

Enabling Responsible Innovations of Nanotechnologies Stakeholder Engagement Workshop



Brussels, 24 June 2008

– Workshop Documentation –

Executive Summary

On June 24 2008 CEFIC invited stakeholders from public authorities, civil society groups and academia for an open exchange of information and an initializing workshop towards an ongoing dialogue on nanotechnologies. The objective of the workshop was to start engagement with stakeholders to identify what is needed to ensure their confidence in nanotechnologies and discuss how these needs can be fulfilled.

Speakers from the EU Commission, scientific coordinators of NGO Groups, and scientists gave presentations on the latest Commission communication on nanotech regulation, on scientific results and their expectations towards the informational exchange.

Four companies shared information about their innovation to market process and how they ensure the safe use of specific nano-enabled products, explaining how the nanomaterials work and why they are used within these products.

The stakeholder engagement workshop was accompanied and facilitated by the Swiss Risk Dialogue Foundation.

In dialogue sessions, participants were asked 4 questions which included the following answers:

Q: What makes you confident in the product's safety of a coating application?

Stakeholder answers/recommendations:

- Implement Voluntary Codes of Conduct
- Provide information about safe-use proactively
- Work on harmonisation of risk assessment methods
- Assure easy access to relevant information
- Build on an independent system to gain trusted information such as that provided by the European Chemicals Agency as part of the chemicals regulation, REACH
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Q: What kind of information has to be shared?

Stakeholder answers/recommendations:

- Offer information packages aimed at different knowledge levels
- Focus on limiting potential exposure for workers and consumers
- Use Safety Data Sheets for communication along the value chain
- Define criteria for the quality and adequacy of information
- Better communicate existing risk management measures within the existing regulatory framework

Q: What are the priority environmental challenges on which nanotech should focus?

Stakeholder answers/recommendations:

- To define environmental goals
- To solve environmental challenges without creating others by taking a full life-cycle approach
- To contribute to the challenge of climate change, resource efficiency, energy storage, water purification, waste and pesticides and to achieve the millennium goals
- To invest in risk-benefit analysis for each application
- To support SMEs with risk management efforts

Q: What are the next steps towards an integrated dialogue?

Stakeholder answers/recommendations:

- To coordinate national and international dialogues
- To encourage a higher representation of civil society groups
- To clarify the key objectives and benefits for both industry and its stakeholders
- To work in smaller groups on questions that have been sent out to participants in advance.

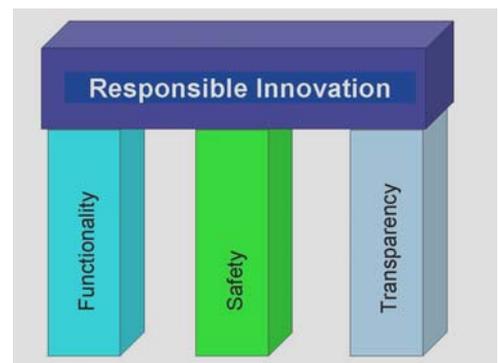
Next Steps:

Cefic will take up suggestions made during the first stakeholder engagement workshop and continue follow-up consultations with its stakeholders so that, by the end of 2008, Cefic will present proposals for a more focussed engagement during 2009.

Nanotechnologies are promising a huge step in innovation for a higher efficiency of solar panels, for light weight materials in the auto motive sector, for longer lasting coatings for houses or scratch-proof coatings for polymers. Industry and public authorities are investing a lot of money to assure that this positive potential can be used in a safe, responsible and sustainable way. In October 2007 Robert Madelin, Director General, DG Sanco of the EU-Commission, stressed the necessity to inform public authorities, NGO's and the general public in a open, proactive way about functionality, benefits and risk related questions of nanoproducts.

The European Chemical Industry Council (CEPIC) took up this challenge and organized a first stakeholder engagement workshop. The purpose of this meeting was to discuss how to foster the responsible development of sustainable innovations based on nanotech and how to achieve greater transparency and engagement with civil society. CEPIC invited regulators, environmental and consumer organizations, trade unions, academics and industry. The stakeholder engagement process was accompanied and facilitated by Risk Dialogue Foundation, St Gallen.

In a pre-dialogue-phase industry had identified two priorities of themes to work on. First the coatings with the highest level of marketed, consumer relevant products. Second the environmental technologies with the hugest potential for the future to solve challenges like energy efficiency and renewable energies. For both fields of applications major international companies and small and medium sized companies of the chemical industry provided examples with transparent information about the functionality and the safety of products.



CEPIC members also identified the food and the cosmetic area as to be from high importance for dialogues. Due to the fact that food companies are represented by CIAA and for cosmetics COLIPA has to take the lead in organizing dialogues CEPIC involved representatives from both associations into the dialogue processes.

Morning Session on Nanotechnology in Coatings

The morning session on coatings was introduced by three stakeholder key notes from public authorities, NGOs and academia to address latest developments, open questions and expectations towards a dialogue process.

Informational needs and the regulatory frame for consumer applications: The European Commission's View – Dr. Philippe Martin, Principal Administrator, DG Sanco

In the first presentation of the day Philippe Martin started with the Commission's working definition of nanoscaled materials and DG Sanco's focus of interest on medical devices and consumer products. He emphasized that the development of nanotechnologies have to be safe, integrated and responsible so that their application will result in benefits for the EU citizens. To ensure such a development, the EU legislation covers nanotechnologies under several regimes such as REACH, worker protection laws, environmental and

product liability and product safety systems. Philippe Martin recurred to the Commission's Communication on Regulatory Aspects of Nanomaterials (COM(2008)366) which was published just one week before. "Current legislation covers in principle the potential health and environmental risks in relation to nanomaterials" he summarized the Communication.

In order to guarantee the effectiveness of the EU regulation, he addressed several information gaps in regard to scientific knowledge, market surveillance, exposure, hazard and risk assessment. Data generation should rely to criteria of excellence, independence and transparency. EU committees or institutions like SCENIHR, SCCP and EFSA are mandated to work on the main issues of sources and types of nanomaterials, exposure, hazard assessment and risk assessment strategies. Finally, Philippe Martin developed the core question of further dialogue activities:

"Who provides what information to whom for which purpose?"

He identified four tasks for the stakeholders:

- Science: To advance understanding
- Risk assessment: To perform de novo, case-by-case RA using substance specific data
- Industry: Implementation of regulation, to fulfill legal obligations and secure pre-market approval
- To all: Invest in public dialogue to have an informed exchange

For DG Sanco he announced the second Safety for Success Conference on October 2nd-3rd 2008 in Brussels.

Worker's interest and concerns on nanotechnologies – Dr. Pieter Van Broekhuizen, IVAM Amsterdam, Project Coordinator NanoCap

Issues of worker's interests and concerns are at the centre of the EU project NanoCap to which several environmental groups, trade unions and university centres contribute. Pieter van Broekhuizen, project coordination of the NGOs, stressed the main interests of workers in safe workplaces and to apply the precautionary approach in case of lacking data. He requested full compliance with current legislation and the development of responsible nanotechnologies compatible to the environment. The informational needs were addressed as followed:

- Toxicological data for short and long-term adverse effects (pure and "contaminated" substances)
- Information on physical and environmental behaviour of nanomaterials
- Information on exposure (type, amount, exposed workers, ways of exposure like inhalation or skin; exposure during manufacturing, processing, use, waste, cleaning, maintenance)
- Information about effectiveness of control measures
- Information about the companies' (safety) management; incl. occupational physicians and handling perspectives of labour inspectors

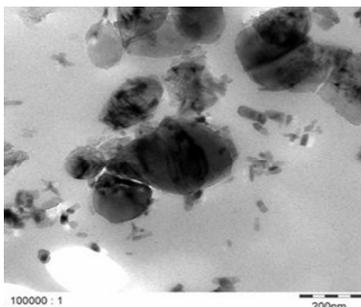
He called for full information about risk related issues, involvement in risk assessment and risk management and an appropriate training. Pieter van Broekhuizen emphasised the application of the precautionary principle (no data → no exposure) over the full life-cycle and demanded Chemical Safety Reports also for nanomaterials < 10tpa (no data → no market). He concluded with a call for complying with codes of conduct for the responsi-

ble use of nanomaterials and transparent ethical considerations concerning product design and development.

Risk Assessment for coating applications – Prof. Dr. Michael Stintz, University of Dresden

Professor Michael Stintz presented first results of a scientific study on the particle release from coatings containing nanoparticles conducted by the University of Dresden for the German Paint Industry Association in 2008 (VdL). The study simulated the typical use of coated materials for architectural, parquet and furniture coatings on wood and metal. 300 rotations of rolling and frictional wheels and a special abrasion grain simulated the scratching moves of sandy shoes of ordinary consumers on a parquet in long term use. The abrasion of the coating with nanoscaled zinc oxide inside and pigment particles (marketed product from Byk Chemicals) was characterized with the help of a sequential mobility

Architectural coating 20 nm zinc oxide and pigment particles



TEM

particle sizer (SMPS), a differential mobility analyzer (DMA) and a condensation particle counter (CPC). The measurement set up is currently under standardization in ISO/TC24/SC4. The results of the tests show that the particle release depends on substrate and coating in use. However, there is no significant correlation of exposure between coatings with or without nanomaterials inside. Furthermore the particle concentration of the nanocoating <100 nm was underneath 1 and therefore too low for statistical certainty. Concluding the results he added that the use of 20 nm Zinc Oxide should not increase a particle release in the nanoscaled through the normal use of sandy shoes.

In the next project phase, Professor Stintz and his group will test the abrasion stress comparable to professional grinding and along the life cycle (seasoned or weathered paints) as well as for a larger number of coatings and nanoparticles.

Industry Example One: Nanotechnology and coatings - Jacques Ragot, Bayer MaterialScience

Test setting for exposure measurement



The presentation started with outlining the areas of nanotechnology in which Bayer MaterialScience is active and describing potential benefits of nanotechnology coatings such as saving energies and resources, reducing environmental impact and improving quality of life. Jacques Ragot then focused on risk assessment and management procedures along the life cycle at Bayer Material Science. He identified key criteria for the exposure in the production phase (in a dispersion or in a closed system); for the application of the coating (brush, roll, flow, spray, cup gun, airless); for the use of the product (abrasion and weathering) and the end of life

(recycling, incineration).

A combination of particle counters and sampling on TEM filter/EDX (non-standard) in parallel with the gravimetric method (standard) were recommended. For the further development and validation of methods Bayer is engaged in several safety research projects

sponsored by the German Federal Ministry for Education and Research (NanoCare, TRACER). Tests on workplace exposure during spraying with nanoparticles showed concentrations similar to background level and not higher than with standard coating systems. Preliminary tests on abrasion of coatings demonstrated that it is unlikely that nanoparticle aerosols are formed arising from mechanical processes. In regard to worker's protection, information was given on the penetration of airborne nanoparticles through protective materials and the efficiency of filters. In both areas standard protection techniques seem to provide adequate safety. Information for technical, organisational and personal protection measures is provided on the homepage of the company (www.baycareonline.com / www.baytubes.com). Jacques Ragot ended with stating that Bayer is committed to ensure the safe use of nanomaterials.

Industry Example Two: Nano-composite façade paints - Carolin Kranz, BASF

Carolin Kranz in the beginning emphasized the importance of nanotechnologies as an innovation driver for BASF. She presented several examples of nanotechnology products available on the market to improve

**Short term inhalation
test equipment BASF**



adhesion (construction materials), energy efficiency (polymers), self-cleaning and dirt resistant effects for textiles or paints, release systems with an improved bioavailability and at least sun protection creams. At the example of the consumer façade paint COL.9 Carolin Kranz explained how BASF communicates the functionality of the product and the benefits of nanotechnology inside. COL.9 combines the positive characteristics of existing dispersion and silicate paints using nanocomposites as a binder which results into a high level of dirt-resistance and durability. BASF committed itself to a voluntary code of conduct for nanotechnologies which covers the protection of employees, customers, business partners and the environment, participation in safety research and commitment to an open dialogue. In line with this code, BASF tested the safety of COL.9 along the life cycle. In regard to workers and customers safety tests were conducted on mutagenicity, skin irritation, acute oral toxicity, aquatic toxicity and short-term inhalation. The results did not reveal any hazards caused by the nanomaterials in use. On the issue of environmental safety, abrasion trials were conducted. Again, the tests did not show any additional release of nanoparticles into the environment. As a result, BASF considers the façade paint COL.9 to be safe. Carolin Kranz end up with a view upon the research projects BASF is taking a part like the American HESI / ILSI Nanomaterials Program, ACC Nanomaterials Voluntary Program, the European NanoSafe 2, CellNanoTox and the German NanoCare. Information and recommendations for the safe use of nanomaterials are available at www.basf.de/dialogue-nanotechnology/safety_research.

Panel Discussion and Dialogue Session on Nanotechnology in Coatings

Facilitation by the Risk Dialogue Foundation – Antje Grobe and Alexander Jäger

The focus of the morning dialogue session was how to create responsible and sustainable innovation in the field of nanotechnology coatings. Two key questions were asked to the speakers and later to the audience:

- *What makes you confident in the product's safety of a coating application?*
- *What kind of information has to be shared?*

In the panel discussion with Antje Grobe, Philippe Martin stressed that information needs independence to be trusted. Therefore he recommended talking about peer reviewed processes based on excellence and transparency to build up a pool of information as a source for stakeholders and consumers. Pieter van Boekhuizen added that companies should rely on the precautionary principle if there are any gaps of knowledge and that workers will insist on more information on occupational health and environmental safety. This would include training modules. He mentioned the problem of different levels of knowledge between SMEs and the presenting large companies like BASF and Bayer Material Science. As an example for the cooperation between SMEs, their association and a University Michael Stinz referred to his research project on the abrasion of coatings. Asked from Antje Grobe he gave some insights of the standardization process and that science and the ISO Committee /Working Groups expect to finalize these efforts in the next two years. For industry Carolin Kranz and Jacques Ragot pointed out that this period of time industry is investing a lot in implementing REACH and an ongoing dialogue with regulators about industries experience with certain measurement methods. When discussing the need for a trusted system for sharing information, industry proposed that considerations should include the balance between transparency on the one hand and protection of intellectual property on the other. It also suggested that clarity is needed on what information should be provided to whom, in what detail, and in what form.

With this question Antje Grobe introduced the audience dialogue session within mixed table groups. After a working phase of twenty minutes the facilitation team gathered the opinions from the groups and summarized the results in a real-time protocol regarding the two morning questions (Order of appearance is changed regard to the questions).

**What makes you confident in the product's safety of a coating application?
What kind of information has to be shared (and how)?**

Comments and recommendations of the stakeholders about how to gain confidence in product's safety

- There is still reluctance within industry to share information – especially regarding food and cosmetic applications. The **implementation of Voluntary Codes** could be a first step towards more transparency and trust in industry.
- Companies should **pro-actively provide safety dossiers** with information about risk assessment measures regarding the case-by-case approach. They should not respond only when demanded.
- If there is a product in the market someone has to state whether it is safe or not. Problems: there are different stakeholders in the value chain. Stakeholder should commonly work on **standardized risk assessment methods** and a **set of criteria to define what is "safe" in the different phases of the value chain**.
- The perspective of the **consumer is missing** in this initializing dialogue.

- Risk assessment and risk management may be carried out by industry for the products on the market. However, for the most products there is no **easy access to information** on risk assessment. Industry has to improve this.
- Press highlights the negative aspects of nanotechnology. There is no “**objective**” **information** available. The question is “Who” could be a reliable, trusted source of information.
- Confidence depends on the information (results, methods, standardized tests, ...) and the provider. Industry is not trusted in and even regulatory institutions are not completely independent. Therefore all stakeholders should work on an **independent, institutionalized system / framework to gain trusted information including the different perspectives and concerns**.

Comments and recommendations for the information exchange

- The information needed depends on the stakeholders you ask. Therefore **different information packages with targeted levels of information** have to be tied up.
- **More data on potential exposure** is needed to inform workers and consumers.
- **Safety Data Sheets** are an important tool to assure the responsible use of nanomaterials along the value chain. Industry should take high priority on their performance.
- **Regulatory forms** for industry should be **less bureaucratic** and ask relevant, clear questions. The **objectives** as well as criteria for **the quality and sufficiency of data have to be defined**. Lorry-loads of data serve no purpose unless they respond to a clear question.
- Lessons learned: **Existing risk management processes have to be communicated** to the stakeholders.
- Regulatory frame does exist – this makes stakeholders confident in the technology – **current regulation has to be communicated in a better way – it is still unknown**.
- The current debate concentrates on the risk. The **positive potential** of the technologies is not emphasized sufficiently.

Summarizing the session Antje Grobe concluded that all stakeholder groups expressed the need for an adequate system that ensures trust, reduces uncertainty and involves all the stakeholders with their different perspectives. For the question of “who, what and how” there may be not only one golden formula but the need for differentiation and a better understanding of the different stakeholders concerns.

Afternoon Session on Environmental Technologies

Expectations on nanotechnologies for the environment: The European Commission’s View

- Peter Gammeltoft, Director of DG Environment, Unit D.2

Peter Gammeltoft welcomed that CEFIC organizes a dialogue with a clear focus on risks. He stated the importance to exchange views on risks and benefits and to communicate between industry, authorities and civil society in order to ensure that nano-applications are improving the environment in tandem with the development of a response to potential risks.

The overall goal of Europe's environmental policy is to ensure a high level of environmental protection for the citizens of Europe. However, the responsible use of nanotechnologies can help to boost eco-innovations in various sectors, he stated. Europe's eco-industries make up one third of the global market. These industries already have a total expenditure of €200 billion - which is over 2% of the EU's GDP - and the sector has experienced annual growth of around 5%. Exports had a trade surplus of over €600 million last year. The message hence is that today's investment can and has to help both the economic and environmental benefit. Climate change, a disappearing natural world, health damaging pollution and increasingly scarce resources have become areas of highest priority in the last years. "The message is clear", Peter Gammeltoft concluded, "To ensure European leadership in the future we need to plan and to invest right now. Done rightly, it presents business opportunities and can also help get us out of the environmental predicament in which we find ourselves."

The European Commission supports these efforts by generally supporting nanotechnology research activities in the 6th and 7th Research Framework Programme.

Research on safety aspects is seen as being of high relevance especially since as technological development is perceived to progress faster than the ability to develop new safety test guidelines. In the end, Mr. Gammeltoft stated that existing legislation does cover nanomaterials in principle. However, knowledge gaps are clearly identified and need to be closed urgently regarding eco-toxicological effects of released nanoparticles if society wants to use the benefits.

Benefits and Risks of nanotechnologies for the environment: A life-cycle approach

- Ineke Malsch, Malsch TechnoValuation, Netherlands

The presentation provided an insight into the mission and activities of the European ObservatoryNano Project which was started on the first of April 2008. Ineke Malsch coordinates the Work package 4 on ethical and societal issues of nanotechnologies and talked about perceived benefits and risks. To deal with risk issues she suggests taking a proactionary approach. She clearly addressed the different information requirements of the stakeholders as a result of her work as a consultant and project coordinator for different societal groups. Informational needs:

Trade Unions:

- Exposure at work
- Protection against potential risks

Environmental Organisations:

- Potential exposure scenarios of the environment, plants and animals during the whole life cycle
- Realistic potential for remediation, monitoring and resource efficiency

Consumers:

- Labelling products with nano-inside (freedom of choice)
- Adequacy of safety measures
- Benefits of the product (more attractive/better/cheaper than alternatives)

Parliaments:

- Common standards and terminology for nanotechnology
- Addressing knowledge gaps and questions of financing research
- Sufficiency of regulation and authorities' equipment for monitoring and control

Developing countries and emerging economies:

- Access to industrial and western government expertise (incl. occupational health)

- Potential contributions of environmental nanotechnology to sustainable development and improved resource efficiency (Meridian Institute, USA)
- Investment in R&D and innovation in developing countries

Ineke Malsch concluded her presentation with sketching possibilities of exchange between the societal groups such as public dialogues organized by neutral organisations, responding to questions from societal groups and governments (e.g. DEFRA voluntary submission scheme) or to contribute to projects such as the ObservatoryNano Project.

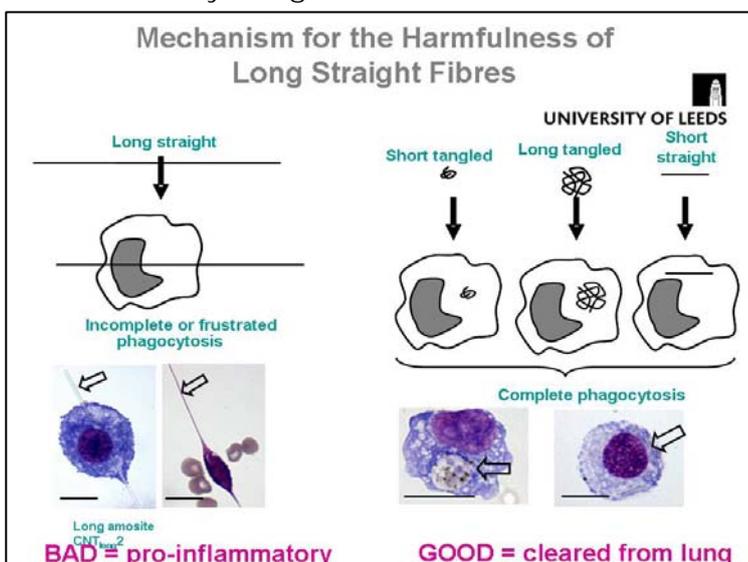
Research on Nanotechnologies for the Environment

- Terry Wilkins, University of Leeds, CEO NanoManufacturing Institute (NMI)

Starting with an overview on the funding for research in Europe, Prof. Wilkins showed that the number of projects on health effects of nanoparticles increased significantly in the recent years. Terry Wilkins addressed interdisciplinary science research skills needed for toxicology studies of new nanomaterials which are carried out by NanoManufacturing Institute at the University of Leeds and their partners:

- Materials Characterisation (size, shape & chemical properties)
- Data mining & QSAR
- Cell membrane penetration
- DNA damage (free radical & oxidative damage)
- Intra-cell interactions (inc mutagenicity)
- Whole organ effects
- Whole organism effects
- Clinical studies
- Environmental impacts
- E, H & S monitoring tools (sensors & high-throughput systems)

Leeds was one of the first Universities (UK Health & Safety Executive's study) measuring exposure of scientists and found out that the "*biggest contribution to nanoparticles in our laboratories' atmosphere was from traffic exhausts from road outside.*" Currently, the research is still facing challenges of measurement (e.g. background exposure level) and standardization (e.g. reference materials). Amongst others, the NMI leads projects on an integrated Data Mining Tool Box, on Lipid Bilayer Sensors and new methods to assess DNA damage in lung epithelial cells, skin epithelial cells or gut cells. Another project is focussing mutation assays for germ cells.



To demonstrate the difficulties in research and communication with the wider public Prof. Wilkins went into detail on the recent study of Poland et al. (2008) that analyzed the pathogenicity of carbon nanotubes and showed parallels to asbestos-like hazards for CNTs with a comparable long straight fibre shape. The study of Professor Ken Donaldson's team also delivered data on short tangled, long tangled and short straight fibres and found

them cleared by complete phagocytosis in the lung. However, media summarized the article by the simple sentence "Nano is like asbestos". Research is at an early stage and much more needs to be done to ensure an evidence-based public debate. Terry Wilkins closed with a call for more interdisciplinary research and the need to learn from the best practice of the past to earn our 'License to Operate' in the future.

Example One: Carbon Nanotubes (CNTs) and eco-efficiency

- André Lecloux, Nanocyl

Nanocyl, a Belgian SME and spin-off of the Universities of Namur and of Liège, is today one of the leading producers of carbon nanotubes in Europe with a proactive participation in toxicological studies.

Prof. André Lecloux started his speech introducing the example of conductive compounds with multi-walled carbon nanotubes (short tangled). He presented data on the improved mechanical/conductivity balance compared to other fillers which can result in a weight reduction of 5-15 % and consequently a significant material saving.

CNT display additional characteristics such as high mechanical strength which allow the production of thinner parts with the same properties. This results in a weight reduction of ca. 10-20 % compared to other fillers. When applied in the automotive sector, CNT technology could achieve a global reduction of about 1MT of fuel consumption. Similarly, when applied to aircrafts, CNT technology would lead to a significant kerosene saving.

After quantifying the benefits, Prof. Lecloux talked about the identification of potential hazards and underlined Nanocyl's cooperation with research centres and its participation in different EU research projects. Tests carried out according to the OECD protocols showed no acute dermal toxicity, no *in vitro* mutagenicity and no *in vitro* cytotoxicity of the materials in use. In addition, an *in vivo* inhalation study (90 days) will be completed soon.

The exposure assessment studies showed that only a small fraction of carbon nanotubes can be inhaled. Currently, Nanocyl is engaged in a project on measuring particle size distributions with a university-based research company. As long as there is still the possibility of health risks, Nanocyl is minimising the exposure of workers by producing in closed processes, using appropriate protection equipment and ventilation and providing a code of conduct to its customers. According to André Lecloux, Nanocyl's investment in different stakeholder projects on nano risks issues demonstrates its willingness to contribute in a transparent way to the responsible use of nanotubes and their potential benefits for the environment.

Example Two: Anti-reflective glass coatings

- Patrick Vrijaldenhoven, DSM

The nanotechnology research of DSM currently covers areas such as optical coatings and hydrophilic coatings. Patrick Vrijaldenhoven, a researcher working with nanomaterials every day, focused on anti-reflective nanotechnology glass coatings which have been developed over the last three years. They are applied with success as "invisible" picture glass but the main future potential is expected for solar cell applications. The refractive index of the glass surface is lowered by a coating made up of nanoscaled silica particles (glass) and air. The result is a glass coating with a close to optimal refractive index that reflects only up to 1% of the incoming light (compared to a normal glass surface that re-

flects 8%). When applied to the coating of solar cells, this technology allows to increase the energy output by 4-6%.

Following the description of production and functional aspects, Patrick Vrijaldenhoven showed results of tests at the research facilities which focused on the exposure from solid particles and dispersions of fumed silica. The tests detected no difference in particle concentration from the background signal in the laboratories. In a scenario close to the production process, it was tested whether during the dipping of the glass in the coating material there is any likelihood of dermal exposure. The results revealed that the emission and deposition of materials is very unlikely to occur and that a transfer is only possible if the fumed silica on the glass are not completely dried. Additional tests done on a voluntary base at DSM analysed the effect of scratching the covered glass surfaces. It was shown that with cured glass it is not possible to remove the coating. With uncured glass it is possible to remove flakes of the coating but the concentration of nanosize particles is not higher than in a reference sample of a pure solvent. At the end of his presentation, Patrick Vrijaldenhoven described how in regard to the unknowns left in the risk assessment of nanotechnologies DSM tries to minimise exposure levels. For example, there are no application techniques like spray-coating, only suspended, not dry particles are used, safety protection clothing is used in the laboratories and operators in the plants are not exposed to uncured coatings.

Panel Discussion and Dialogue Session

- Facilitation by the Risk Dialog Foundation – Antje Grobe and Alexander Jäger

In the panel discussion Peter Gammeltoft stressed the importance of sustainable innovation for the environment and to do this in a responsible way according to the current legislation. The next step forward could be to accelerate the debate on societal and ecological needs on the one hand and on Voluntary Codes of Conduct for the responsible production on the other. For Ineke Malsch the most important next step would be to include more societal groups in the dialogue process – which were not very well represented in numbers - and to integrate the perspective of the developing countries. With Terry Wilkins the moderator Antje Grobe deepened the case of the CNT study and the simplifying media perception. Terry Wilkins emphasized the need for more interdisciplinary exchange and recommended to communicate in a balanced and more differentiated way. For the SMEs Andre Lecloux pointed out that nanotechnologies offer interesting development opportunities and underscored the potential environmental benefits which should balance the risks debate. Patrick Vrijaldenhoven expressed that the priorities to work on for DSM are to provide solutions for beneficial application – for consumers and the environment. For him personally as a researcher working with these materials that includes high standard safety measures. A next step should be to communicate experiences and to share information about functionality and safety.

The participants worked again in their table groups with mixed stakeholders according to the same questions like the panelists:

What are the priorities to work on environmental benefits of nanotechnologies?

What are the next steps towards an integrated dialogue?

The facilitation team again presented the results to the participants in a real-time protocol.

Comments and recommendations for priorities on environmental benefits:

- The first priority is to **try to solve environmental challenges without creating others**. A holistic assessment is needed.
- The technology is only second. Most important are the questions and challenges raised, the technology only can be one solution.
- **Define your environmental goals** and then talk about how to solve them and how nanotechnologies can contribute.
- Beneficial products will contribute to **resource efficiency, energy storage, water purification, waste and pesticides** and help to achieve the **millennium goals**.
- Important benefits have to contribute to the challenge of **climate change**
- The priority should be to **communicate benefits and risks** of nanotechnologies a balanced way. Environmental technologies could be a good example.
- There needs to be a **risk analysis in each area** of applications – that includes environmental technologies.
- The discussed **risk management efforts could be difficult for SMEs** to join – they need help (possibly from the EU-regulators)

Comments and recommendations for next steps:

- In general there are too many scattered dialogue efforts. There is a need for **coordinated dialogue activities** to save resources from the stakeholders.
- **EU-level and national dialogues need to be coordinated** and information needs to be exchanged. Cefic could take an active part on this.
- A **higher representation of civil society groups** (health NGOs, consumer NGOs, ..) is needed at the workshop to avoid the technological gridlock. (CEFIC's reply: they have been invited but unfortunately did not attend all)
- Cefic should **clarify the objectives of the dialogue process**, define what the benefits for the participants are and define its own commitment.
- The dialogue seems to be more an "orchestrated debate" with a hidden motive to achieve acceptance. Industry has to **open up dialogue and assure safety** for health, environment and future generations.
- For the next stakeholder dialogue it is recommended to **communicate the questions to the stakeholders in advance**.
- There is always the **same small number of companies** who engage with stakeholder. What are about the others?
- There is **too much industry in the room**, the audience is not balanced and that hinders dialogue.
- **SMEs should be integrated in a better way** for the next step - not only the well known big ones.
- The next step should be **to work in smaller circles** where people know each other and define common ground and following activities.

Next Steps and comments by Cefic

- Executive Director, Product Stewardship, **Lena Perenius**

The purpose of the meeting was to discuss how to foster the responsible development of sustainable innovations based on nanotechnologies and how to achieve greater transparency and engagement with civil society.

This first stakeholder engagement workshop was an opportunity for Cefic to demonstrate its commitment to work with stakeholders to find the best ways of sharing appropriate information in appropriate ways. Chemical companies gave a detailed account of four real-life nano-enabled products in coatings and environmental technologies applications, sharing openly concrete information on use, exposure, risk assessment and benefits across the life-cycle.

Cefic will take up the suggestions made during this first stakeholder engagement workshop and continue follow-up consultations with its stakeholders during the rest of 2008 so that, by the end of 2008, Cefic will present proposals for a more focussed engagement during 2009

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