
Institut Valencià de  
Seguretat i Salut en el Treball