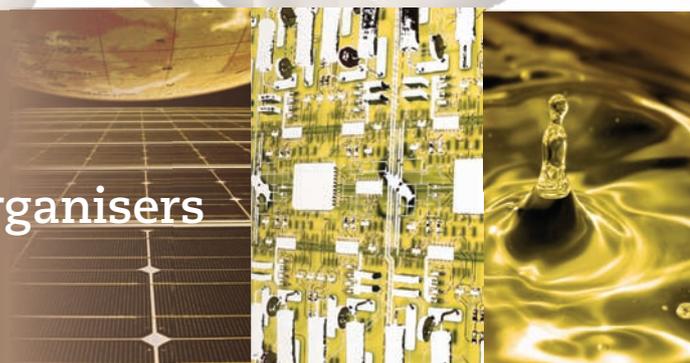


# OECD Conference on Potential Environmental Benefits of Nanotechnology: Fostering Safe Innovation-Led Growth

15-17 July 2009,  
OECD Conference Centre, Paris - France



Guidance for Speakers,  
Moderators and Session Organisers



ORGANISATION FOR ECONOMIC  
CO-OPERATION AND DEVELOPMENT

## Guidance for Speakers, Moderators and Workshop Organisers

The workshop moderators will be responsible, with the organisers and the rapporteurs, for ensuring that the focus of each workshop is clear to participants and maintained throughout. The speakers and participants will be asked to concentrate on a number of questions and issues. Rapporteurs, working with the moderator, will be responsible for drawing the main conclusions of each workshop, ensuring that the questions (see below) are answered and the issues are responded to as fully as possible.

Each workshop in the parallel sessions will be structured in accordance to the following aspects to explore and discuss the pre-eminent perspectives within each field:

- State-of-art technology (the state of the art of one or more nanotechnologies applicable to the sector);
- Potential environmental benefits (of using the technology);
- Potential human health and environmental safety concerns and issues (i.e. challenges for implementation); and
- Policy considerations (i.e. policy measures to address the challenges in the application of nanotechnology for environmental benefit);

A set of questions has been identified, to be addressed in each workshop, but it should not be taken as being complete – while all the questions should be addressed, others may be added. The questions for each of the four aspects above are now considered in turn:

### *i. State-of- Art Technologies*

The unique and potentially useful properties of nanomaterials include dramatically increased surface areas and reactivities, improved strength-to-weight ratios, increased electrical conductivity, and changes in colour and opacity. Materials designed to take advantage of these properties are finding application in a variety of areas, such as electronics, medicine, and environmental protection. To fully realise the potential of these new properties, the technologies supporting and surrounding these materials must, in some cases, also be modified or re-invented. To maximise societal benefits, resources dedicated to competing technologies should be evaluated in terms of potential future of development, current and future costs, as well as external factors such as environmental benefits and risks to human health or the environment.

Workshop questions for state-of-the-art technologies include:

- What is/ are the nanotechnologies of relevance to this sector or for this application (e.g. energy)?
- How are they being/ can they be applied in this sector?
- What are the most promising technological developments in the pipeline in this area?
- What is the potential for each of these technologies to realise further environmental benefits and minimise potential human health and environmental safety concerns and issues?
- What are the non-nanotechnological developments of relevance to this sector and how do nanotechnological opportunities compare to these?

## **ii. Potential Environmental Benefits**

The environmental benefits that could flow from advances in nanotechnology include reducing the impacts of technology on the environment when compared to other technologies throughout the lifecycle. This conference will include a focus on three major areas of environmental benefits:

- Energy and Resource Efficiency – Processes or products that use less energy and fewer raw materials
- Products – Products that are less toxic, less polluting, and wear-resistant; and
- Processes – Processes that are more efficient and waste-reducing.

Workshop questions for potential environmental benefits include:

- What is the environmental benefit? Is it measurable?
- Who are the beneficiaries?
- What opportunities exist to further enhance environmental benefit (e.g., finding ways to more cleanly or efficiently produce the nanomaterial)?
- What barriers exist (e.g., lack of knowledge of nanomaterial properties) to enhancing benefits, mitigating risks?
- How can we capture innovation in nanotechnology for environmental benefits?
- What suggestions are there for a path forward to such benefits?

## **iii. Potential Human Health and Environmental Safety Concerns and Impacts: Challenges**

While nanomaterials have beneficial applications, they also raise concerns over potential implications for human health and the environment. Bioaccumulation potential, toxicity, worker and community exposure, and the ultimate fate of the materials are among the concerns that merit consideration. The pursuit of environmentally beneficial applications of nanotechnology should be undertaken with consideration of the potential impacts across the entire life cycle of the nanomaterials, including production, use, and end-of-life disposal. A broad consideration of the benefits and potential impacts can help to ensure that economic and environmental benefits are maximised, while minimising the likelihood of unintended adverse consequences.

Workshop questions for potential human health and environmental safety concerns and issues include:

- Given life cycle considerations for application of the nanomaterial, what is (or are) the most important, compelling, or interesting exposure scenarios that must be addressed?
- What data are needed to conduct a comprehensive exposure assessment for this scenario?
- What data are currently available, what are the data gaps, and what are the obstacles to collecting the additional data?

## **iv. Policy Considerations**

Work on sustainability and life cycle aspects of materials and components routinely examines potential environmental impacts at major life-cycle stages such as raw material extraction/acquisition; material processing, product manufacture, product use, and final disposition/end-of-life. Future advances in this field may enable the integration of human health concerns and environmental benefits into the sustainability assessments. This ideal holistic view

remains in the developmental stages. However, by examining the many competing factors within the life cycle of products (including the stages of research and development) it is hoped to provide policymakers with usable information to begin developing policies that prioritise resources and address emerging issues in a timely manner. The conference will explore the deployment of policy tools to achieve these ends.

Workshop questions for a framework and policies to evaluate and address these factors together include:

- What policies and drivers are in place to promote or hinder development of the overall application or specific technologies associated with application?
- How do the policies propose to capture and measure environmental benefits?
- How do the policies address potential human health and environmental safety concerns and issues?
- How can we best act in cognisance of the environmental health and safety concerns?
- How do other factors such as job creation, obtaining financing, or patent law, affect the formulation of policies for this application or development of technologies?
- Are the policies technology-neutral and aim to maximise societal benefit or do they pre-ordain specific technological solutions?
- What are the perceived and actual risks associated with the technologies?
- What are the challenges in bringing this technology to the market with the aim of achieving environmental benefits?
- How can these challenges be addressed and by whom? What are the policy tools to address them?

Each workshop organiser, moderator and rapporteur is asked to work with participants to focus on and report back to the plenary session concentrating on the four aspects under consideration:

- State-of-art technology;
- Potential environmental benefits;
- Concerns and issues (i.e. challenges for implementation); and
- Policy considerations.

[www.oecd.org/nanobenefits](http://www.oecd.org/nanobenefits)