



**National Institute for R&D in Microtechnologies,  
Laboratory of Nanotechnology is partner in  
the FP7 Collaborative Project - NanoSustain**

**THEME 4 NMP** - Nanosciences, Nanotechnologies, Materials and new Production Technologies and Theme ENVIRONMENT (Small or medium-scale focused research project)

**Project acronym: NanoSustain (2009-2012)**

**Project full title:** Development of sustainable solutions for nanotechnology-based products based on hazard characterization and LCA

### **CONCEPT**

The project concept is **based on the sustainability principle**, which means that the use of **new materials, like engineered nanomaterials and associated products, must not only meet human needs of the present but also of future generations**. This concept will be tested and realized by characterizing the properties of selected relevant nanomaterials and products at the various stages of their lifecycle in relation to possible impacts on human health and the environment and by taking reuseability, recyclability and/or ability for final treatment and/or disposal and reintegration into geological cycles as an option for the development of sustainable products into account.

### **PARTNERS**

Nordmiljö (Coordinator) NOMI (Sweden), The Institute of Nanotechnology, ION(UK), National Research Centre for the Working Environment, NRCWE (DK), Technical Research Centre of Finland, VTT (FI), University of Bremen, UniHB (DE), Veneto Nanotech, VN (I), European Commission Joint Research Centre, JRC (I), Kaunas University of Technology, KTU(LT), National Institute for R&D in Microtechnologies, IMT (RO), Nanologica, NLAB (S), Nanogate, NGAG (DE), UPM Kymmene, UPM (FI)

### **Objectives**

Main objective of the **NanoSustain** project is to explore and examine new solutions for the sustainable design, use, re-use, recycling and final treatment and/or disposal of specific nanomaterials and associated products. This will be based on a comprehensive hazard characterization and impact assessment of selected environmentally and economically relevant products.

**Objective 1: Hazard characterization**

**Objective 2: Life Cycle Assessment and Life Cycle Impact Assessment**

**Objective 3: Human health and environmental impact assessment**

**Objective 4: Technological solutions**

**IMT Role and main tasks in NanoSustain:** IMT will in particular contribute to WP3 to physico-chemical characterization and analysis of selected test materials and products, but also to WP5 for developing and designing new product properties and applications for selected nanomaterials, or synthesizing new nanoparticles for new areas of applications.

- NP morphology will be investigated by SEM, size distribution by Dynamic Light Scattering and Photon Correlation Spectroscopy, crystalline structure by X-ray diffraction;
- NP interaction with other molecules (bioaccumulation of organic contaminants) will be investigated by FTIR, Raman, and optical absorption methods.

**Nanomaterials and associated products proposed to be studied:**

- **Nanocellulosic materials**
- **CNT modified epoxy composite materials**
- **Nano ZnO based composites**
- **Nano TiO<sub>2</sub> based products**