



Welcome to the 2nd NanoSustain Newsletter

Dear Readers,

Nanotechnology has been cited as a future key technology with the potential to revolutionise many aspects of human society. And indeed, the manufacture and production of new materials at the nanoscale seems to open unforeseen and unique opportunities for science, industries and consumers to benefit from more intelligent, more economic and more sustainable products and processes.

Sustainability was one of the founding ideas behind NanoSustain, a new medium-scale EU FP7 project, which started in May 2010, with the aim of ensuring that this particular criteria is well addressed and considered when developing and using nanotechnology based materials and products, in particular at the end of their useful life.

To include all relevant after-production and after-use phases of nanomaterials when reflecting on sustainability is crucial for a holistic understanding and weighing of their benefit and impact, and to ensure that these materials can be safely returned into economic and natural cycles without harming man or nature. Due to their unique properties and associated uncertainties, designing and working with these new materials needs close cooperation between stakeholders involved on all safety aspects, not only in Europe but also globally.

For this reason NanoSustain is strongly committed to contributing to the development of a proper and internationally accepted risk culture on nanotechnology, to meet present and future challenges associated with manufacturing, application, recycling and/or disposal of engineered nanomaterials, and to safeguard sustainability.

This 2nd NanoSustain Newsletter will inform you about the status of the project, help you to catch up with latest progress and developments made in the field of nanosafety, and highlight upcoming events, new publications and perspectives.

I also invite you to follow the project by visiting our website at: www.nanosustain.eu

I hope you enjoy reading this 2nd NanoSustain Newsletter!

Rudolf Reuther

NanoSustain coordinator

rudolf.reuther@enas-online.com

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**WP1: Project management and scientific and technical coordination**

In November 16-18, 2010, NanoSustain organized and implemented the 2nd regular project meeting in Ispra, Italy, to present and discuss the ongoing work and preliminary results obtained during the first 6 months of the project, and to prepare next steps and future actions according to the work plan, including the project's contribution to the Nanosafety cluster and cooperation with other projects.

WP2: Data gathering, generation, evaluation, and validation

With the help of the industrial partners involved in the project, a preliminary product database has been designed and established for all 4 selected nanomaterials, and a 1st version of the database has been uploaded on the intranet of the project website. New data generated during the project will be continuously fed into this technical database, after careful validation and quality checking.

This database will evolve in parallel with the literature database, where newly published relevant papers are continuously added, to keep project partners up-to-date concerning latest advancements on EHS aspects of nanomaterials.

After the NanoSafety Cluster database event, and in close cooperation with other projects, NanoSustain will undertake all efforts to contribute to the harmonisation of material and literature databases created by individual projects for various purposes, and their integration within the Nanosafety cluster, towards the creation of a common EU database. For this reason, the project is strongly engaged in Working Group 4 on the development of a central research database within the Nanosafety cluster.

WP3: Hazard characterisation and human health & environmental impact assessment

In WP3 life-cycle relevant exposure scenarios and materials have been identified for the selected nanomaterials (nanocellulose, nano-TiO₂, CNT, nano-ZnO) and appropriate test materials prepared and sent to all partners for testing and characterization. First results on the physico-chemical properties of the materials are already available. Also animal experiments have been designed and are ready to be used for toxicological testing. Concerning ecotoxicological studies, the relevant literature has been reviewed and the materials and methods chosen for testing. In addition, test sanding of CNT containing epoxy plates has been done and appropriate weathering studies are planned in cooperation with EU FP7 NanoHouse and the Danish Flügger company.

WP4: Life cycle assessment

During the first half year, work in WP4 has focused on a critical evaluation of the published literature and data on life cycle analysis (LCA) of nanomaterials and on nanotechnology based applications. More than 35 publications have been analysed so far focusing on CNT, metallic oxides amongst other materials.

A questionnaire on manufacturing processes of nanomaterials has also been prepared, sent to manufacturers and partly analysed. Specific process models for the application and use phase, including all relevant material flows of selected nanoproducts has been developed. On this basis we are working on the development of specific models for the end-of-life and recycling phases (re-use, recycling and/or final treatment and disposal) of nanoproducts.

WP5: Development of technical solutions for use, recycling & final treatment

So far in WP5 nanocellulose has been produced and characterised. The experimental work to be carried out regarding the organic recycling of nanocellulose, the melting of ZnO containing glass, the incineration of MWCNT containing products and the leaching of nanoparticles under landfill conditions is about to start.

WP6: Dissemination and exploitation of project results

Recent work within WP6 has focused on improving and updating the project website and partner intranet to improve the visibility of the project and also to support the work of the other work packages.

Organisation of both a Dissemination Event (12th May, Glasgow) and LCA Training Workshop (July, Bre-



As already announced in the 1st NanoSustain Newsletter, NanoSustain and NanoHouse have agreed to work together in the study of weathering and abrasion of nanomaterials in painted boards. Additional weathering tests will also be undertaken by the Danish paint manufacturer "Flügger", who provided the test material, allowing an intercomparison and validation of obtained results. A cooperation agreement was also concluded with NEPHH on LCA-relevant issues and methodologies. Mutual agreements on the non-disclosure of confidential information are currently in preparation and will be signed by the concerned project partners.

Meanwhile, a new initiative has been launched by the coordinators of the EU FP7 NanoPolyTox (Socorro Vazquez-Campos, LEITAT) and NEPHH projects (Maria Blazquez, INKOA) to achieve a close cooperation with NanoSustain in addition to similar EU FP7 projects, including NanoHouse, NanoFate and ENPRA. As a first step, a common template was suggested and distributed to identify fields and activities, where synergies can be used, duplication of work avoided, and the impact of projects increased.

High Level Symposium on Nanosafety Challenges

David Rickerby (JRC) was invited by the British Embassy in Prague to attend the High Level Symposium on Nanosafety Challenges on 29th & 30th November 2010, where he presented a poster outlining the aims of the NanoSustain project and distributed copies of the project flyer and fact sheet to delegates. The Symposium was organised by the Czech Academy of Sciences, the British Embassy in Prague, the UK Science and Innovation Network, the Institute of Occupational Medicine, Edinburgh, the Institute for Work and Health in Lausanne, and the European Network on the Health and Environmental Impact of Nanomaterials. The meeting was attended by policy makers and scientists from 16 countries including the UK, France, Germany, the Czech Republic, and the USA.

'Nanoparticles in paints' Lecture

The Nanosustain project was presented in a lecture "Nanoparticles in paints" by Anne Thoustrup Saber (NCRWE) at NIVA Nordic Tour seminar "Health effects and risks of nanoparticles" in Copenhagen on the 27th October 2010. The seminar was arranged by The Nordic Institute for Advanced Training in Occupational Health.

UniHB activities

Michael Steinfeldt (UniHB), who leads NanoSustain's life cycle analysis work package, was invited by the Nagano Techno Foundation to travel to Japan in November 2010 and present two lectures at the EcoBalance 2010 conference (<http://www.sntt.or.jp/EcoBalance2010/top.php>) and 3rd International Nano Workshop in Nagano (http://www.tech.or.jp/cluster/pdf/Nano_Workshop3_English.pdf)

Michael also had a very interesting meeting concerning cooperation, particularly in regard to TiO₂, with EMPA researchers (Claudia Som, Roland Hischer and Bernd Nowack) and the University of Bremen (Henning Wigger). They are also partners in the **NanoHouse** project.; one work-package of which also focuses on the topic of LCA in the project.



NanoImpactNet

**NanoSafety
Cluster**

3rd NanoImpactNet conference and Nanosafety cluster review meeting

Building a bridge from NanoImpactNet to nanomedical research, 14th - 17th February 2011 in Lausanne, Switzerland

NanoImpactNet is a FP7 network supporting the collaboration between relevant EU projects by, amongst other actions, organising specific international conferences. The planned conference will present and discuss new research results in the light of the interaction existing between nanomedicine and human and environmental impact issues, and possible future implications, by means of oral and poster presentations, networking and brokerage events, discussion groups and training schools. For more information: <http://nanoimpactnet.eu/>

Following the 3rd NanoImpactNet conference, the **NanoSafety cluster** will also meet again in Lausanne on the 17th February 2011, to review the contribution of the various cluster projects to the ongoing activities, and to discuss new views, expectations and suggestions on how to better organise, coordinate and advance the future work of this increasingly expanding trans-national European nanosafety platform. As a member of the cluster, NanoSustain will also participate in the meeting.

NanoSafety Cluster Compendium

A new update of the NanoSafety cluster Compendium published in 2010 will be issued by the NanoImpactNet project for the year 2011 and will be made available during the conference (see: <http://www.nanoimpactnet.eu/uploads/Compendium%20NanoSafety%20Cluster%202010.pdf>)

NanoSafety cluster meeting in Prague, Czech Republic, 1st December 2010

Members of the NanoSafety cluster met in Prague to debate on questions of how to further develop the structure and implementation of planned cluster activities; however, many questions remain. During the meeting, 3 Working Groups (WGs) came together (on database, hazard and exposure, and on characterization) and prepared short statements of the results of their discussion. Some WGs still require development and/or lack coordination. This and all open questions will be taken up again during the NanoSafety review meeting in Lausanne, which will be on the 17th February 2011. NanoSustain was represented at the Prague Meeting by Stefano Pozzi Mucelli (Veneto Nanotech) and by Rudolf Reuther (NordMiljö AB), who both participated in the Database WG meeting. As an outcome of that meeting, it was decided to provide a common template for all cluster projects who are establishing a database, to identify basic bioassays and test materials used, and proper means of checking data quality.



EU-US workshop on NanoSafety

A joint EU-USA workshop on nanosafety will take place at the George Washington University, US, on 11th-12th March 2011, to establish and boost the much needed collaboration between these two major players on all relevant nanosafety issues. NanoSustain will be represented by Rudolf Reuther (NordMiljö AB), the project coordinator.



Nanologica AB launch NLAB Materials Online Store

Nanologica AB, one of the industrial SME partners of NanoSustain, has recently launched the online platform NLAB Materials, which could be interesting for both research and industry to gain a wide range of highly characterized nanoporous materials (developed by Nanologica AB) with different morphology, particle and pore sizes, functionalization, composition and encapsulated actives (www.nlabmaterials.com).

Online Store for Nanoporous Materials!

NanoSustain Meetings & Events

3rd Regular NanoSustain project meeting

NanoSustain's 3rd regular project meeting will take place on the 10th and 11th May 2011 in Glasgow, UK, to discuss initial scientific data and results achieved during the first project year; in particular concerning characterisation, hazard, exposure and LC assessment of selected nanomaterials, as well as the status of laboratory experiments planned for the recycling, treatment and disposal of selected nanomaterials. The discussion will be shared with the experts from the project's External Advisory Board, who have been invited to join the meeting.

First Nanosustain Dissemination Event

NanoSustain is organising its first dissemination event to present results obtained so far in Work Package 2 (focusing on data collection, generation, evaluation and validation). Experts from other projects and other interested stakeholders will be invited to join the meeting, to discuss new aspects and share experience. This event will take place on 12th May 2011 following the 3rd regular NanoSustain project meeting in Glasgow, UK. For more information and registration, please contact: Eleanor O'Rourke (IoN) at Eleanor.orourke@nano.org.uk.

First NanoSustain Training workshop

NanoSustain is also organising a training workshop between 27th-29th July 2011 at the University of Bremen, Germany, to introduce relevant LCA issues and associated methodologies relevant to engineered nanomaterials (ENP); this will include an introduction and demonstration of the modelling of the life cycle of ENPs using the 'Umberto' Software. Main target groups will be experts specialised in LCA of nanomaterials, and interested PhD and post graduate students. The training event will be led by Michael Steinfeld from the University of Bremen, who is leading the work on LCA within NanoSustain. For more information and registration, please contact: Eleanor O'Rourke (IoN) at Eleanor.orourke@nano.org.uk.

NordMiljö AB (NOMI) is the project coordinator and mainly responsible for the operational management, administration and S/T coordination of the planned work, including progress control and reporting to the Commission.

The **Institute of Nanotechnology (IoN)** will be responsible as WP6 leader for the dissemination and exploitation of the project results through a regular newsletter, training workshops, and dissemination events. In addition, the IoN will also be providing coordination support.

Veneto Nanotech (VN) will lead WP2, build up the necessary project-specific database and ensure validation and access of already existing relevant data, and of newly generated data, to all project partners.

The **National Research Centre for the Working Environment (NCRWE)** is responsible as WP3 leader for the production of after-production materials for further testing, for producing human exposure data and for the toxicological testing of the materials in animals

Universität Bremen (UniHB) is the leader of WP4 and responsible for the Life Cycle Assessment on selected nanomaterials and nanoproducts and the development and operationalization of criteria and guiding principles for precautionary design of engineered nanomaterials.

The Technical Research Centre of Finland (VTT) will develop as WP5 leader innovative solutions for recycling, final treatment and disposal of selected nanotechnology-based materials and products, and carry out appropriate ecotoxicology studies

The **Joint Research Centre (JRC)** will help to fill knowledge gaps related to the behaviour of the selected manufactured nanomaterials in ecosystems. This will contribute to the development and implementation of testing methods and assessment of the distribution, transport, transformation and fate of selected nanomaterials, and their effects on human health and the environment.

Kaunas University of Technology (KTU) will participate in the physico-chemical characterization and analysis of the selected test nanomaterials and products, and will develop and test an analytical method appropriate to detect and quantify engineered nanoparticles in various environmental matrices.

National Institute for Research & Development in Microtechnologies (IMT) will participate in the physico-chemical characterization and analysis of the selected test materials and products, and in the development and design of new material & product properties and applications, or in new material synthesis for novel applications.

Nanologica AB (NLAB) will provide the CNT-composite materials and associated materials data, contribute to their physical-chemical characterization, and support the exploration of treatment and disposal technologies.

Nanogate (NGAG) will provide a ready-to-use nano-ZnO based test material and associated product data and contribute to the technical exploration and design of new solutions for sustainable use, recycling and final treatment of the provided test material.

UPM-Kymmene (UPM) will supply nano-fibres (nanocellulose) and associated product data, and contribute to the design and exploration of technical solutions for their recycling and final treatment.

